Alhamzah Alnoor
Khaw Khai Wah
Azizul Hassan   *Editors*

Artificial Neural Networks and Structural Equation Modeling

Marketing and Consumer Research Applications

Springer

Artificial Neural Networks and Structural Equation Modeling

Alhamzah Alnoor · Khaw Khai Wah ·
Azizul Hassan
Editors

Artificial Neural Networks and Structural Equation Modeling

Marketing and Consumer Research Applications

Editors
Alhamzah Alnoor
Southern Technical University
Management Technical College
Basra, Iraq

Khaw Khai Wah
School of Management
Universiti Sains Malaysia
Pulau Pinang, Malaysia

Azizul Hassan
Tourism Consultants Network
The Tourism Society
London, UK

Contents

List of Figures

Green Practices in Marketing

Social Responsibility in Marketing

List of Tables

Artificial Neural Network and Structural Equation Modeling Techniques: Social Commerce

Artificial Neural Network and Structural Equation Modeling Techniques

Ali Shakir Zaidan and Arash Arianpoor

1 Introduction

At the end of the 1990s, applied business research was presented by (Khan et al., 2019). As a result, Structural Equation Modeling (SEM) has rapidly grown as a comprehensive, adaptable, and incredibly important statistical tool. It is an easy-to-apply second generation analytical multivariate approach that yields high-quality statistical results. According to Hair et al. (2017), there are two versions of SEM, the first is SEM that adopts covariance (CB-SEM) and the second is the Least Squares Structural Equation Modeling (PLS-SEM) method. CB-SEM uses exploratory research and confirmation to prove a well-created theory or interpretation, while PLS-SEM uses both confirmatory research and exploratory research. The PLS-SEM technique is advanced to the CB-SEM technique in terms of predictive accuracy in causal explanations. PLS-SEM is an important technique in social research (Kalinić et al., 2021). Researchers have confirmed the effectiveness of PLS-SEM in addressing difficult problems that CB-SEM cannot solve (Foo et al., 2018). The most common tool used by PLS-SEM is SmartPLS for assessing conceptual foundations with one or more variables of the dependent variables.

Furthermore, PLS-SEM has a wide range of applications as it is a useful method for explaining causal relationships and for formulating and testing hypotheses (Islam et al., 2020). In addition, the main reason for using PLS-SEM is its predictive benefits such as R2 values (the coefficient of determination) and Q2 values (predictive significance) according to the high potential of the PLS-SEM method for solving academic

A. S. Zaidan
School of Management, Universiti Sains Malaysia, 11800 Pulau Pinang, Malaysia
e-mail: sha3883@student.usm.my

A. Arianpoor (✉)
Faculty of Administrative Sciences, Accounting Department, Imam Reza International University, Mashhad, Iran
e-mail: arash.arianpoor@imamreza.ac.ir

and industrial problems. A new direction of research is to predict significant factors using the double stage model of SEM and ANN, as the SEM method cannot explore the nonlinear relationship between constructs (Talwar et al., 2021; Li et al., 2019). The purpose of the emerging SEM with ANN is to describe the non-compensatory and nonlinear interaction between constraints (Binsawad, 2020). Specifically, the ANN technology is based on the algorithm's black box process, which serves as the basis for prediction. ANN can capture both nonlinear and linear connections between variables, which leads to additional accurate findings. This contributes to each model variable, overcoming the limitations of MRA, SEM, and logistic analysis. However, ANN analysis is insufficient to test hypotheses due to its reliance on black box (Hew et al., 2017).

Therefore, the ANN is described as a circular continuous processor that contains processing units to store experimental data with a nervous situation and make it easy to use. In addition, the ANN method categorizes and validates relevant prediction models (Lee et al., 2016). However, several researchers have conducted comprehensive evaluations of the literature on the application of PLS-SEM in the hospitality and marketing sectors. Although these assessments are necessary to ensure research practices, they do not evaluate studies that used techniques combined with the PLS-SEM method (e.g., the ANN method) (Khan et al., 2019). As a result, the amount of literature combining SEM and ANN has increased, but the different types of research cases linking SEM and ANN are still unclear and require further investigation. This systematic analysis aims to support the authors in recognizing current choices and providing relevant insights into the SEM and ANN contexts and research gaps in this area.

2 Methodology

This investigation was performed in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria (Fig. 1). PRISMA advocates using numerous databases rather than a single database to locate relevant articles. This is due to the fact that a single database may not contain all pertinent work. PRISMA provides access to various databases, facilitating a comprehensive literature search.

2.1 Information Sources

In this, we gathered data from four major databases, including Scopus, Science Direct, The IEEE Xplore, and Web of Science (WOS). The first provides access to a variety of study publications in the natural and social sciences, while the second
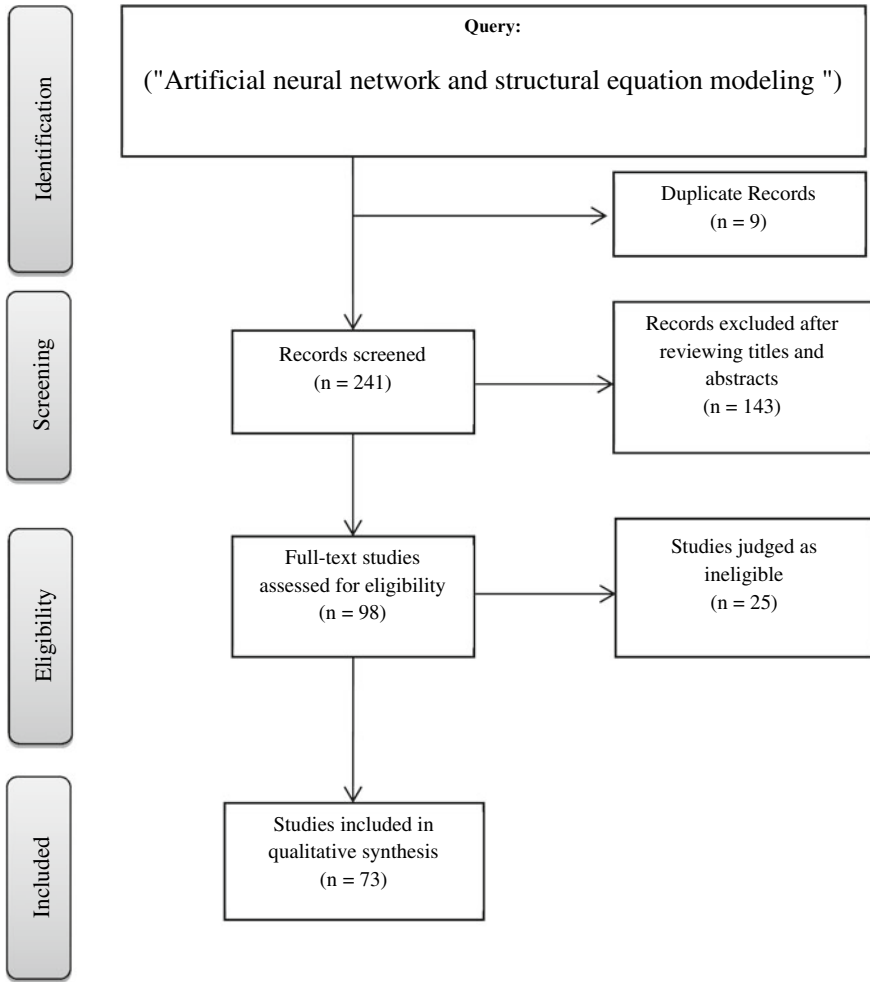
Fig. 1 Review protocol

provides access to technological research. Similarly, IEEE Xplore contains engineering and technology-related research publications, and then, WoS provides access to multidisciplinary research in the fields of science, arts, and humanities.

2.2 Study Selection

To find relevant articles, we initially scoured the aforementioned four databases for a variety of articles. Then, by reviewing the titles and abstracts, we eliminated the

duplicate and less relevant study articles. In the subsequent phase, we read the entirety of the articles chosen in the previous phase and then select the most pertinent ones. Thus, all six authors participated in the initial phase, although only five authors read and filtered the whole text.

2.3 Search Strategy

We searched the four databases using a variety of prominent keywords, such as artificial neural networks and structural equation modeling, to discover the pertinent literature. Our search was restricted to the most current journal articles and conference proceedings, excluding book chapters, reports, etc. It is assumed that journal articles and conference proceedings include the most current and relevant research.

2.4 Eligibility Criteria

We included every article that matched the predetermined criteria. Originally, we planned to divide SEM-ANN investigations into two categories: general and coarse-grained taxonomy. During the first phase of research selection, these two categories were derived from a literature review. The selection of relevant publications was based on a three-point criterion. The first is that it is research published in a journal or conference, the second is that it employs SEM-ANN modeling methodologies, and the third is that it is published in English.

3 Results and Discussion

The initial search returned n = 253 papers for articles published between 2016 and April 2022, including six papers from IEEE Xplore, 61 papers from ScienceDirect, 123 papers from Scopus, and 63 papers from WOS. According to our inclusion criteria, the number of papers kept was decreased to 73 after the exclusion of articles outside the scope of the study. The 73 publications were analyzed from theoretical perspectives, and taxonomy findings were achieved.

3.1 Crisis

This section describes crisis potential for emergency management. Crisis arises when the essential value or life-supporting system of a community is under risk. These values may include security, safety, health, and finances. Hence, many previous

studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Islam et al. (2020), sharing news during crisis is considered a critical issue. Therefore, the impact of personal attributes and motivational factors on influence of social media fatigue were investigated based on SEM and ANN analysis.

However, there is relationship between financial attitude and financial behavior during pandemics such as COVID-19 (Paranita and Agustinus, 2021). According to Talwar et al. (2021), financial behavior influences the financial attitude of retail investors during pandemics such as COVID-19. Financial attitude is considered a critical issue for the retail investors during pandemics such as COVID-19.

Additionally, mobile social media is considered as vital factor to achieve potential for emergency management (Zhao and Liu, 2008). According to Li et al. (2019), mobile social media use intention in emergencies during pandemics such as COVID-19 is considered a critical issue for their penetration into the daily life of humans. The results of the study found an accurate understanding of the intent to use social media via mobile phone in emergency situations with the main predictors except for information sharing.

3.2   Organizational Theory

This section describes organizational politics and workplace victimization. Workplace victimization is seen as a major social stressor with serious implications for individual and organizational politics (Tawiah and Annor, 2017). Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Abubakar et al. (2017), the impact of favoritism/nepotism, supervisor incivility on employee cynicism, and work withdrawal is considered a critical issue within organization. Therefore, the effect of employee cynicism and employees productive on influence of organizational politics and workplace victimization were examined based on SEM and ANN analysis. However, this part explains road accident occurrence. Road accident occurrence is an important subject in road safety research, especially for future transportation organizational and policy decision-making processes (Schlögl, 2020). Consequently, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Dadashova et al. (2016), any harm caused by traffic accidents is always undesirable in terms of health, property, and economic issues. Thus, the impact of road accident occurrence and road safety from the organizational side was investigated based on SEM and ANN analysis. Moreover, several studies describe mHealth apps. Mobile health (mHealth) applications are software programs that operate on mobile devices, such as tablets and smartphones, are applied to manage wellness and health (Tarricone et al., 2021). Mobile health systems are utilized to improve patients' health and well-being in addition to helping doctors and patients communicate (Alam et al., 2021; Zapata et al., 2015). According to Alam et al. (2020), mHealth apps are being used to increase the quality of life for patients. Therefore, the impact of mHealth apps adoption intention and technology adoption on actual usage behavior and behavioral

intention of mHealth apps among technology prone young generation were investigated based on SEM and ANN analysis. Though, this part describes social networking sites. Globally, social networking sites (SNSs), mainly Facebook, have made a significant change into the learning process and teaching in the universities and institutions. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Tiruwa et al. (2018), sharing knowledge and information by social networking sites (SNSs), particularly Facebook, is considered a critical issue. Therefore, the influence of collaborative learning by the students and the intention to use Facebook for higher academics were investigated based on SEM and ANN analysis. Total quality management (TQM) is considered as vital factor to improve organizational performance. TQM has played a crucial part in the evolution of modern management. Quality considered a major strategic aspect in establishing corporate success is more important than ever in order to successfully compete on the global market in the present day. Hence, many previous studies discussed such a concept by combining SEM with ANN to analyze a number of propositions and hypotheses. According to Sila and Walczak (2017), total quality management (TQM) is considered a significant issue in fit using multiple methods and context performance. Therefore, the impact of industry type and company size has influence on some of the TQM practices and TQM-performance relationships.

3.3   Prediction

This unit describes predicted depiction of the cause-and-effect network of connections in the lagoon ecosystem. The use of novelty method as a strategy for predicting transformations in the structure of linkages within forecasting changes and ecosystems in the impact of certain ecological elements is regarded as a fundamental component of ecological excellence. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Kruk et al. (2020), the adoption of the structure and prediction of ecosystem network are considered as vital issues. Therefore, the impact of physical factors, wind speed, and salinity were investigated based on SEM and ANN analysis. However, several scholars describe implementation of the electronics logistics information system in healthcare industry. The use of logistics information systems (LIS) is seen as a crucial element in achieving logistics excellence. These types of information systems assist businesses to maximize their logistics costs, customer service levels, and the fundamental dimensions of logistics performance (Barbosa and Musetti, 2010). Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Kunnapapdeelert and Pitchayade-janant (2020), adoption of the electronics logistics information system in healthcare industry is considered a key issue. Therefore, the impact of behavioral intention to adopt e-logistics information system by healthcare workers, motivational factors, and performance expectancy was investigated based on SEM and ANN analysis.

However, many researchers justify management student's motivation to adopt m-learning. Management student's motivation to adopt m-learning is the acquisition of all knowledge and skills through the use of mobile technologies anywhere and at any time (Liu et al., 2010). Therefore, many previous studies examined such a concept by conducting hybrid or dual approach SEM and ANN. According to Shukla (2021), motivation to adopt m-learning is considered a vital issue. Thus, the impact of the behavioral intent of m-learning adoption on student's motivation to adopt m-learning was investigated based on SEM and ANN analysis. According to Jamil et al. (2017), the energy system is described as one of the renewable energies (RE) technologies that may be deployed rapidly is solar power systems. Therefore, many previous studies examined such a concept by conducting hybrid or dual approach SEM and ANN. Government subsidies are the major incentive that helps investors overcome the early risk of new technology investment (Parsad et al., 2020).

3.4 Perception

This section explains the relationship between business performance of the organization and integration of supply chain. The most important aspect of operational organization performance is supplier integration, followed by client incorporation, production flexibility, internal integration, on-time delivery, and product quality. According to Raut et al. (2018a, b), supply chain is considered a critical issue to the decision-makers of this domain. Therefore, the impact of the incorporation of supply chain on organizational business performance was examined based on SEM and ANN analysis. However, this unit describes how SMS advertising is perceived. SMS promotion refers to the transmission of advertisements in the form of text-based messages via mobile phones. Consequently, several earlier researches have examined this issue using a hybrid or dual technique of SEM and ANN. According to Sharma et al. (2021), sharing advertising on mobile phones is a pressing concern. Based on SEM and ANN analysis, the effect of advertising campaigns employing mobile-based SMS service commercials on customer purchase intent was explored. However, researchers describe smartphone users as frequently changing their devices. Smartphone users tend to prefer to replace their devices frequently due to rapid technological and brand loyalty and scientific advancements (Filieri and Lin, 2017). Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Hew et al. (2017), smartphones users changing is considered a critical issue in modern market. Therefore, the factors that influence consumers repurchase intention of smartphone brands were investigated based on SEM and ANN analysis. However, this reflects mobile social tourism shopping. Mobile social tourism shopping refers to the usage of mobile social tourism platforms to purchase travel-related goods and services. According to Hew et al. (2018) mobile social tourism shopping is considered a critical issue among tourists. Previous literature used the hybrid approach of SEM and ANN to investigate the determinants and antecedents ofshopping intent in mobile social tourism. This part explains the

formation path of customer engagement. In recent years, customer involvement as a major loyalty driver has become a watchword in marketing and the virtual brand community (Bergel and Brock, 2019). Thus, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Song et al. (2020), the formation path of consumer involvement in a virtual brand community with customer interaction, which examines the non-transactional behaviors of customers, has gained favor in the marketing business. Therefore, the impact of interactivity, information quality, and convenience on customer engagement was investigated based on SEM and ANN analysis.

3.5   Trust

However, researchers describe the trust in this section. Due to more uncertainty, the issue of trust is more crucial in e-commerce transactions than in traditional commerce transactions (Kim, 2014). Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Leong et al. (2020a, b, c), trust plays a vital role in the sustainability of e-commerce transactions. By adopting the compensatory relationships approach, it has been shown that information support and income influence the social presence of communication with sellers and trust in advertisements. Additionally, this section describes trust in advertising. The importance of trust in online advertising derives from the fact that if people mistrust online advertisements, their efficiency would be considerably decreased. Currently, people have a low level of trust in online advertising. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Leong et al. (2020a, b, c), the most important antecedent of trust is reliability, which is followed by website quality, willingness to rely on, hours spent, and reputation. Therefore, the impact of trust in online advertising and service providers was investigated based on SEM and ANN analysis. Several scholars describe mobile commerce industry. Mobile commerce industry is defined as any type of mobile communication between the seller and the buyer (Yeh and Li, 2009). According to Kalinić et al. (2021), sharing goods and services in mobile commerce is considered a critical issue in modern trade. Therefore, the impact of trust and mobility factors on consumer satisfaction in mobile commerce was investigated based on SEM and ANN analysis.

3.6   UTAUT Model

This section describes smart meters. Smart meters define a process for achieving sustainable development, energy efficiency, and the potential for enhancing the dependability, quality, and efficiency of power delivery. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and

ANN. According to Alkawsi et al. (2021), smart meters are considered a critical concern in power delivery. Therefore, the impact of eco-effective feedback and technology awareness factors on influence of distribution of electrical power supply and storage and sale were investigated based on SEM and ANN analysis. Thus, this section describe mobile applications. Mobile applications are becoming an increasingly popular method of delivering government services, allowing citizens to get more convenient and prompt services. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Sharma et al. (2018), service is considered a critical issue via mobile applications to the government sector and individual. The literature that adopted such a hybrid approach revealed that trust and expected performance affect the implementation and adoption of smart governance applications. This part explains adoption of contact tracing apps. Contact tracing applications can help to mitigate and prevent the spread of epidemics, diseases, crimes, and accidents by speeding up reporting and contact tracing processes through improved digital data flow, proximity tracking, and geolocation tracking (Akinbi et al., 2021). According to Duan and Deng, (2021) sharing information via tracing apps during crisis and dilemma is considered a critical issue. Therefore, the impact of social influence and perceived value of information disclosure on the influence of adopting contact tracing apps were investigated based on SEM and ANN analysis. In addition, this part refers to cryptocurrency. Cryptocurrency is a digital money that uses sophisticated encryption techniques to conduct a variety of financial transactions. Using blockchain, cryptocurrency transactions aim to provide security, transparency, and anonymity. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Abbasi et al. (2021), the use of cryptocurrencies such as bitcoins enables consumers to avoid traditional commercial payment procedures. Therefore, the impact of price value and performance expectancy factors on influence of personal innovativeness were investigated based on SEM and ANN analysis. Several scholars have explained consumers' acceptance of behavioral targeting advertising and technology acceptance model. Growth in market size and enhancements to the mobile ecosystem give the opportunity for advertisers to engage in targeted advertising, which is regarded as a successful and valuable approach for reaching the target demographic. Hence, many previous studies discussed such an idea by conducting hybrid or dual approach SEM and ANN. According to Wang et al. (2022) as an alternative to conventional advertising, focused advertising is more effective at brand development and consumer acquisition while reducing expenses. Therefore, the impact of personal attributes and advertising, and motivational factors on influence of social media and IT were investigated based on SEM and ANN analysis.

3.7 Logistics

This section describes green supply chain management. Companies have used their GSCM to improve their core competitive advantage as environmental preservation

is becoming more widely recognized around the world. GSCM comprises green production, green purchasing, green packaging, and green marketing green distribution. The objective of GSCM is to remove or reduce solid, hazardous, chemical, energy, and emission waste (Jayant and Azhar, 2014). Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Foo et al. (2018), green supply chain management is considered a critical issue. Therefore, the impact of GSCM practices and sustainability performance on influence of supplier assessment and supplier choice were investigated based on SEM and ANN analysis. However, this section describes adoption for operations and supply chain management. Supply chain performance factors include quality, dependability, speed, cost, risk reduction, flexibility, and sustainability. Modern supply chains are multi-echelon, geographically dispersed enterprises competing to service consumers. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN (Wong et al., 2020). Therefore, the impact of competitive pressure, regulatory support, market dynamics, upper management support, cost, relative advantage, and complexity factors on influence of block chain adoption for operations and supply chain management were investigated based on SEM and ANN analysis.

3.8 Mobile Payment

This part describes peer-to-peer mobile payment. Peer-to-peer mobile payment defines to complete transaction between firms and customers. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Kalinic et al. (2019), the perceived utility of P2PM-pay is the most influential factor in consumers' decisions to adopt this revolutionary technology. Using a cell phone to make payments instead of cash, credit cards, or cheques is becoming increasingly popular in our culture. Therefore, the impact of perceived trust and social norms on development and implementation of P2PM-pay systems were investigated based on SEM and ANN analysis. However, numerous researchers describe mobile wallet. Mobile wallets define as a new innovative method for electronic financial payments instead of using traditional payment methods as a process to complete transaction between firms and customers. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Leong et al. (2020a, b, c), the application of the mobile wallet has been made possible by mobile technology, which is a significant concern. Therefore, the impact of perceived novelty on m-wallet innovation resistance and effects of education, usage barrier, income, and risk barrier were investigated based on SEM and ANN analysis. On the other hand, this part describes smartphone credit card. Smartphone credit card (SCC) is an innovative method of payment that utilizes NFC-enabled cellphones. The location-based payment method enables customers to pay for goods and services by waving their cellphones in front of an NFC scanner (Ooi and Tan, 2016). Hence, many previous studies discussed such a concept by

conducting hybrid or dual approach SEM and ANN. According to Chang and Song (2016) smartphone credit card is considered a significant issue in individuals' behavior. Therefore, the impact of mobile ease of use and mobile technology acceptance model on the mobile usefulness were investigated based on SEM and ANN analysis. This section describes mobile payment. Mobile payment is defined as a transaction method between businesses and customers. Consequently, several earlier researches have examined this issue using a hybrid or dual technique of SEM and ANN. According to Liébana et al. (2018; 2021), the interest in mobile payments is a crucial concern. Perceived security and perceived benefit are the most important determinants of mobile payment use. This section describes mobile banking. Mobile banking (m-banking) has developed rapidly over the years because of the customers' greater usage of mobile technologies, their ever-changing lifestyle preferences, and several economic variables. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Sharma and Sharma (2019), mobile banking is considered a critical issue to the costumer and banks during crisis. Therefore, the impact of intention and satisfaction factors on influence of service quality, information quality, and trust were examined based on SEM and ANN analysis. This paragraph describes m-wallets. M-wallets are more convenient and efficient than conventional payment methods since they eliminate the need for cash. According to Rehman et al. (2019), m-wallet is considered a critical issue because it provides convenience, personal innovativeness trust, and security to examine the factors of consumers' intention-to-use m-wallets. The impact of security and convenience factors on influence of consumers' intention were explored based on SEM and ANN analysis. Finally, this section describes mobile payment. Mobile payments during a pandemic are more useful and convenient than traditional payment systems because the use of traditional payment systems may expose users to health risks due to the spread of the epidemic. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Loh et al. (2022), sharing payments in midst of the pandemic is considered a critical issue to the costumer. The impact of sources of technostress and price savings factors on continuance intention were investigated based on SEM and ANN analysis.

3.9 Social Commerce

This section describes mobile social commerce business. Social commerce is a type of social media that can facilitate user-generated content and social interaction to support consumers in making purchasing decisions and acquiring information about goods and services via mobile. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Alnoor et al. (2022), customer trust for social commerce businesses is considered a critical issue. Therefore, the impact of presence, social support, and trust in social commerce was studied based on SEM and ANN analysis. However, Khaw et al. (2022) discuss mobile commerce. Mobile commerce can become the main method

of transaction for many people. Mobile devices especially smart phones lead to better display and higher levels of use of these devices in commercial activities, which is called mobile commerce and e-commerce (Liébana et al., 2017. This technique is regarded creative for the financial wallet, but it comes with some drawbacks. Therefore, the impact of trust in customer involvement, customer trust, customization, and mobility factors on influence of spread of m-commerce adoption around the globe were investigated based on SEM and ANN analysis. Though, this section explains social media (Facebook). Social media has an important chance in the cognitive choice of learning in a student's life. Recent advances in technology and knowledge from advances in social networking services have brought great importance to the collaborative nature of learning in people's lives, thus supporting a constructivist social approach. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Sharma et al. (2016), sharing teaching and learning via Facebook is considered a critical issue. Therefore, the impact of perceived usefulness, perceived enjoyment, resource sharing and motivational factors on influence of social media were examined based on SEM and ANN analysis. However, this part discusses customers' brand attitudes. In addition, qualitative characteristics might help service providers comprehend consumers' brand attitudes by allowing them to focus on the most significant components rather than reading the entire review. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Ray et al. (2021), sentiment is the most significant predictor of brand attitudes. Word of mouth, feelings, and emotions influence customers' attitudes toward the brand. However, many researchers describe wearable payment. As a result of technology improvements, a variety of smart wearable devices, including smartwatches, wristbands, fitness trackers, eyewear, rings, key chains, and even coats, have emerged (Jee and Sohn, 2015). Wearable payment is the use of a smart wearable device that is physically connected to the user (e.g., rings, wrist bands, smartwatches, etc.) to purchase goods and services anywhere and at any time (Bezhovski, 2016; Lee et al., 2020). The impact of behavioral intention and mobile ease of use factors on influence of convincing the potential adopters to adopt wearable payment is investigated based on SEM and ANN analysis. While this part describes social media marketing. The introduction of new information and communication technologies, especially the Internet and social networks, has altered market dynamics and consumer spending, posing a challenge to the competitive positions of businesses, and enhancing the purchasing power of consumers. Hence, many previous studies argued such a concept by conducting hybrid or dual approach SEM and ANN. The results suggested that perceived cost, top management support, perceived competition pressure, perceived relative advantage, and perceived vendor pressure have a significant impact on social media marketing adoption.

3.10 Wearable Technology

This section describes wearable healthcare technology. Wearable healthcare technology refers to the incorporation of intelligent electronic components into various sorts of body-worn items. Examples include the Samsung Gear, Fitbit, and Apple Watch (Wright and Keith, 2014; Asadi et al., 2019). Many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Talukder et al. (2020), wearable healthcare technology has a significant effect on the well-being of society's people, as it enables users to continuously monitor physiological indicators and health outcomes, which is important for tracking and transforming users' health information. Therefore, the impact of performance expectancy and social influence, functional congruence, and motivation factors on influence of adoption of wearable healthcare technology were investigated based on SEM and ANN analysis. In addition, the rising demand for and use of wearable technology have enabled various parties to access physical activity and medical data independent of time or place. Smartwatches are a critical concern in the medical industry and are useful for transmitting information between doctors and patients (Almarzouqi et al., 2022).

3.11 Technology Acceptance

This section describes customer relationship management (CRM). A social CRM approach is a new type of CRM that is powered by social media technologies and provides a better way to manage customer interactions. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Ahani et al. (2017), customer relationship management is considered a critical issue in social media technology. The impact of top management support, IT knowledge of employee, information sharing, cost, competitive pressure, information capture, and compatibility factors on influence of adoption of social customer relationship management were examined based on SEM and ANN analysis. However, according to Zabukovšek et al. (2019), this part describes enterprise resource planning (ERP). ERP systems are the software tools used to manage all corporate data and offer information to those who require it at the appropriate time. These systems enable corporations to manage their supply chain, which includes receiving, client order management, inventory management, production planning and shipping, management, accounting, and human resource management, among several other tasks that occur in modern corporations. Therefore, the impact of technology acceptance model and enterprise resource planning factors was studied based on SEM and ANN analysis. Lee et al. (2016) discuss the concept of knowledge management. Knowledge management (KM) plays a significant role in the global economy and is becoming increasingly critical for the competitiveness of large and medium-sized businesses, according to a massive body of research. Previous studies discussed such a concept

by conducting hybrid or dual approach SEM and ANN. KM in SMEs is considered a critical issue unlike large firms. Therefore, the impact of competitive advantage and technological innovation on influence of knowledge management practices were investigated based on SEM and ANN analysis. However, several scholars describe information technologies and green information technology. The importance of information technologies in business is growing and has become an integral element of economic and social life and enhances the overall organization's environmental sustainability (Asadi et al., 2021). It is impossible to imagine a business without information technology, and it is crucial not just to discover information, but also to find the quickest and most trustworthy information. Previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. Information technologies anticipated that the successful application of information technology will have substantial positive implications on the performance of businesses and to the decision-makers and policymakers (Camero and Alba, 2019). According to Songkram and Chootongchai (2022), information technology is considered a critical issue in education system. The impact of information technology usage levels, ascription of responsibility, managerial interpretation, and business performance were investigated based on SEM and ANN analysis.

3.12   Cloud Computing

This section describes cloud computing technology. Cloud computing has become a vital aspect of the IT industry and innovation in numerous forms. The term cloud is used to refer to a variety of distributed computing platforms, such as a cluster of servers, cluster of servers, network, interface, and software, that users require to complete specified activities. The term computing refers to the provision of this package as a service that users may employ as consumers choose appropriate (Ooi et al., 2018; Raut et al., 2018a, b). Hence, previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. The impact of firm performance, firm size, top management support, absorptive capacity, and performance expectancy on influence of innovativeness were investigated based on SEM and ANN analysis.

3.13   Sustainability

This part explains food rescue organizations. Food rescue organizations are non-profit organizations that help alleviate hunger by rescuing excess food from various food producers and redistributing it to welfare agencies that support various forms of food relief. Previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Nair et al. (2018), food provider and welfare agency is considered a critical issue in the food relief operations. The impact of delivery operations and food rescue on influence of food providers and surplus food

were investigated based on SEM and ANN analysis. However, several researchers describe eutrophication in freshwater. Eutrophication is one of the most challenging environmental problems surface water systems are currently facing (Bhagowati and Ahamad, 2019). Eutrophication is the ecological process through which a body of water gets increasingly enriched with essential nutrients for aquatic plants, leading to an increase in the photosynthesis rate and primary productivity of the aquatic environment. Previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Li et al. (2017), freshwater is considered a critical issue in the people's life. Therefore, the impact of hydraulic gradient and temperature factors on influence of chlorophyll were examined based on SEM and ANN analysis. While this part explains big data analytics and sustainable practices, sustainability practices can be defined as a shift in company strategies and operations toward meeting the demands of businesses and stakeholders while also sustaining, maintaining, and improving human and natural resources that will be required in the future. Big data analytics is an increasingly popular topic in academia and business. Companies are putting in place the necessary technologies, people, and procedures to capitalize on the opportunities presented by this data. Utilizing analytics is essential to extracting value from huge data (Raut et al., 2019). Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. The impact of supplier integration, state and central-government policy, internal business process, consumer incorporation leadership and management style on the big data analytics and sustainable practices were investigated based on SEM and ANN analysis. Researchers discuss conservative agriculture practices. Unsustainable agricultural practices are weak and costly compared to conservative agricultural practices that adopt sustainable agricultural performance. The old agricultural practices have poor performance. Sustainable agricultural practices are a new way to save time, effort, and cost for farmers and government. Conservative and sustainable practices are also beneficial to the soil, the environment, fertilizer distribution methods, and modern irrigation methods. According to Hayat et al. (2020), conservative agriculture practice is considered a critical issue in the agriculture sectors of developing and developed countries. Therefore, the impact of environment attitude and profit orientation on influence of farmers' trust were investigated based on SEM and ANN analysis. Also, eco-innovation is described as the superior use of resources to reduce negative effects on the environment and the development of new business-beneficial goods (Hermosilla et al., 2010). The literature describes eco-innovation as a set of innovations that mitigate negative environmental impacts. Previous studies discussed such a notion by conducting hybrid or dual approach SEM and ANN. According to Siaw et al. (2022), company can improve its social performance by investing in R&D for eco-innovations, implementing novel green management techniques, and educating its employees about eco-innovation. The impact of technological advancements, changing demand, and intense market competition on eco-innovations effect on the sustainability of business performance were investigated based on SEM and ANN analysis. This portion describes corporate social responsibility. CSR is one of the earliest and most essential notions in the academic study of the relationships between business and society. Literature discussed such a concept

by conducting hybrid or dual approach SEM and ANN. According to Binsawad (2020), corporate social responsibility (CSR) has emerged as a critical component of an organization's ability to compete. The impact of CSR factors such as society-oriented, market-oriented, and CSR activities and workforce oriented on influence of increased competitiveness in firms were investigated based on SEM and ANN analysis. There is a relationship between environment management and consumer participation. Nonetheless, this section explores consumer participation in environmental management. It is essential for environmental management that customers are involved in reverse logistics. Although it is a manufacturer's extended responsibility to manage waste, by becoming the supplier of end-of-life products, customers must be encouraged to participate (Najmi et al., 2021). This sustainability encompasses not only environmentally compatible operations from the extraction of raw materials to the delivery of the final product to consumers, but also waste management at the end of the product's life (Najmi et al., 2021). Thus, the role of consumers in recycling programs of end-of-life product was investigated based on SEM and ANN analysis. Finally, several scholars describe eating behavior. Recent research indicates that behavioral elements, including eating behavior pattern, emotional eating behavior, body design concern, and body esteem, are the most influential causes of weight increase and fat. According to Kheirollahpour et al. (2020), eating behavior risk factors is considered a critical issue in the body health. The impact of body appreciation scale and body shape concern on the healthy and unhealthy eating behavior patterns were investigated based on SEM and ANN analysis.

4 Conclusion

A systematic review was conducted of 73 studies that applied SEM and ANN approaches in order to capture linear and nonlinear relationships. The literature varied and discussed different issues. However, much of the literature has focused on marketing issues such as online purchase intentions, wearable technology, and technology acceptance. In addition, the previous literature discussed the issues and determinants of sustainability. However, there is a huge dearth of studying many topics related to transportation, tourism, and strategic studies. Therefore, the future literature should focus on such topics to identify the important determinants that contribute to enriching the literature and provide guidance to practitioners.

References

Abbasi GA, Tiew LY, Tang J, Goh YN, Thurasamy R (2021) The adoption of cryptocurrency as a disruptive force: Deep learning-based dual stage structural equation modelling and artificial neural network analysis. PLoS ONE 16(3):e0247582

Abubakar AM, Namin BH, Harazneh I, Arasli H, Tunç T (2017) Does gender moderates the relationship between favoritism/nepotism, supervisor incivility, cynicism and workplace withdrawal: A neural network and SEM approach. Tourism Management Perspectives 23:129–139

Ahani A, Rahim NZA, Nilashi M (2017) Forecasting social CRM adoption in SMEs: A combined SEM-neural network method. Comput Hum Behav 75:560–578

Akinbi A, Forshaw M, Blinkhorn V (2021) Contact tracing apps for the COVID-19 pandemic: a systematic literature review of challenges and future directions for neo-liberal societies. Health Information Science and Systems 9(1):1–15

Alam MMD, Alam MZ, Rahman SA, Taghizadeh SK (2021) Factors influencing mHealth adoption and its impact on mental well-being during COVID-19 pandemic: A SEM-ANN approach. J Biomed Inform 116:103722

Alam MZ, Hu W, Kaium MA, Hoque MR, Alam MMD (2020) Understanding the determinants of mHealth apps adoption in Bangladesh: A SEM-Neural network approach. Technol Soc 61. https://doi.org/101255

Ali G, Abdul Rahim NF, Wu H, Iranmanesh M, Keong BNC (2022) Determinants of SME's Social Media Marketing Adoption: Competitive Industry as a Moderator. Sage Open 12(1). https://doi.org/10.1177/21582440211067220

Alkawsi GA, Ali N, Mustafa AS, Baashar Y, Alhussian H, Alkahtani A, … & Ekanayake J (2021). A hybrid SEM-neural network method for identifying acceptance factors of the smart meters in Malaysia: Challenges perspective. Alex Eng J, 60(1):227–240.

Almarzouqi A, Aburayya A, Salloum SA (2022). Determinants of intention to use medical smartwatch-based dual-stage SEM-ANN analysis. Inform Med Unlocked, 28(1):1–12.

Alnoor A, Al-Abrrow H, Al Halbusi, H, Khaw, KW, Chew X, Al-Maatoq M, & Alharbi RK (2022). Uncovering the antecedents of trust in social commerce: an application of the non-linear artificial neural network approach. Competitiveness Review: Int Bus J.

Amponsah-Tawiah K, Annor F (2017) Do personality and organizational politics predict workplace victimization? A study among Ghanaian employees. Saf Health Work 8(1):72–76

Asadi S, Abdullah R, Safaei M, & Nazir S (2019). An integrated SEM-Neural Network approach for predicting determinants of adoption of wearable healthcare devices. Mob Inf Syst, 2019.

Asadi S, Nilashi M, Samad S, Rupani PF, Kamyab H, Abdullah R (2021) A proposed adoption model for green IT in manufacturing industries. J Clean Prod 297:126629

Barbosa DH, & Musetti MA (2010) Logistics information systems adoption: an empirical investigation in Brazil. Ind Manag Data Syst.

Bergel M, Brock C (2019) Visitors' loyalty and price perceptions: The role of customer engagement. Serv Ind J 39(7–8):575–589

Bezovski Z (2016) The future of the mobile payment as electronic payment system. European Journal of Business and Management 8(8):127–132

Bhagowati B, Ahamad KU (2019) A review on lake eutrophication dynamics and recent developments in lake modeling. Ecohydrol Hydrobiol 19(1):155–166

Binsawad MH (2020) Corporate social responsibility in higher education: a PLS-SEM neural network approach. IEEE Access 8:29125–29131

Camero A, & Alba E (2019) Smart City and information Technology: A Review. Cities, 93, 84–94.

Chang S, Lu T, & Song H (2016, December) Smartdog: Real-time detection of smartphone theft. In 2016 IEEE International Conference on Internet of Things (iThings) and IEEE Green Computing and Communications (GreenCom) and IEEE Cyber, Physical and Social Computing (CPSCom) and IEEE Smart Data (SmartData) (pp. 223–228). IEEE.

Duan SX, & Deng H (2021) Hybrid analysis for understanding contact tracing apps adoption. Ind Manag Data Syst.

Filieri R, Lin Z (2017) The role of aesthetic, cultural, utilitarian and branding factors in young Chinese consumers' repurchase intention of smartphone brands. Comput Hum Behav 67:139–150

Foo PY, Lee VH, Tan GWH, Ooi KB (2018) A gateway to realising sustainability performance via green supply chain management practices: A PLS–ANN approach. Expert Syst Appl 107:1–14

Hayat N, Al A, Nasir NAM, Selvachandran G, Nawi NBC, Gai QS (2020) Predicting sustainable farm performance—using hybrid structural equation modelling with an artificial neural network approach. Land 9(9):289

Hew JJ, Badaruddin MNBA, Moorthy MK (2017) Crafting a smartphone repurchase decision making process: Do brand attachment and gender matter? Telematics Inform 34(4):34–56

Hew JJ, Leong LY, Tan GWH, Lee VH, Ooi KB (2018) Mobile social tourism shopping: A dual-stage analysis of a multi-mediation model. Tour Manage 66:121–139

Hidayat I, Alzahrani S, Rehman MZ, Akhter F (2022) Determining the factors of m-wallets adoption. A Twofold SEM-ANN Approach. Plos One 17(1):e0262954

Islam AN, Laato S, Talukder S, Sutinen E (2020) Misinformation sharing and social media fatigue during COVID-19: An affordance and cognitive load perspective. Technol Forecast Soc Chang 159:120201

Jamil WJ, Rahman HA, Shaari S, Salam Z (2017) Performance degradation of photovoltaic power system: Review on mitigation methods. Renew Sustain Energy Rev 67:876–891

Jayant A, Azhar M (2014) Analysis of the barriers for implementing green supply chain management (GSCM) practices: an interpretive structural modeling (ISM) approach. Procedia Engineering 97:2157–2166

Jee SJ, Sohn SY (2015) Patent network based conjoint analysis for wearable device. Technol Forecast Soc Chang 101:338–346

Kalinić Z, Marinković V, Kalinić L, Liébana-Cabanillas F (2021) Neural network modeling of consumer satisfaction in mobile commerce: an empirical analysis. Expert Syst Appl 175:114803

Kalinic Z, Marinkovic V, Molinillo S, Liébana-Cabanillas F (2019) A multi-analytical approach to peer-to-peer mobile payment acceptance prediction. J Retail Consum Serv 49:143–153

Khaw KW, Alnoor A, Al-Abrrow H, Chew X, Sadaa AM, Abbas S, & Khattak ZZ (2022) Modelling and evaluating trust in mobile commerce: a hybrid three stage Fuzzy Delphi, structural equation modeling, and neural network approach. Int J Hum.–Comput Interac, 1–17.

Kheirollahpour MM, Danaee MM, Merican AFA, & Shariff AAA (2020) Prediction of the influential factors on eating behaviors: a hybrid model of structural equation modelling-artificial neural networks. Sci World J, 2020.

Kim DJ (2014) A study of the multilevel and dynamic nature of trust in e-commerce from a cross-stage perspective. Int J Electron Commer 19(1):11–64

Kruk M, Paturej E, Artiemjew P (2020) From explanatory to predictive network modeling of relationships among ecological indicators in the shallow temperate lagoon. Ecol Ind 117:106637

Kunnapapdeelert S, Pitchayadejanant K (2020) Hybrid SEM-neural networks for predicting electronics logistics information system adoption in Thailand healthcare supply chain. International Journal of Business Performance and Supply Chain Modelling 11(1):54–68

Larbi-Siaw O, Xuhua H, Owusu E, Owusu-Agyeman A, Fulgence BE, Frimpong SA (2022) Eco-innovation, sustainable business performance and market turbulence moderation in emerging economies. Technol Soc 68:101899

Lee VH, Foo ATL, Leong LY, Ooi KB (2016) Can competitive advantage be achieved through knowledge management? A case study on SMEs. Expert Syst Appl 65:136–151

Lee VH, Hew JJ, Leong LY, Tan GWH, Ooi KB (2020) Wearable payment: A deep learning-based dual-stage SEM-ANN analysis. Expert Syst Appl 157:113477

Leong LY, Hew TS, Ooi KB, Chong AYL (2020a) Predicting the antecedents of trust in social commerce–A hybrid structural equation modeling with neural network approach. J Bus Res 110:24–40

Leong LY, Hew TS, Ooi KB, Dwivedi YK (2020b) Predicting trust in online advertising with an SEM-artificial neural network approach. Expert Syst Appl 162:113849

Leong LY, Hew TS, Ooi KB, Wei J (2020c) Predicting mobile wallet resistance: A two-staged structural equation modeling-artificial neural network approach. Int J Inf Manage 51:102047

Li X, Gao Z, Chen Z, Zeng G, León T, Liang J, … & Chen R (2017). Eutrophication research of Dongting Lake: an integrated ML-SEM with neural network approach. Int J Environ Pollut, 62(1), 31-52.

Li Y, Yang S, Zhang S, Zhang W (2019) Mobile social media use intention in emergencies among Gen Y in China: An integrative framework of gratifications, task-technology fit, and media dependency. Telematics Inform 42:101244

Liébana-Cabanillas F, Marinković V, Kalinić Z (2017) A SEM-neural network approach for predicting antecedents of m-commerce acceptance. Int J Inf Manage 37(2):14–24

Liébana-Cabanillas F, Marinkovic V, de Luna IR, Kalinic Z (2018) Predicting the determinants of mobile payment acceptance: A hybrid SEM-neural network approach. Technol Forecast Soc Chang 129:117–130

Liébana-Cabanillas F, Singh N, Kalinic Z, Carvajal E (2021) Examining the determinants of continuance intention to use and the moderating effect of the gender and age of users of NFC mobile payments: A multi-analytical approach. Inf Technol Manage 22(2):133–161

Liu Y, Li H, Carlsson C (2010) Factors driving the adoption of m-learning: An empirical study. Comput Educ 55(3):1211–1219

Loh XM, Lee VH, Hew TS, & Lin B (2022) The cognitive-affective nexus on mobile payment continuance intention during the COVID-19 pandemic. Int J Bank Mark.

Luna Cortés G, Royo M (2013) The antecedents of consumers' negative attitudes toward SMS advertising: A theoretical framework and empirical study. J Interact Advert 13(2):109–117

Nair DJ, Grzybowska H, Fu Y, Dixit VV (2018) Scheduling and routing models for food rescue and delivery operations. Socioecon Plann Sci 63:18–32

Najmi A, Kanapathy K, Aziz AA (2021) Exploring consumer participation in environment management: Findings from two-staged structural equation modelling-artificial neural network approach. Corp Soc Responsib Environ Manag 28(1):184–195

Ng FZX, Yap HY, Tan GWH, Lo PS, Ooi KB (2022) Fashion shopping on the go: A Dual-stage predictive-analytics SEM-ANN analysis on usage behaviour, experience response and cross-category usage. J Retail Consum Serv 65:102851

Ooi KB, Tan GWH (2016) Mobile technology acceptance model: An investigation using mobile users to explore smartphone credit card. Expert Syst Appl 59:33–46

Ooi KB, Lee VH, Tan GWH, Hew TS, Hew JJ (2018) Cloud computing in manufacturing: The next industrial revolution in Malaysia? Expert Syst Appl 93:376–394

Paranita ES, & Agustinus M (2021, March) The Influence of Investment Motivation and Financial Literacy on Interest in Investing During the COVID-19 Pandemic. In Proceedings of the 3rd International Conference on Banking, Accounting, Management and Economics (ICOBAME 2020) (Vol. 169, pp. 299–303).

Parsad, C., Mittal, S., & Krishnankutty, R. (2020) A study on the factors affecting household solar adoption in Kerala, India. International J Product Perform Manag.

Raut RD, Mangla SK, Narwane VS, Gardas BB, Priyadarshinee P, Narkhede BE (2019) Linking big data analytics and operational sustainability practices for sustainable business management. J Clean Prod 224:10–24

Raut RD, Priyadarshinee P, Gardas BB, Jha MK (2018a) Analyzing the factors influencing cloud computing adoption using three stage hybrid SEM-ANN-ISM (SEANIS) approach. Technol Forecast Soc Chang 134:98–123

Raut R, Priyadarshinee P, Gardas BB, Narkhede BE, & Nehete R (2018b) The incident effects of supply chain and cloud computing integration on the business performance: an integrated SEM-ANN approach. Benchmarking: Int J.

Ray A, Bala PK, Rana NP (2021) Exploring the drivers of customers' brand attitudes of online travel agency services: A text-mining based approach. J Bus Res 128:391–404

ŞAHİN H, (2018) Impact of information technology on business performance: integrated structural equation modeling and artificial neural network approach. Scientia Iranica 25(3):1272–1280

Schlögl M (2020) A multivariate analysis of environmental effects on road accident occurrence using a balanced bagging approach. Accid Anal Prev 136:105398

Sharma A, Dwivedi YK, Arya V, Siddiqui MQ (2021) Does SMS advertising still have relevance to increase consumer purchase intention? A hybrid PLS-SEM-neural network modelling approach. Comput Hum Behav 124:106919

Sharma SK, Sharma M (2019) Examining the role of trust and quality dimensions in the actual usage of mobile banking services: An empirical investigation. Int J Inf Manage 44:65–75

Sharma SK, Al- A, Rana NP, Al- L (2018) Mobile applications in government services (mG-App) from user's perspectives: A predictive modelling approach. Gov Inf Q 35(4):557–568

Sharma SK, Joshi A, Sharma H (2016) A multi-analytical approach to predict the Facebook usage in higher education. Comput Hum Behav 55:340–353

Shukla S (2021) M-learning adoption of management students': A case of India. Educ Inf Technol 26(1):279–310

Sila I, Walczak S (2017) Universal versus contextual effects on TQM: a triangulation study using neural networks. Production Planning & Control 28(5):367–386

Song M, Qiao L, Law R (2020) Formation path of customer engagement in virtual brand community based on back propagation neural network algorithm. Int J Comput Sci Eng 22(4):454–465

Songkram N, and Chootongchai S (2022) "Adoption model for a hybrid SEM-neural network approach to education as a service," Education Information Technologies, vol. ahead-of-print., no. ahead-of-print., pp. 1–31.

Sternad S, Kalinic Z, Bobek S, Tominc P (2019) SEM–ANN based research of factors' impact on extended use of ERP systems. CEJOR 27(3):703–735

Talukder MS, Sorwar G, Bao Y, Ahmed JU, Palash MAS (2020) Predicting antecedents of wearable healthcare technology acceptance by elderly: A combined SEM-Neural Network approach. Technol Forecast Soc Chang 150:119793

Talwar M, Talwar S, Kaur P, Tripathy N, Dhir A (2021) Has financial attitude impacted the trading activity of retail investors during the COVID-19 pandemic? J Retail Consum Serv 58:102341

Tarricone R, Petracca F, Ciani O, Cucciniello M (2021) Distinguishing features in the assessment of mHealth apps. Expert Rev Pharmacoecon Outcomes Res 21(4):521–526

Tiruwa A, Yadav R, & Suri PK (2018) Modelling Facebook usage for collaborative learning in higher education. J Appl Res High Educ.

Wang G, Tan GWH, Yuan Y, Ooi KB, Dwivedi YK (2022) Revisiting TAM2 in behavioral targeting advertising: a deep learning-based dual-stage SEM-ANN analysis. Technol Forecast Soc Chang 175:121345

Wong LW, Leong LY, Hew JJ, Tan GWH, Ooi KB (2020) Time to seize the digital evolution: Adoption of blockchain in operations and supply chain management among Malaysian SMEs. Int J Inf Manage 52:101997

Wright R, Keith L (2014) Wearable technology: If the tech fits, wear it. Journal of Electronic Resources in Medical Libraries 11(4):204–216

Yeh YS, & Li YM (2009) Building trust in m-commerce: contributions from quality and satisfaction. Online Information Review.

Zapata BC, Fernández-Alemán JL, Idri A, Toval A (2015) Empirical studies on usability of mHealth apps: a systematic literature review. J Med Syst 39(2):1–19

Zhao E, & Liu L (2008, September) China's Generation Y: Understanding the workforce. In *2008 4th IEEE International Conference on Management of Innovation and Technology* (pp. 612–616). IEEE.

Dr. Ali Shakir Zaidan is a lecturer at University of Baghdad in Iraq. He is now a PhD student in business administration at the School of Management, Universiti Sains Malaysia. He is a researcher, who has published research in various journals. He serves as a reviewer for the several journals.

Dr. Arash Arianpoor is assistant Professor of Accounting, Attar Institute of Higher Education, Mashhad, Iran. He received his doctoral degree in business administration. His research interests center on organizational studies.

Determinants of Social Commerce

Nadia A. Atshan and Gadaf Rexhepi

1 Introduction

With the emergence of social commerce, both business and consumers have undergone a significant transformation. Hence, understanding consumer behavior within the scope of social commerce has become increasingly important for firms that seek to leverage their social ties to influence consumers (Zhang and Benyoucef, 2016). Through the adoption of Web 2.0 capabilities, e-commerce is undergoing a transformation that improves customer participation and achieves greater economic value (Bazi et al., 2022).

An important concept in sociology is social support, which measures how individuals feel about being cared for, being responded to, and having support from the people in their social groups (Itliong et al., 2020). To consult their social communities for advice in purchasing decisions, consumers may also use this support to share commercial information with their networks (Dinesh and MuniRaju, 2021). In other words, more social support can lead to better relationship quality, which can lead to a higher level of customer loyalty. As a result of better social support, better relationship quality can lead to higher levels of customer loyalty (Koch et al., 2021).

In this social network marketing approach, brands and consumers are interconnected and connected with no delay, location or limitation in time, as the approach facilitates two-way communication instead of one-way communication (Husnain and Toor, 2017). Mobile devices are increasingly used for sharing information, connecting with social networks, and facilitating the sharing of money and goods. In the mobile age, social media and social commerce are becoming a big part of people's daily lives. With social commerce, people can communicate and form groups in many

N. A. Atshan
Management Technical College, Southern Technical University, Basrah, Iraq

G. Rexhepi (✉)
Southeast European University, Tetovo, North Macedonia
e-mail: g.rexhepi@seeu.edu.mk

different cultural contexts, and technology makes these connected experiences more pervasive and immediate (Li et al., 2021).

In this chapter, we will focus on explaining social commerce and innovation barriers in the beginning, and then in order to clarify theories of social commerce, we will group and explain them starting with social support theory, social network theory, elaboration likelihood model, commitment trust theory, and theory of social presence.

2 Determinant of Social Commerce

In recent years, social commerce has made significant improvements in practice and gained widespread attention in the information systems (IS) discipline (Linda, 2010). In 2006, the term "social commerce" was first used in an academic article; although some studies believe social commerce research dates back to the late 1990s, social commerce has undoubtedly gained widespread attention in the past decade, and the number of social commerce publications has increased dramatically (Liang et al., 2011). Online commerce has evolved into social commerce, which incorporates Web 2.0 and social technologies as well as commercial functionality. SC influences customers' perceptions, preferences, and decisions not only through information presented on e-commerce websites, but also via content generated by people on social networks (Cheng et al., 2019). During the social commerce environment, Web 2.0 shifts market power from companies to customers. Additionally, since customers are relying on these online services and applications for their daily needs, they are seeking more social and interactive ways to engage with them (Cheng et al., 2019). Essentially, social commerce is the employing of web-based social communities by e-commerce firms, focusing on the impact of social influence on consumer interactions (Sharma et al., 2019).

2.1 Innovation Barriers

All companies are concerned about bringing new products to market regularly, and successfully, the empirical research on the failure of innovations points to high failure rates, showing that new products often fail because consumers resist innovation (Matsuo et al., 2018; Rexhepi et al., 2019). Consumers' resistance to innovation is a normal reaction to change, which must be overcome before adoption can begin (Joachim et al., 2018). It is important on what they believe also (Palmer et al., 2021; Sepasi et al., 2021). It may be more productive to study the reasons behind innovation resistance rather than the reasons for adoption, since most consumers are not a priori motivated to change (Chung & Liang, 2020). Among psychological barriers, tradition barriers are mainly associated with the changes that innovation may bring about in daily routines (Mani & Chouk, 2018). Moreover, the image barrier

arises because innovations acquire an identity based on a range of factors, such as the product category, the country of origin, or the brand. Hence, the image barrier is a manifestation of stereotyped thinking and hampers the adoption of an innovation (Mani & Chouk, 2018; Joachim et al., 2018). A usage barrier is a perception barrier resulting from consumers' concern that they may not be able to deploy an innovative product or service smoothly if their existing workflow, practices, and habits do not match the utilization of the innovation. Tradition barrier causes consumer resistance to innovation by deviating from previously perceived concepts, and a value barrier could develop, preventing consumers from adopting the innovative product without sufficient incentives (Chen et al., 2021).

2.2 Social Support Theory

According to the social support definition, perceived social support enhances quality of life and provides a comprehensive understanding of situations by family, friends, and other people (Hu et al., 2019; Yahia et al., 2018). Social support also refers to interactions between individuals in which they receive resources from others (Sheikh et al., 2019), where through social support, people can cope with uncertainty and gain a greater sense of control in their lives (Kautish et al., 2021). Social relations usually provide some conditions, such as reciprocity, and establishment of social bonds which entails a degree of distance from a person's problems. Giving that the information is integral to all resource support systems (Song et al., 2020; Fong et al., 2018), in addition, a number of psychological disciplines have explored the role of social support, including psychology, sociology, and health care.

A company that sells online promotes relationship quality in a variety of ways, including investing in the relationship with the customer, customer relationship management, social support, etc. (Hennig-Thurau, 2000). So, people find support from each other and exchange relevant information primarily for the purpose of socializing (Kozinets et al., 2010), where social support facilitates and influences individuals' purchase decisions through the social interactions they have with each other (Ridings & Gefen, 2004).

2.3 Social Network Theory

Social networks are a systematically effective means of monitoring connectedness and opinion formation in a complex web of interpersonal influences (Tabassum et al., 2018). Social network theory offers marketers valuable insights to develop communication and branding strategies by building up social capital (Delu, 2019), where marketing firms are increasingly using social networking sites as part of an integrated marketing communication strategy, as they provide new channels of interactive communication with consumers (Can & Alatas, 2019) and so a product's customer

experience and use have always been at the forefront of marketing attention, as have user interactions on social media. As people determine their opinions and behaviors, they appropriately consider opinions and behaviors displayed by others, together with other constraints and opportunities (Yamin & Kurt, 2018; Muller & Peres, 2019).

2.4 Elaboration Likelihood Model

Prior to its development, persuasion and its impact on consumer attitudes had been discussed (Griffith et al., 2018). Since 1981, over 125 articles and chapters have been published in the advertising and marketing literature, which is the primary reason for continued use of the ELM (Shi et al., 2018). ELM contends that the extent to which a person is involved in an advertisement determines how he or she forms or changes attitudes toward the product being marketed (Aghakhani et al., 2021), and so explanation refers to how carefully a person thinks about the contents of the messages. The more involved people are in product evaluation, the more likely they are to scrutinize product-related information, so explanation is the key to determining the processing mode taken for forming or changing an attitude (Osatuyi & Hughes, 2018). Thus, an individual's attitude change is likely to last only for a short time and the resulting behavior is unlikely to be predictable.

2.5 Commitment Trust Theory

Customers find that online shopping offers increased access and choices, especially when it comes to product information. Prior to online shopping, customers had little choice when it came to local retailers, banks, travel agents, stockbrokers, insurance agents, and department stores (perhaps restricted to counties, cities, or states) (Balto, 2000). Additionally, social commerce is also growing in popularity, which offers consumers a wide array of options and new sources of information. It is precisely this empowerment of the consumer that would also contribute to the growth of online shopping trust (Malaga, 2001). The foundation of a successful relational exchange, trust plays a pivotal role in the relationship between the seller and the buyer, trust as a multidisciplinary concept, encompassing economics, marketing, sociology, psychology, organizational behavior, strategy, information technology, and decision science (Luo, 2001). Relationships of exchange require trust and commitment, and according to Morgan and Hunt (1994), commitment is a critical component of trust. Therefore, we hypothesize that trust translates into commitment. Trust and commitment comprise our focus. Antecedents that influence trust and commitment are behavioral intentions influenced by these antecedents (Mukherjee & Nath, 2007).

The business-to-business relationship entails an exchange of information and services between two or more parties, and that exchange requires a level of commitment and trust (Friman et al., 2002). When customers commit a business there for a

product or service, they are more likely to ignore new information and resist attempts to convince them that other vendors could offer them a better deal (Thatcher et al., 2004). A party that trusts other behavior is willing to rely on that behavior, especially when that behavior has an impact on the party bestowing trust (Fock et al., 2006).

2.6 Theory of Social Presence

In the field of computer-mediated communication, social presence has attracted considerable attention, as it can help predict how the social characteristics of a communication medium determine users' media choices (Gefen and Straub, 2004). According to this theory, users who perceive high social presence tend to understand online content better and feel more involved than those with low perceptions of social presence (Osei-Frimpong & McLean, 2018). In fact, customers who see human warmth while participating on a Brand Page (high social presence) tend to participate more actively in brand-hosted conversations and influence social commerce in a positive way (Algharabat et al., 2018).

In recent years, social presence has been used as a key explanation of individuals' social practices online. Social presence is viewed as an important factor in the formation of relationships and the exchange of information within a mediated environment; social presence is essential to interaction and learning (Murat & Brett, 2011). The social presence of buyers and sellers motivates them to buy over the Internet, as it leads to a positive connection with customers, thus enhancing social commerce (Lee, 2018).

3 Customers' Intentions of Use Social Commerce

Hajli et al. (2017) defined purchase intention as "Purchase intention indicates likelihood that consumers will plan or be willing to purchase a certain product or service in the future." In an online environment, purchase intention refers to the extent of degree to which a customer is willing to buy online products/services. Studies have found that an increase in purchase intention is the indication of more purchases. Customers with positive purchase intention develop positive brand engagement that results into actual purchases (Zhou et al., 2013). Hamari and Koivisto (2015) argued that purchase intention is necessary to consider while developing a new marketing strategy because it influences the actual purchase decision. They call intention as an important indicator of actual behavior. They further narrated that success of a marketing strategy in an online environment is largely dependent on how well a business understand the customer purchase intentions.

Hamari and Koivisto (2015) argued that purchase intentions have important implication for businesses. Business uses purchase intention as measurement tool to determine the potential success of new distribution mechanism (Lu et al., 2016). This helps

managers to further flourish the proposed distribution channels to reach the distant customers or otherwise. Chen and Shen (2015) discussed that purchase intention is a pre-purchase stage and is closely related to motivational aspects of customers' behavior, thus considered as a major factor to influence purchase decision. Hajli et al. (2017) refer to the extent to which customers demonstrate a specific behavior (purchase behavior). In recent times, e-commerce has been growing at a tremendous pace and online purchase intention has been recognized as major factor in the growth and promotion of the e-commerce. Likewise, the lack of online purchase intention is considered to hurdle this growth (Lu et al., 2016). Another determinant of the online purchase intention is attitude toward the online shopping. According to studies in the field of psychology, attitudes are learned and developed over a period of time and subject to change. Attitudes change when individuals come across new concepts. In an online environment, attitude is considered as an assessment of customers' intent to do online shopping (Hajli et al., 2017). Purchase intention is the outcome of customers' attitude toward certain products and services. More positive attitude means more intention to make actual purchase (Wang & Yu, 2017). This also means that positive assessment of customers' attitude is likely to develop positive intention and results into online purchase.

Bai et al. (2015) discuss the role of subjective norms in the development of purchase intention in case of online store. Subjective norms are closely associated with the customer's perception about the benefits and cost linked to purchase of a product or a service. Hamari and Koivisto (2015) defined subjective norms as a motivation a customer gets from his or her social network to do online purchases. Lu et al. (2016) found subjective norms as a predecessor in online purchase decision because customers are influenced from their close network and are expected to engage in those behavior in which their close networks have been. The more influence the customers has from their close network, there are greater chances to show higher purchase intention. Wang and Yu (2017) identified number of factors which influence customers' purchase intention, especially in online environment. These among other include self-efficacy in online shopping, compatibility with online shopping, and personal innovation in information technology (PIIT).

Some scholars are of the opinion that the concept of self-efficacy has been overlooked in the studies of customers' online purchase intentions (Wang & Yu, 2017). Amaro and Duarte have defined self-efficacy as customers' belief in their own capabilities to effectively use internet to search online the products/services-related information. Customers with lower level of self-efficacy avoid use of internet, whereas customers with higher levels of self-efficacy are likely to engage with the computer devices to go online and show greater purchase intentions. Yuan et al. (2021) defined compatibility with online shopping as "the extent to which a consumer believes that shopping online fits/matches his/her lifestyle, needs, and shopping preference." It has been found that online shopping compatibility has direct relationship with customer's online purchase intentions. This is because those customers find an alignment between their needs, interests, and online purchases. The third important factor is personal innovation in IT. Generally, it refers to the diffusion of innovation and has greater implications for marketing activities. Tew et al. (2022) have defined personal

innovation as the one's (customer) preference for novel and different products and services to gain different usage experience. Personal innovation is a phenomenon that stimulates purchase intention. An earlier definition of PIIT was given by Ng et al. (2022) that it is "the willingness of an individual to try out any new information technology." The concept of PIIT is important to understand technology adoption, and in this case, it is purchase intention and actual purchase behavior. For instance, there is direct relationship between PIIT and behavioral intentions. Other factors which have been identified as key indicators of purchase intention include product price and product advertising.

Consumers make purchase decisions after positive evaluation of product-related information. Peers' evaluation and feedback on a specific product play critical role in creating purchase intentions and actual purchase decision. Apart from the information from peers, other factors that intend customers to make purchases include product/service knowledge, product/service perception, product design and packaging and endorsement from celebrities. Many studies have documented product/service knowledge to play main role in creating purchase intentions (Loh et al., 2021). Similarly, Wan et al. (2021) argued that product packaging has significant influence on customers' purchase intentions. Packing helps create good market image and gives indication of product quality. Relevant celebrity endorsement with effective communication is also pertinent to customers' purchase intentions. Perceived value of a product/service is also an important determining factor to intend customers to make purchase decision. Perceived value includes both tangible and non-tangible benefits to be derived from product usage. A higher perceived value results into more intention to make online purchases.

Mirabi et al. (2015) conducted a study to explore the major factors which influence customers' purchase intention in the context of Iranian customers. They found various important factors which influence purchase intentions. These factors include brand name, product quality, product packaging, product price, and product advertising. Their study argued that because of ever changing and competitive market environment, it has become challenging for firms to attract and retain customers. Customers are more exposed to different factors which help them to make purchase decision, and thus, they do not make purchase decision based on single source information. To continue in the reasonable market and to retain long-term profitable relationship with the customers, vendors need to have a strong knowledge of the factors which impact customer purchase intention and purchase decision making. Analysis of customer's behavior to know their product orientation is very important for companies to secure their respective market share. Therefore, marketing specialists are required to provide a comprehensive marketing program which focuses on the factors causing purchase intentions. Yuan et al. (2021) stated that purchase intention is a decision-making process that is concerned with the factors causing purchase of a specific brand (product or service). Customers' purchase intention is closely related to the customers' behaviors, perception, and attitude toward the brand. Positive behavior, attitude, and perception are linked with higher purchase intentions. Some scholars argue that purchase intention is an effective indicator of brand likeness. Customers' perception of price, quality, and value may cause purchase intention to

change. Studies have documented six important factors which influence customers'
pre-purchase behavior and hence purchase intentions. These include persuasion,
interest, preference, knowledge, awareness, and past purchase experience (Yan et al.,
2021; Tew et al., 2022).

It has been found that there is a direct relationship between brand loyalty and
customers' willingness to purchase and to recommend the product to others. These
studies also investigated the relationship between brand image and purchase inten-
tions, and brand image was founded to be closely related to purchase intention. Brand
awareness is also a significant predictor of purchase intention, and more awareness
to brand is likely to result into higher purchase intentions. Similar to these findings,
Wang et al. (2022) concluded that customers' attitude toward brand has significant
influence on purchase intentions and similar findings were reported in regard to
brand name and purchase intention. Product quality is another key factor to assess
the customers' purchase intentions. Better product quality results cause customers
to incline for more purchases. Accordingly, product quality is closely related to
purchase intentions. These findings were reported by the studies of Ng et al. (2022)
and Wong et al. (2022) that product quality is directly and positively associated with
the purchase intentions. Other studies also reported the same findings (e.g., Yan et al.,
2021).

4 Discussion and Conclusion

Advertisers and consumers are both interested in social commerce, whether they're
shopping online or making money, as this topic has received much attention from
researchers in developed and developing countries alike. As a result, the focus of
this chapter is on the determinants of social commerce (social support theory, social
network theory, elaboration likelihood model, social commerce, innovation barriers,
commitment trust theory, theory of social presence), by addressing relevant studies,
so addressing these determinants will help marketers and companies market their
products and increase the growth of social commerce.

Emotion is associated with behavior and attitudes. Emotional states control
consumers' behavior toward online purchases. In this context, the previous discussion
proved that the factors of content, audience, attitudes, and anchor shape customers'
intentions toward social commerce. Consequently, emotional information influences
customers' judgment toward social commerce platforms. In addition, cognitive abil-
ities also influence customers' feelings of use and trust in social commerce. Because
cognitive abilities affects feelings, memory, and cognition. Customers' decisions and
positive or negative behaviors develop based on feelings. Thus, emotions affect the
expected outcomes for customers. Many social commerce companies struggle to
assess customers' emotional reactions to understand decision-making processes and
to interpret customers' perceptions, beliefs, and intentions toward social commerce
platforms. Previous literature has argued that positive customer intentions are formed
based on emotions. Moreover, positive emotional states have a greater effect on

impulsive buying urges compared to negative emotions. In this context, SEM-ANN analysis literature revealed that emotional states and cognitive processes increase customers' intentions toward social commerce.

References

Aghakhani N, Oh O, Gregg DG, Karimi J (2021) Online review consistency matters: An elaboration likelihood model perspective. Inf Syst Front 23(5):1287–1301

Ahmad Rizal AR, Nordin SM, Ahmad WFW, Ahmad Khiri MJ, Hussin SH (2022) How Does Social Media Influence People to Get Vaccinated? The Elaboration Likelihood Model of a Person's Attitude and Intention to Get COVID-19 Vaccines. Int J Environ Res Public Health 19(4):2378

Algharabat R, Rana NP, Dwivedi YK, Alalwan AA, Qasem Z (2018) The effect of telepresence, social presence and involvement on consumer brand engagement: an empirical study of non-profit organizations. J Retail Consum Serv 40:139–149

Amati V, Lomi A, Mira A (2018) Social network modeling. Annual Review of Statistics and Its Application 5:343–369

Anderson RM, Heesterbeek H, Klinkenberg D, & Hollingsworth TD (2020) How will country-based mitigation measures influence the course of the COVID-19 epidemic?. The Lancet, 395(10228), 931–934. Applications, 535, 122372.

Bai Y, Yao Z, & Dou YF (2015) Effect of social commerce factors on user purchase behavior: An empirical investigation from renren. com. Int J Inf Manag, 35(5), 538–550.

Balto DA (2000) Emerging antitrust issues in electronic commerce. J Public Policy Mark 19(2):277–286

Bazi S, Haddad H, Al-Amad A, Rees D & Hajli N (2022) Investigating the Impact of Situational Influences and Social Support on Social Commerce during the COVID-19 Pandemic. J Theor Appl Electron Commer Res 17(1):104–121

Browning N, Gogo O, & Kimmel M (2018) Comprehending CSR messages: Applying the elaboration likelihood model. Corporate Communications: Int J.

Busalim AH (2016) Understanding social commerce: A systematic literature review and directions for further research. Int J Inf Manage 36(6):1075–1088

Busalim AH, Ghabban F (2021) Customer engagement behaviour on social commerce platforms: An empirical study. Technol Soc 64:101437

Can U, & Alatas B (2019) A new direction in social network analysis: Online social network analysis problems and applications. Physica A: Statistical Mechanics and its and its applications 535:122372

Castro CDABD (2018) The relationship between affect and consumers' resistance to innovation (Doctoral dissertation).

Chen CY, Kearney M, Chang SL (2021) Comparative approaches to mis/disinformation| belief in or identification of false news according to the elaboration likelihood model. Int J Commun 15:23

Chen J, Shen XL (2015) Consumers' decisions in social commerce context: An empirical investigation. Decis Support Syst 79:55–64

Cheng X, Gu Y, Shen J (2019) An integrated view of particularized trust in social commerce: An empirical investigation. Int J Inf Manage 45:1–12

Chung KC, Liang SWJ (2020) Understanding factors affecting innovation resistance of mobile payments in Taiwan: An integrative perspective. Mathematics 8(10):1841

Dinesh S, MuniRaju Y (2021) Scalability of e-commerce in the COVID-19 era. International Journal of Research-GRANTHAALAYAH 9(1):123–128

Fock ST, Koh HC (2006) Conceptualization of Trust and Commitment: Understanding the Relationships between Trust and Commitment and the Willingness to Try Internet Banking Services. International Journal of Business and Information 1(2):194–208

Fong LHN, Chui PMW, Cheong ISC, Fong DKC (2018) Moderating effects of social support on job stress and turnover intentions. J Hosp Market Manag 27(7):795–810

Friman M, Gärling T, Millett B, Mattsson J, Johnston R (2002) An analysis of international business-to-business relationships based on the Commitment-Trust theory. Ind Mark Manage 31(5):403–409

Gefen D, Straub DW (2004) Consumer trust in B2C e-commerce and the importance of social presence: experiments in e-products and e-services. Omega 32(6):407–424

Gibreel O, AlOtaibi DA, Altmann J (2018) Social commerce development in emerging markets. Electron Commer Res Appl 27:152–162

Griffith EE, Nolder CJ, & Petty RE (2018) The elaboration likelihood model: A meta-theory for synthesizing auditor judgment and decision-making research. Auditing: J Pract Theory, 37(4), 169–186.

Gurrieri L, & Drenten J (2019) Visual storytelling and vulnerable health care consumers: normalising practices and social support through Instagram. J Serv Mark.

Hajli MN (2014) The role of social support on relationship quality and social commerce. Technol Forecast Soc Chang 87:17–27

Hajli N, Sims J, Zadeh AH, Richard MO (2017) A social commerce investigation of the role of trust in a social networking site on purchase intentions. J Bus Res 71:133–141

Hamari J, Koivisto J (2015) "Working out for likes": An empirical study on social influence in exercise gamification. Comput Hum Behav 50:333–347

Han H, Xu H, Chen H (2018a) Social commerce: A systematic review and data synthesis. Electron Commer Res Appl 30:38–50

Han JT, Chen Q, Liu JG, Luo XL, Fan W (2018b) The persuasion of borrowers' voluntary information in peer to peer lending: An empirical study based on elaboration likelihood model. Comput Hum Behav 78:200–214

Hennig-Thurau T (2000) Relationship quality and customer retention through strategic communication of customer skills. J Mark Manag 16(1–3):55–79

Ho RC, Cheng R (2020) The impact of relationship quality and social support on social media users' selling intention. International Journal of Internet Marketing and Advertising 14(4):433–453

Husnain M, Toor A (2017) The impact of social network marketing on consumer purchase intention in Pakistan: Consumer engagement as a mediator. Asian J Bus Account 10(1):167–199

Hu X, Chen X, Davison RM (2019) Social support, source credibility, social influence, and impulsive purchase behavior in social commerce. Int J Electron Commer 23(3):297–327

Ismagilova E, Dwivedi YK, & Rana N (2021, September) The use of elaboration likelihood model in eWOM research: Literature review and weight-analysis. In Conference on e-Business, e-Services and e-Society (pp. 495–505). Springer, Cham.

Itliong J (2020) Online strategies for small businesses affected by Covid-19: a social media and social commerce approach.

Jiang C, Rashid RM, Wang J (2019) Investigating the role of social presence dimensions and information support on consumers' trust and shopping intentions. J Retail Consum Serv 51:263–270

Joachim V, Spieth P, Heidenreich S (2018) Active innovation resistance: An empirical study on functional and psychological barriers to innovation adoption in different contexts. Ind Mark Manage 71:95–107

Kautish P, Walia S, Kour P (2021) The moderating influence of social support on career anxiety and career commitment: an empirical investigation from India. J Travel Tour Mark 38(8):782–801

Kim DH, Lee YJ (2020) The Effect of Innovation Resistance of Users on Intention to Use Mobile Health Applications. Journal of the Korean BIBLIA Society for Library and Information Science 31(1):5–20

Koch J, Kraemer T, Heidenreich S (2021) Exploring passive innovation resistance—An empirical examination of predictors and consequences at the cognitive and situational level. Int J Innov Manag 25(01):2150012

Komiak SX, Benbasat I (2004) Understanding customer trust in agent-mediated electronic commerce, web-mediated electronic commerce, and traditional commerce. Inf Technol Manage 5(1/2):181–207

Kozinets RV, De Valck K, Wojnicki AC, & Wilner SJ (2010) Networked narratives: Understanding word-of-mouth marketing in online communities. Journal of marketing, 74(2), 71–89. Delu, W. (2019). Enterprise network marketing strategy based on SNS social network. In 2019 12th International Conference on Intelligent Computation Technology and Automation (ICICTA) (pp. 295–299). IEEE.

Lee SA (2018) Investigating antecedents and outcome of telepresence on a hotel's website, Int J Contemp Hosp Manag, 30(2) https://doi.org/10.1108/ijchm-12-2015-0722.

Leong LY, Hew TS, Ooi KB, Lin B (2019) Do electronic word-of-mouth and elaboration likelihood model influence hotel booking? Journal of Computer Information Systems 59(2):146–160

Leong LY, Hew TS, Ooi KB, & Lin B (2021) A Meta-Analysis of consumer innovation resistance: Is there a cultural invariance? Ind Manag Data Syst ahead-of-p(ahead-of-print). doi: https://doi.org/10.1108/IMDS-12-2020-0741.

Li CY, Ku YC (2018) The power of a thumbs-up: Will e-commerce switch to social commerce? Information & Management 55(3):340–357

Li F, Larimo J, Leonidou LC (2021) Social media marketing strategy: definition, conceptualization, taxonomy, validation, and future agenda. J Acad Mark Sci 49(1):51–70

Liang TP, Ho YT, Li YW, Turban E (2011) What drives social commerce: The role of social support and relationship quality? Int J Electron Commer 16(2):69–90

Linda SLAI (2010) Social commerce–e-commerce in social media context. World Academy of Science Engineering and Technology 72:39–44

Loh XK, Lee VH, Loh XM, Tan GWH, Ooi KB, & Dwivedi YK (2021) The dark side of mobile learning via social media: how bad can it get? Inf Syst Front 1–18.

Loh XM, Lee VH, Tan GWH, Hew JJ, Ooi KB (2022) Towards a cashless society: the imminent role of wearable technology. J Comput Inf Syst 62(1):39–49

Lu B, Fan W, Zhou M (2016) Social presence, trust, and social commerce purchase intention: An empirical research. Comput Hum Behav 56:225–237

Luo X (2001) Web users' privacy concerns, trust, and online behavior: An empirical investigation, working paper, Department of Business Administration, State University of New York, Albany, NY

Malaga RA (2001) Web-based reputation management systems: problems and suggested solutions. Electron Commer Res 1:403–417

Manca S, Altoè G, Schultz PW, Fornara F (2020) The persuasive route to sustainable mobility: elaboration likelihood model and emotions predict implicit attitudes. Environ Behav 52(8):830–860

Mani Z, Chouk I (2018) Consumer resistance to innovation in services: challenges and barriers in the internet of things era. J Prod Innov Manag 35(5):780–807

Matsuo M, Minami C, Matsuyama T (2018) Social influence on innovation resistance in internet banking services. J Retail Consum Serv 45:42–51

Meng B, & Choi K (2019) Tourists' intention to use location-based services (LBS): Converging the theory of planned behavior (TPB) and the elaboration likelihood model (ELM). Int J Contemp Hosp Manag.

Mirabi V, Akbariyeh H, & Tahmasebifard H (2015) A study of factors affecting on customers purchases intention. J Multidiscip Eng Sci Technol (JMEST) 2(1).

Morgan RM, Hunt SD (1994). The commitment-trust theory of relationship marketing. J mark 58(3):20–38

Mukherjee A, & Nath P (2007) Role of electronic trust in online retailing: A re-examination of the commitment-trust theory. Eur J Mark.

Muller E, Peres R (2019) The effect of social networks structure on innovation performance: A review and directions for research. Int J Res Mark 36(1):3–19

Ng FZX, Yap HY, Tan GWH, Lo PS, Ooi KB (2022) Fashion shopping on the go: A Dual-stage predictive-analytics SEM-ANN analysis on usage behaviour, experience response and cross-category usage. J Retail Consum Serv 65:102851

Osatuyi B, & Hughes J (2018, January) A tale of two internet news platforms-real vs. fake: An elaboration likelihood model perspective. In Proceedings of the 51st Hawaii International Conference on System Sciences.

Osei-Frimpong K, McLean G (2018) Examining online social brand engagement: a social presence theory perspective. Technol Forecast Soc Chang 128:10–21

Oztok M, & Brett C (2011) Social presence and online learning: A review of the research.

Palmer C, Fasbender U, Kraus S, Birkner S, Kailer N (2021) A chip off the old block? The role of dominance and parental entrepreneurship for entrepreneurial intention. RMS 15(2):287–307

Rexhepi G, Berisha B (2017) The effects of emotional intelligence in managing changes: An entrepreneurial perspective. World Review of Entrepreneurship, Management and Sustainable Development 13(2–3):237–251

Rexhepi G, Abazi H, Rahdari A, & Angelova B (2019) Open Innovation Models for Increased Innovation Activities and Enterprise Growth. In Open Innovation and Entrepreneurship (pp. 37–49). Springer, Cham.

Richter A, Koch M, & Krisch J (2007) Social commerce: Eine Analyse des Wandels im E-commerce. Fak. für Informatik, Univ. der Bundeswehr München.

Ridings CM, & Gefen D (2004) Virtual community attraction: Why people hang out online. J Comput-Mediat Comm, 10(1), JCMC10110.

Schieb C, Preuss M (2018) Considering the Elaboration Likelihood Model for simulating hate and counter speech on Facebook. SCM Studies in Communication and Media 7(4):580–606

Sepasi S, Rexhepi G, Rahdari A (2021) The changing prospects of corporate social responsibility in the decade of action: Do personal values matter? Corp Soc Responsib Environ Manag 28(1):138–152

Sharma S, Menard P, Mutchler LA (2019) Who to trust? Applying trust to social commerce. J Comput Inf Syst, 59(1):32–42

Sheikh Z, Yezheng L, Islam T, Hameed Z, & Khan IU (2019) Impact of social commerce constructs and social support on social commerce intentions. Inf Technol People.

Shi J, Hu P, Lai KK, & Chen G (2018) Determinants of users' information dissemination behavior on social networking sites: An elaboration likelihood model perspective. Internet Res.

Song C, Brown HT, & Tameez RR (2020) The effectiveness of perceived social support in discount stores in Korea. Asia Pacific J Mark Logist.

Tabassum S, Pereira FS, Fernandes S, Gama J (2018) Social network analysis: An overview. Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery 8(5):e1256

Tajvidi M, Wang Y, Hajli N, Love PE (2021) Brand value Co-creation in social commerce: The role of interactivity, social support, and relationship quality. Comput Hum Behav 115:105238

Tew HT, Tan GWH, Loh XM, Lee VH, Lim WL, Ooi KB (2022) Tapping the next purchase: embracing the wave of mobile payment. J Comput Inf Syst, 62(3):527–535

Thatcher JB, George JF (2004) Commitment, trust, and social involvement: An exploratory study of antecedents to web shopper loyalty. J Organ Comput Electron Commer 14(4):243–268

Tseng HT (2022) Shaping path of trust: The role of information credibility, social support, information sharing and perceived privacy risk in social commerce. Inf Technol People.

Wan SM, Cham LN, Tan GWH, Lo PS, Ooi KB, & Chatterjee RS (2021) What's Stopping You from Migrating to Mobile Tourism Shopping?. J Comput Inf Syst, 1–16.

Wang G, Tan GWH, Yuan Y, Ooi KB, Dwivedi YK (2022) Revisiting TAM2 in behavioral targeting advertising: A deep learning-based dual-stage SEM-ANN analysis. Technol Forecast Soc Chang 175:121345

Wang X, Tajvidi M, Lin X, Hajli N (2020) Towards an ethical and trustworthy social commerce community for brand value co-creation: A trust-commitment perspective. J Bus Ethics 167(1):137–152

Wang Y, Yu C (2017) Social interaction-based consumer decision-making model in social commerce: The role of word of mouth and observational learning. Int J Inf Manage 37(3):179–189

Wong LW, Tan GWH, Hew JJ, Ooi KB, Leong LY (2022) Mobile social media marketing: a new marketing channel among digital natives in higher education? J Mark High Educ 32(1):113–137

Wongkitrungrueng A, Assarut N (2018) The role of live streaming in building consumer trust and engagement with social commerce sellers. J Bus Res 117:543–556. https://doi.org/10.1016/j.jbusres.2018.08.032

Xu F, Warkentin M (2020) Integrating elaboration likelihood model and herd theory in information security message persuasiveness. Comput Secur 98:102009

Yahia IB, Al-Neama N, Kerbache L (2018) Investigating the drivers for social commerce in social media platforms: Importance of trust, social support and the platform perceived usage. J Retail Consum Serv 41:11–19

Yamin M, & Kurt Y (2018) Revisiting the Uppsala internationalization model: Social network theory and overcoming the liability of outsidership. Int Mark Rev.

Yan LY, Tan GWH, Loh XM, Hew JJ, Ooi KB (2021) QR code and mobile payment: The disruptive forces in retail. J Retail Consum Serv 58:102300

Yuan YP, Tan GWH, Ooi KB, Lim WL (2021) Can COVID-19 pandemic influence experience response in mobile learning? Telematics Inform 64:101676

Zhou L, Zhang P, Zimmermann HD (2013) Social commerce research: An integrated view. Electron Commer Res Appl 12(2):61–68

Nadia A. Atshan is a lecturer at the Southern Technical University, Management Technical College. She received her MBA from the University of Basrah. Her research interests lie in organizational studies.

Gadaf Rexhepi is Associate Professor at Business and Economics, Southeast European University, Tetovo, the Republic of Macedonia. He received a master's degree in total quality management from Economic Faculty, Ss. Cyril and Methodius, Skopje, Macedonia, Skopje, and Macedonia. His doctorate from Economic Faculty, Wolverhampton University, Cyril and Methodius, United Kingdom, and Macedonia. He published many papers at prestige and high impact journals.

Technology Acceptance Model in Social Commerce

Fawaz Jumaah, Sani Salisu, and Shahad Alfahad

1 Introduction

There has been a great development in technology over the recent past, which has led to a fundamental change in the daily lifestyle. In addition, technological innovations are in full swing in enhancing multiple features which have forced companies to change their strategies in line with the needs of consumers (Li et al. 2022; Lo et al. 2022). Many sectors have invested in this development and obtained the maximum benefit by using these updated technologies to develop their products and services at a faster rate (Sharma et al. 2018; Zhong et al. 2021). There are many theories used to explore the possibility of adopting specific techniques in different circumstances. Notable theories to investigate the adoption of people-oriented technology include rational action theory, diffusion of innovation theory, planned behavior theory, TAM, UTAUT, and UTAUT2. Using these theories to investigate technology adoption assumes that adoption of a particular technology is due to what individuals believe about the technology and their responses to intent to adopt (Duan and Deng 2021). TAM is the dominant model in the research landscape today. TAM is a measure that tests people's tendency to adopt a particular technology designed to perform a specific job. It tests this behavior by explaining the intentions that lead to the adoption of the new technology. There are external changes that control these variables such as self-efficacy, subjective standards, and conditions of use in technology facilities. TAM has gained importance, particularly because of its portability to different

F. Jumaah (✉)
School of Computer Science, University De Montreal, De Montreal, Canada
e-mail: fawaz.jumaah@polymtl.ca

S. Salisu
Department of Information Technology, Federal University Dutse, Dutse, Jigawa State, Nigeria
e-mail: sani.salisu@fud.edu.ng

S. Alfahad
Management Technical College, Southern Technical University, Basrah, Iraq

contexts and samples, the ability to account for differences in intent to use or use technology, and its simplicity in specifications within structural equation modeling frameworks (Scherer et al. 2018; Naqvi et al. 2019).

The technology acceptance model has been used as the most important scientific method for understanding technology integration. TAM is the most common form in the context of the social sciences. TAM defines that people's attitude and feeling, positively or negatively, regarding the performance of the behavioral intention toward adopting a system can be predicted by their perceived usefulness and usability (Davis 1985, 1989; Huang et al. 2019). TAM demonstrated the predictability of perceived benefit by highlighting ease of use. In other words, the perceived benefit is the level that determines the intent to adopt a particular behavior (Sukendro et al. 2020). The technology acceptance model first proposed by Davis (1989) includes basic user motivational variables (i.e., perceived usefulness, perceived ease of use, and attitudes toward technology) and outcome variables (i.e., behavior, usage intentions, perceived utility, and perceived ease of use) the main variables that directly or indirectly explain the results. Among others, the subjective criterion, the subjective effectiveness, and the moderation conditions were significant. These external variables represent personal abilities along with contextual factors (Scherer et al. 2018; Singh and Srivastava 2019).

TAM is derived from logical action theory, a behavioral theory, and a theory of planned behavior. TAM consists of two basic architectures: perceived utility, and performance. Literature established that both structures are effective in influencing users' attitudes toward technology adoption (Guoqiang et al. 2022). To define TAM, it is a model originally developed to study employee use of technology in the work environment that may not adequately reflect user decision-making in consumption scenarios (Guoqiang et al. 2022). Thus, TAM has proven to be accurate and effective within forecasting, explaining news generation, news generation systems, seriously net-based, B2C electronic services, and shopping discovery. TAM refers to intent to use a particular technology or system considering the perceived benefit and resistance to use and adoption (Ramírez-Correa et al. 2019; Singh et al. 2020).

2 Discussion

The rapid advancement of contemporary technology has considerably improved life's amenities, but it has also raised some significant problems with the acceptance of new technology. As customers are the focus of institutions, adoption of technology has been emphasized as a critical challenge facing many of them. The UTAUT, UTAUT2, and TAM2 models are widely used in the literature (Alkawsi et al. 2020). The characteristics of the technology acceptance model can be used to identify the most significant barriers to customer adoption of new electronic channels or payment methods (Alkawsi et al. 2020(.

TAM is introduced by Fred Davis in 1989 to understand the mechanisms of user acceptance of information systems technology and improve these processes further

and to help evaluate new systems in a user-appropriate state before implementing them (Davis 1989; Huang et al. 2019). TAM was created using the stimulus object response model conceptual framework. Its function refers to a psychological philosophy that considers mental life, behavior, and the extent of active adaptation to one's environment. TAM is adapted from the planned behavior theory and behavioral rationale theory. TAM consists of two basic structures that have been shown to influence behavioral intent perceived usefulness and perceived ease of use. Much of the literature has emphasized that both structures effectively influence when introducing any new technology on users' attitudes toward technology adoption (Guoqiang et al. 2022; Ramírez-Correa et al. 2019; Singh and Srivastava 2019).

Scherer et al. (2018) and Pipitwanichakarn and Wongtada (2019) show the TAM2 model represents the core of TAM and focuses on behavioral intentions as an outcome. The UTAUT model extends the original model using technology. UTAUT was once created to inspect an individual's acceptance and use of rising facts structures in organization s. UTAUT was once unable to evaluate the direct outcomes of accepting the clever meter and to make clear the new relationships. Notably, one problem with this strategy used to be the excessive coefficient of dedication of the UTAUT cost (Alkawsi et al. 2020). UTAUT is a complete principle that explores technological adoption intentions with four constructs, inclusive of overall performance expectation, effort expectancy, social impact, and facilitation status. It has been extensively used to investigate the adoption of several applied sciences such as cellular banking, social media, biometrics, wearable applied sciences, and cellular fee (Duan and Deng 2021).

It is considered the basis of many studies that have been concerned with understanding user behavior regarding the adoption and acceptance of new technology because of its ability to provide an effective (Eneizan et al 2019). UTAUT emerged from the empirical comparison of seven models specifically technology acceptance model, logical action theory, motivational model, planned behavior theory, personal computer uses model, innovation diffusion theory, and social cognitive theory (Ramírez-Correa et al. 2019). UTAUT popularity stems from its superior ability to explain 77% of behavioral intent variances and 52% of technology usage variances—technology acceptance and user behavior, particularly in relation to privacy when disclosing information (Sharma et al. 2018; Alkawsi et al. 2020). This is because people are concerned about possible misuse of their collected personal information. Technology acceptance models have been widely adopted to explain people's intent to disclose information when using certain technologies (Duan and Deng 2021; Alkawsi et al. 2020). When the perceived benefits outweigh the perceived risks, people are more likely to disclose their personal information. Perceived trust is embedded in the technology adoption framework to understand technology adoption from an information disclosure perspective (Hamid et al. 2021; Albahri et al. 2021). The elevated degree of interest considering another innovation prompts a high likelihood of reception of the innovation (Guoqiang et al. 2022). Additionally, this concentrate likewise planned a lengthy TAM with other exogenous factors (e.g., help of conditions, individual development, saw delight, and coupon accessibility) included to foresee customer acknowledgment of innovation and gain a superior

comprehension of innovation acknowledgment in various circumstances precisely (Ramírez-Correa et al. 2019).

It is viewed as one of the basic factors that can emphatically influence both helpfulness and ease of use as private development additionally influences customers' impression of the handiness and convenience of innovation. Individual development can assume a significant part in the beginning phases of taking on another innovation (Alkawsi et al. 2020). An intensive comprehension of purchasers' perspectives toward the utilization of innovation, drivers, for example, helpfulness and convenience of innovation, ought not be considered as the main game changers since certain customers may simply need to set aside cash or appreciate utilizing this innovation.

Customers will generally have an inspirational perspective toward its utilization. Seen delight was found to emphatically affect clients' view of convenience and conduct expectation. Moreover, orientation could be one more component that assumes a fundamental part in the innovation acknowledgment model. Attention to distinctions in sexual orientation is basic to forming business systems to further develop customer experience (Zhong et al. 2021). Alkawsi et al. (2020) state that the model is misrepresented and considered inadequate to make sense of buyer conduct as it connects with genuine practices and needs exogenous factors. The hidden designs of the TAM can be additionally impacted by numerous outside factors. Moreover, the first TAM was at first intended to explore representatives' utilization of innovation in the working environment climate, which may not enough mirror the dynamic course of buyers in customer situations (Alsalem et al. 2022; Al-Abrrow et al. 2021; Hadi et al. 2018).

3   Dimensions

The literature has indicated that performance expectancy, trust, effort expectancy, price value, social influence, facilitating conditions, hedonic motivation, habit, risk, information quality, privacy, lifestyle, and self-efficacy are important elements for improving the predictive validity of TAM. It is important to consider the dimensions that have been shown to have a significant impact on the adoption of technology acceptance and access to a multidimensional view (Eneizan et al. 2019; Pipitwanichakarn and Wongtada 2019). In this regard, performance expectancy can be defined as the extent to which a person realizes the gains and advantages that will achieve in the job performance of individuals because of the application of modern technology (Sharma et al. 2018; Alkawsi et al. 2020; Alam et al. 2020). Performance expectancy is the extent to which the user is aware of the functionality that can be obtained because of using information systems. In general, the benefit of this technology in daily life is the factor that makes customers more motivated to adopt this technology (Alam et al. 2020). Performance expectancy is positively correlated with individuals' intention to adopt the technology acceptance model. It has been found that the expected performance has a positive effect on the intention to use customized

services (Fadhil et al. 2021; Abbas et al. 2021; Albahri et al. 2022; Al-Abrrow et al. 2021). When adopting certain services or products, individuals who have positive expectations about performance are likely to have more serious intentions (Duan and Deng et al. 2021). Moreover, performance expectancy is far visible because of the maximum critical indicator of behavioral motive to simply accept new technologies (Alkawsi et al. 2020). Several studies have adopted the UTAUT model and found that expectation of performance is an important predictor of behavioral intentions to embrace new technologies. Expectation of performance influences users' behavioral intent and their decision to adopt the technology (Sharma et al. 2018). It is important to realize that the expectation of performance has a crucial impact on consumer attitudes (Alam et al. 2020; Eneizan et al. 2019).

Trust indicates an individual's willingness to rely on a trusted partner with whom to exchange and share personal information (Alam et al. 2020). Several studies of technology acceptance have shown that people may resist or be reluctant to use technology based on perceived trust. Trust can significantly influence a population's behavioral intention to use new technologies in terms of individual attitudes (Sharma et al. 2018). Consumer confidence can be measured in different ways. Information documented in the relevant literature indicates that trust can be evaluated by examining consumers' perceptions of admiration, importance, value, usefulness, ideas about the use of innovation, and sense of satisfaction in using a particular innovation (Eneizan et al. 2019). Trust has been an important factor influencing the acceptability of information systems in several research studies. Lack of transparency and reliability in the procedures for requesting service or information can lead to mistrust and resistance to technology adoption (Sharma et al. 2018). Therefore, trust in terms of data analysis and tracking strongly influences adoption behavior (Alam et al. 2020).

The expected effort is the degree of simplicity required to use the technologies associated with an information system (Alam et al. 2020; Duan and Deng 2021). In other words, it is an estimate of the level at which an individual who interacts with a particular system or technology requires less mental and physical effort (Sharma et al. 2018). Many users tend to evaluate the necessary effort before using the information system. In previous studies, effort expectancy was recognized as an important factor for acceptance of innovative technologies, where the level of usability associated with information system significantly and positively affected behavioral intent toward various new age technologies (Alam et al. 2020). People prefer technology that is easy to use and provides maximum efficiency. User-friendly technologies have a positive effect on people's willingness to accept them. People's perception of being able to use cloud computing without putting in much effort strongly influences intent to adopt it. The expected efforts will have a positive impact on the utilization of online banking services. The less effort people put into using such an app, the more likely they are to rely on it (Al-Abrrow et al. 2019; Alnoor et al. 2020; Abdullah et al. 2021). The expectation of effort positively affects the intent to introduce contact tracing apps. Expected effort and expected income are theoretically derived from perceived ease of use and perceived benefit (Duan and Deng 2021). Expected effort also plays an important role in the behavioral intent of individuals toward new technology (Sharma et al. 2018). The higher the energy efficiency and quality, the faster the rate of adoption

of products or innovations offered by technology. Thus, the idea of energy efficiency has a positive impact on the use of business intelligence and the adoption of new technologies (Eneizan et al. 2019).

Price value is an important factor in consumer attitudes toward adopting diversified technologies. The consumer's purchasing decision depends on the level of the price, since buyers are interested in reasonable costs in commercial exchanges (Alam et al. 2020). The cost paid must be firmly anchored in the performance or benefits buyers expect from the item. Previous research has shown that price metrics strongly influence the mindset of buyers (Eneizan et al. 2019). On the other hand, social influence is described as the stage at which the person feels that his or her selections to undertake or reject new applied sciences are influenced through the opinions of the events that rely to them. Previous studies confirmed that social influence would positively impact a user's behavior (Alkawsi et al. 2020). Social influence is related to the diploma to which folks pick out that others who are vital to them consider it is essential for them to use technology (Duan and Deng 2021). Social influence is particularly correlated with the diploma to which the consequences of the use of new merchandise or improvements are apparent and advisable to pals and family. When customers be aware that others are keen to use new merchandise or innovations, these merchandises are extra possibly to be disbursed to their environment greater quickly (Eneizan et al. 2019). Social influence is a vital indicator of intent to use and be given technology. Social influence is the practice of peers and opinion makers who are influencing the behaviors and attitudes of potential and current customers during purchasing (such as family, friends, co-workers, and so on) (Sharma et al. 2018). The extent to which a character is conscious of the beliefs of substantial others is what will advise to him or her that he or she must use the new statistics system. As a result, the individual's behavioral intention to take delivery of the science is radically influenced with the aid of the surrounding surroundings to which it belongs (Alam et al. 2020).

The degree to which the person senses there is an organizational and technological infrastructure to enable the usage of the system is characterized as facilitating conditions. When adopting new technology, people frequently want assistance in comprehending features. Furthermore, when enabling conditions are poor, people resist employing new technology. Several information systems researchers concluded that enabling factors were recognized as a primary driver of behavioral intention (Sharma et al. 2018). It encompasses both internal and external factors that have an impact on the decision to adopt someone. Internal elements emphasize people's capability for adoption (Duan and Deng 2021). The behavioral effort to accept information systems will be influenced by the technological support levels that are significant. Recent empirical studies revealed that favorable circumstances have a direct impact on behavioral attempts to accept new technologies (Alkawsi et al. 2020). The significance of facilitating prerequisites in science adoption has been identified in the modern research as there are many facilitating stipulations such as availability of statistics and assistance, provision of education, and technical support, as abilities and information of people facilitating adoption selections (Duan and Deng 2021).

Finally, the context in which the person is aware of the availability of organizational and technological infrastructure capabilities that support the use of the new information system is referred to as facilitating conditions (Alam et al. 2020).

Hedonic motivation is described as the ability to escape reality to satisfy consumer needs for entertainment or emotional engagement (Eneizan et al. 2019). Hedonic motivation has been defined as the degree of pleasure derived because of the use of innovation in technology, and its vital role in determining the acceptance and use of technology has been noted (Alam et al. 2020). It has been found that the more clearly the entertainment component is, the more important is the potential for buyers to portray an agreed-upon view of the use and acceptance of technologies (Eneizan et al. 2019). Individuals can additionally use cell functions to function duties and private enjoyment in the context of e-health consumers. When customers are recognizing the entertainment, joy, happiness, comfort, pleasure, and delight of using new technology, they are greater probably to accept and adopt new technology (Alam et al. 2020).

Habit is a conduct that human beings intend to function robotically and again and again due to the fact of studying or experience. It is additionally a reflection of previous experiences and a perceptual variable (Alam et al. 2020; Alkawsi et al. 2020). Habits help reduce consumer dissatisfaction with a product by internalizing emotional attachment to the product through absolute purchases. This structure is closely related to behavioral control through the concept of internal and external influences (Eneizan et al. 2019). In the field of technology system, habit can be described as the frequent use of applications of smart technologies. Previous studies indicated that the smart meter system, which would affect the behavioral attempt to use the smart meter, has changed the practice of implementing the behavior from general to more accurate (Alkawsi et al. 2020). In addition, if consumers engage in a technology behavior, their initial use intentions will be reactivated, which will positively lead to frequent use (Alam et al. 2020).

The risk related to sure commercials can be traced lower back to shoppers who are anxious or skeptical about the products or offerings offered. The assessment of risk certainly starts in the early ranges of growing the relationship between the corporation and its attainable customers. Risk has a substantial effect on patron behavior (Eneizan et al. 2019). According to Alam et al. (2020), privacy issue is defined as the right of an individual to have direct and exclusive control over what a third party can hold. A privacy account model has been adopted. This demonstrates that consumers analyze the risks and benefits when sharing information with vendors (Eneizan et al. 2019). Lifestyle is defined as an individual's distinctive way of life or way of life, such as an individual's activities, opinions, and interests. On the other hand, lifestyles are a direct or indirect introduction to the behavioral intent of users who build high-tech services (Alnoor 2020; Khaw et al. 2022a). Highly compatible with lifestyle has become the first approved technology in the history of human behavior (Alam et al. 2020). Self-efficacy refers to the technical skills or knowledge of an individual to perform tasks appropriate to the use of technology sources such as smartphones and wireless technologies. This will allow people to continue using them. Recent research shows an effective role for self-efficacy in influencing the intention to adopt modern

technologies and electronic services, with a direct or indirect positive correlation between self-efficacy and technology acceptance (Alam et al. 2020).

4 Results

The tremendous development in technology and modern knowledges have greatly facilitated life with all its facilities. As a result, important issues have emerged in the adoption of this technology. The acceptance of technology has been highlighted as a vital issue facing many consumers as they are the most important goal of institutions. Literature has adopted the UTAUT, UTAUT2, TAM, and TAM2 model. Scientists have expanded such models extensively. The factors that describe the technology acceptance model help reveal the most important factors in customer resistance to adopting new payment methods or adopting new electronic channels (Alnoor et al. 2021; Atshan et al. 2022; Alhamdi et al. 2019; Jabbar et al. 2020). There are many theories to consider when adopting a particular technology under different circumstances. In response to technology and intentions to employ, the most popular and widely used impact model in research is the TAM model. TAM is a model designed by Davis in 1989 to explain the behavioral initiatives of consumers and their tendency to adopt the use of technology through a set of variables, the most important of which are ease of use and perceived usefulness.

TAM could navigate between different contexts and changing samples, which has allowed it to stand out, the possibility to account for variance in use or intent to use the technique, and its generally accepted simplicity within the framework of structural equation modeling. In addition, TAM is a description of teacher adoption of technology along with other paradigms. The high benefit obtained from a new technology leads to a high chance of acceptance of the technology. However, several studies have attempted to demonstrate that TAM is more suitable for different contexts by introducing new exogenous variables. Likewise, scientists can exploit this idea to develop more efficient technology adoption strategies by looking closely at external factors related to use and benefits. Therefore, this chapter discussed TAM model with different exogenous variables (e.g., circumstance facilitation, non-public innovation, perceived joy, and coupon availability) to predict technological adoption and obtain a higher perception of technological adoption in different situations. Facilitation phrases of the UTAUT are one of the quintessential elements that can positively influence each utility and usability. Personal innovation additionally influences consumer perceptions of the usefulness and ease of use of technology. Personal innovation can play a vital position in the early ranges of adopting new technologies (Alnoor et al. 2022; Khaw et al. 2022b; Alharbi and Alnoor 2022). More importantly, for a full appreciation of patron attitudes toward technological use, elements such as the usefulness and ease of use of the new technological must be disregarded. When customers revel in the use of a unique technology, they tend to be tremendous about its use. Perceived happiness was determined to have an advantageous impact on customers' appreciation of usability and behavioral intent. For customers who

fee deals, the availability of coupons can be every other key element that can influence their perceived usefulness, attitude, and intention to use the new technology. Customers who qualify for positive coupons may also be notably inspired with the aid of monetary incentives to use a precise technology. Additionally, gender may want to be some other element that performs a necessary position in the sample of science adoption. Awareness of gender variations is essential to formulating enterprise techniques to enhance consumer experience. Males can range from females in terms of IT issues. Males tend to be greater indispensable and skeptical. However, females depend extra on interplay and verbal exchange when dealing with new concepts (Wah et al. 2022).

TAM is the most broadly adopted model for predicting person's intentions and utilization conduct in acceptance technology research. TAM consists of two fundamental constructions, perceived usefulness and perceived ease of use. Previous research has determined that each construction successfully influences users' attitudes toward science adoption. However, the authentic TAM model is now not accepting its flaws. Literature regarded the model to be too simplistic and inadequate to explain patron conduct associated with proper practice and emphasized that the unique TAM did no longer incorporate exogenous variables. The TAM primary shape can be similarly influenced via many exterior variables. The technology of acceptance model aims to understand the behaviors and intent to use new technology. The thinking of the model is designed to enhance a complete lookup model to receive new technologies. In addition, some research declares that it can be regarded a wonderful model used to recognize the acceptance and fine use of country law in creating countries. Fred Davis delivered the TAM in 1987 with the aim of higher perception the procedure of person acceptance of data systems and permitting it to be evaluated earlier than enforcing a new system. TAM is used to create the usage of the stimulus object response model conceptual framework. TAM has been a key model for appreciation the acceptance system of customers of records structures in a range of conditions for decades.

Specifically, UTAUT was once born from an empirical contrast of seven models, technological acceptance model, logical conduct theory, motivational model, deliberate conduct theory, non-public laptop uses model, innovation diffusion theory, and social cognitive theory. The experimental outcomes confirmed that UTAUT can explain about 70% of the variance of the mean conduct of the usage of the new system. The UTAUT model advances the cumulative principle while preserving a sparse shape by combining the exploratory powers of character models with primary mitigation effects. Behavioral use described as frequency of IT use is advocated to be together defined via behavioral intent. The country of facilitation is described as an individual's appreciation of the sources and help accessible to function an action. Habit is described as the diploma to which humans tend to robotically function getting to know actions. Personal innovation influences customers' perceptions of technology usefulness and usability. Personal innovation can play an essential function in the early tiers of adopting new technologies. More importantly, customers pointed out that drivers such as usefulness and ease of use of new applied sciences ought to no longer be regarded as the solely determinants for a complete grasp of

consumers' attitudes toward science use. In this context, facilitating conditions are described as a person's perceptions of the assets and aid accessible to elevate the behavior. Also, habit is described as the extent to which humans tend to function the conduct routinely as a result of learning. In order to adapt UTAUT to its purchaser context, a phase of it was once developed to get entry to UTAUT2. UTAUT2 tries to provide an explanation for why human beings use the statistics and technology accessible to them overall. UTAUT2 proposes that behavioral use is described as the frequency of IT use and decided by way of behavioral intent. Moreover, behavioral intent is described as the extent to which a character has formulated aware plans to operate some or non-specific future conduct.

Customers within high experience of using a specific technology tend to be fantastic about it. Hence, feeling pleasure had a high-quality impact on customers' grasp of ease of use and behavioral intent. Also, the availability of coupons can be any other essential element that can affect the understanding of interest, attitudes, and intent to use new technologies. Customers who revel in sure coupons can be incentivized to use sure applied sciences via monetary incentives. In addition, gender may also be some other issue that performs an essential position in the science acceptance model. Recognizing gender variations is necessary for creating enterprise techniques to enhance consumer experience. The males and females have different feelings toward technology acceptance. Furthermore, such an issue can supply an extra complete clarification of the adoption of facial focus repayments by means of investigating gender variations in the usage of the proposed model. Finally, each perceived usefulness and perceived ease of use is decided via exogenous variables. TAM has been the dominant paradigm for perception consumer acceptance tactics for record structures in many exceptional environments over the previous decades.

References

Abbas S, Al-Abrrow H, Abdullah HO, Alnoor A, Khattak ZZ, Khaw KW (2021) Encountering Covid-19 and perceived stress and the role of a health climate among medical workers. Curr Psychol, pp 1–14

Abdullah H, Ismail I, Alnoor A, Yaqoub E (2021) Effect of perceived support on employee's voice behaviour through the work engagement: a moderator role of locus of control. Int J Process Manag Benchmarking 11(1):60–79

Al-Abrrow H, Alnoor A, Abbas S (2019) The effect of organizational resilience and CEO's narcissism on project success: organizational risk as mediating variable. Organ Manag J 16(1):1–13

Al-Abrrow H, Fayez AS, Abdullah H, Khaw KW, Alnoor A, Rexhepi G (2021) Effect of open-mindedness and humble behavior on innovation: mediator role of learning. Int J Emerg Mark, Vol. ahead-of-print No. ahead-of-print

Alam MZ, Hu W, Kaium A, Hoque R, Didarul Alam MM (2020) Understanding the determinants of mHealth apps adoption in Bangladesh: a SEM-Neural network approach. Technology in Society

Albahri AS, Albahri OS, Zaidan AA, Alnoor A, Alsattar HA, Mohammed R, Ahmed MA (2022) Integration of fuzzy-weighted zero-inconsistency and fuzzy decision by opinion score methods under a q-rung orthopair environment: a distribution case study of COVID-19 vaccine doses. Comput Stand & Interfaces 80:103572

Albahri AS, Alnoor A, Zaidan AA, Albahri OS, Hameed H, Zaidan BB, ... Yass AA (2021) Based on the multi-assessment model: towards a new context of combining the artificial neural network and structural equation modelling: a review. Chaos, Solitons & Fractals 153:111445

Alhamdi M, Noor RMAS, Abdulla M, Alnoor A, Eneizan B (2019) How does financial analysis influence the firm's failure of Iraqi private sector? J Soc Sci Res 5(9):1321–1328

Alharbi R, Alnoor A (2022) The influence of emotional intelligence and personal styles of dealing with conflict on strategic decisions. PSU Res Rev, (ahead-of-print)

Alkawsi GA, Ali N, Mustafa AS, Baashar Y, Alhussian H, Alkahtani A, Ekanayake J (2020) A hybrid SEM-neural network method for identifying acceptance factors of the smart meters in Malaysia: challenges perspective. Alex Eng J

Alnoor A (2020) Human capital dimensions and firm performance, mediating role of knowledge management. Int J Bus Excel 20(2):149–168

Alnoor AM, Al-Abrrow H, Abdullah H, Abbas S (2020) The impact of self-efficacy on employees' ability to accept new technology in an Iraqi university. Glob Bus Organ Excel 39(2):41–50

Alnoor A, Abdullah HO, AL-Abrrow H, Wah Khaw K, Al-Awidi IA, Abbas S, Omrane A (2021) A Fuzzy Delphi analytic job demands-resources model to rank factors influencing open innovation. Transnatl Corp Rev, 1–15

Alnoor A, Al-Abrrow H, Al Halbusi H, Khaw KW, Chew X, Al-Maatoq M, Alharbi RK (2022) Uncovering the antecedents of trust in social commerce: an application of the non-linear artificial neural network approach. Compet Rev 32(3):492–523

Alsalem MA, Mohammed R, Albahri OS, Zaidan AA, Alamoodi AH, Dawood K, Jumaah F (2022) Rise of multiattribute decision-making in combating COVID-19: a systematic review of the state-of-the-art literature. Int J Intell Syst 37(6):3514–3624

Atshan NA, Al-Abrrow H, Abdullah HO, Khaw KW, Alnoor A, Abbas S (2022) The effect of perceived organizational politics on responses to job dissatisfaction: the moderating roles of self-efficacy and political skill. Glob Bus Organ Excel 41(2):43–54

Davis FD (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q 13(3):319

Davis FD (1985) A technology acceptance model for empirically testing new end-user information systems: theory and results. Doctoral dissertation, Massachusetts Institute of Technology. Accessed in January 2015

Duan SX, Deng H (2021) Hybrid analysis for understanding contact tracing apps adoption. Ind Manag & Data Syst 121(7):1599–1616. https://doi.org/10.1108/IMDS-12-2020-0697

Eneizan B, Mohammed AG, Alnoor A, Alabboodi AS, Enaizan O (2019) Customer acceptance of mobile marketing in Jordan: an extended UTAUT2 model with trust and risk factors. Int J Eng Bus Manag 11:1847979019889484

Fadhil SS, Ismail R, Alnoor A (2021) The influence of soft skills on employability: a case study on technology industry sector in Malaysia. Interdiscip J Inf, Knowl, Manag 16:255

Guoqiang et al. (2022) Revisiting TAM2 in behavioral targeting advertising: a deep learning-based dual-stage SEM-ANN analysis. Revisiting TAM2 in behavioral targeting advertising: a deep learning-based dual-stage SEM-ANN analysis

Hadi AA, Alnoor A, Abdullah HO (2018) Socio-technical approach, decision-making environment, and sustainable performance: role of ERP systems. Interdiscip J Inf, Knowl, Manag 13:397

Hamid RA, Albahri AS, Alwan JK, Al-Qaysi ZT, Albahri OS, Zaidan AA, ... Zaidan BB (2021) How smart is e-tourism? a systematic review of smart tourism recommendation system applying data management. Comput Sci Rev 39:100337

Huang Y-C, Chang LL, Yu C-P, Chen J (2019) Examining an extended technology acceptance model with experience construct on hotel consumers' adoption of mobile applications. J Hosp Mark & Manag 28(8):957–980. https://doi.org/10.1080/19368623.2019.1580172

Jabbar AK, Almayyahi ARA, Ali IM, Alnoor A (2020) Mitigating uncertainty in the boardroom: analysis to financial reporting for financial risk COVID-19. J Asian Financ, Econ Bus 7(12):233–243

Khaw KW, Alnoor A, Al-Abrrow H, Chew X, Sadaa AM, Abbas S, Khattak ZZ (2022a) Modelling and evaluating trust in mobile commerce: a hybrid three stage Fuzzy Delphi, structural equation modeling, and neural network approach. Int J Human–Computer Interact, 1–17

Khaw KW, Alnoor A, Al-Abrrow H, Tiberius V, Ganesan Y, Atshan NA (2022b) Reactions towards organizational change: a systematic literature review. Curr Psychol, 1–24

Li F, Aw ECX, Tan GWH, Cham TH, Ooi KB (2022) The Eureka moment in understanding luxury brand purchases! a non-linear fsQCA-ANN approach. J Retail Consum Serv 68:103039

Lo PS, Dwivedi YK, Tan GWH, Ooi KB, Aw ECX, Metri B (2022) Why do consumers buy impulsively during live streaming? a deep learning-based dual-stage SEM-ANN analysis. J Bus Res 147:325–337

Naqvi M, Li S, Jiang Y, Naqvi MHA (2019) The rise of social networking sites. Asia Pac J Mark Logist 32(1):232–252. https://doi.org/10.1108/APJML-01-2019-0029

Pipitwanichakarn T, Wongtada N (2019) Leveraging the technology acceptance model for mobile commerce adoption under distinct stages of adoption. Asia Pac J Mark Logist, ahead-of-print(ahead-of-print). https://doi.org/10.1108/APJML-10-2018-0448

Ramírez-Correa P, Rondán-Cataluña FJ, Arenas-Gaitán J, Martín-Velicia F (2019) Analysing the acceptation of online games in mobile devices: an application of UTAUT2. J Retail Consum Serv 50:85–93

Scherer R, Siddiq F, Tondeur J (2018) The technology acceptance model (TAM): a meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. Comput & Educ. https://doi.org/10.1016/j.compedu.2018.09.009

Sharma SK, Al-Badi A, Rana NP, Al-Azizi L (2018) Mobile applications in government services (mG-App) from user's perspectives: a predictive modelling approach. GovMent Inf Q

Singh S, Srivastava P (2019) Social media for outbound leisure travel: a framework based on technology acceptance model (TAM). J Tour Futur 5(1):43–61. https://doi.org/10.1108/JTF-10-2018-0058

Singh S, Sahni MM, Kovid RK (2020) What drives FinTech adoption? a multi-method evaluation using an adapted technology acceptance model. Manag Decis, ahead-of-print (ahead-of-print). https://doi.org/10.1108/MD-09-2019-1318

Sukendro S, Habibi A, Khaeruddin K, Indrayana B, Syahruddin S, Makadada FA, Hakim H (2020) Using an extended Technology Acceptance Model to understand students' use of e-learning during Covid-19: Indonesian sport science education context. Heliyon 6(11):e05410

Wah KK, Omar AZ, Alnoor A, Alshamkhani MT (2022) Technology application in tourism in Asia: comprehensive science mapping analysis. In Technology Application in Tourism in Asia (pp. 53–66). Springer, Singapore

Zhong Y, Oh S, Moon HC (2021) Service transformation under industry 4.0: Investigating acceptance of facial recognition payment through an extended technology acceptance model. Technol Soc 64:101515

Fawaz Jumaah is professional embedded systems engineer with eight years of experience in embedded system design, hardware design, FPGA, ARM SoC, embedded Linux, and uC-OS II RTOS development. He has successfully achieved 12 projects during career with impactful business values. He is creative, flexible, motivated with active optimism, and believe in diversity and inclusion. He received a Master of Science in Computer and Embedded Systems Engineering, from Universiti Putra Malaysia, Selangor. Currently, he is a senior deep-learning validation engineer at Intel Corporation, Canada.

Sani Salisu is a lecturer in the Department of Information Technology, Federal University Dutse, Jigawa State, Nigeria. He is now a PhD student in computer science at the Universiti Sains Malaysia. He is a researcher, who has published research in various journals. He serves as a reviewer for many journals. He can be reached at sani.salisu@fud.edu.ng.

Shahad Alfahad is a lecturer at the Southern Technical University, Management Technical College. She received her MBA from the Southern Technical University. Her research interests lie in organizational studies.

Social Commerce of Rural Communities

Abdullah Mohammed Sadaa, Yuvaraj Ganesan, Sammar Abbas, Tha'er Majali, and Alyaa Abdulhussein Kareem Alsaedi

1 Introduction

Social commerce is relatively a new phenomenon in the field of electronic commerce and has evolved as a result of the rapid expansion of social networking sites (Goldenberg et al. 2010). It has emerged as an extensive growth of social networking sites (SNSs). Social commerce is regarded as a primary instrument for online shoppers to share their experiences through peer connections (Lin et al. 2017). Social commerce improves consumers' online information sharing and suggestions, and helps in obtaining the best prices (Mirkovski et al. 2019; Zheng et al. 2017). In this way, social commerce is a combination of e-commerce and SNSs that intends to enhance shoppers' online experiences (Algharabat and Rana 2021). According to Lal (2017), s-commerce is the most recent way of combining information and technology. It refers to the application of social media and networking technology, as well as Web 2.0 technology to improve interactions through online platforms. S-commerce not only influences customers' purchase intentions and online purchase decision but also helps in other marketing activities like branding, advertising, customer relationship management (CRM), and other promotional activities. This also refers to sharing commerce (Lin et al. 2019; Tajvidi et al. 2020; Yusuf et al. 2018). In recent times with the development in the field of s-commerce, sharing commerce has also

A. M. Sadaa (✉) · Y. Ganesan
Graduate School of Business, Universiti Sains Malaysia, Penang, Malaysia
e-mail: abdullah1995@student.usm.my

S. Abbas
Institute of Business Studies, Kohat University of Science and Technology (KUST), Kohat, Pakistan

T. Majali
Faculty of Business, Applied Science Private University, Amman, Jordan

A. A. Kareem Alsaedi
School of Industrial Technology, Universiti Sains Malaysia, Penang, Malaysia

gained popularity as it offers much collaborative and interactive opportunities for online business activities (Bugshan and Attar 2020). This has become possible due to online information sharing, which enables companies and consumers to co-create value through collaboration in branding, marketing, manufacturing, and sales (Wang et al. 2020a, 2020b).

Firms now interact with clients using online networking websites to obtain feedback on products and services. This involvement represents a transformation of traditional business model into s-commerce (Grange et al. 2020; Shanmugam et al. 2016). Thus, connecting customers has become a priority for businesses, and managers are inventing ways to provide voice to the silent consumers (Cova and White 2010). This is due in part to the fact that customers are increasingly building online communities to engage with one another and share their respective online purchase experiences (Phang et al. 2009). As a result, we describe social commerce as a redesigned form of e-commerce in which social cooperation plays an important role. The merchant's ultimate purpose in social commerce is to increase client loyalty, whereas the buyer's ultimate goal is the capacity to make informed purchase decisions (Lin et al. 2017). Social commerce is estimated to receive an annual investment of over $48 billion (S. Kim and Park 2013). Despite the enormous importance of social commerce, research in this area is still in infancywa1QQ (Ali et al. 2020).

Earlier research in the area has claimed various factors related to social commerce. Many of the previous studies have focused on trust, privacy, education, perceived quality, time savings, discount pricing, convenience, competitive pricing, expert advice, increased access to information, quality of credibility, website quality, perceived risk, failure to handle complaints, inefficiency of product repair, and inadequate response to customer complaints, etc.… (Bugshan and Attar 2020; Hajli et al. 2015; Khaw et al. 2022; Xu et al. 2020) as important factors to influence social commerce activities. Also, a number of earlier studies have investigated the relationship between customer intentions and social commerce. Moreover, previous research streams have predicted the trust and customers' intentions as major determinants of social commerce (Alnoor et al. 2022; Ng et al. 2022; Tariq et al. 2021; Wang et al. 2022). However, according to Mangold and Faulds (2009), many internet users believe that online purchase is dangerous and unreliable. Because customers cannot view the items in person when buying online, the risks are larger than in a physical retail context. Also, in the absence of physical availability, there are concerns about the quality, security, and privacy leading to risk in online purchase (Pelaez et al. 2019; Regner and Riener 2017; Stouthuysen et al. 2018). Reduced sales and poor buy and repurchase intentions are among the negative outcomes of rising perceived risk (Chiu et al. 2018; Z. Yang et al. 2019). Customers are more likely to purchase low-value products and services due to reduced trust in social commerce (Maia et al. 2018).

2 Social Commerce Definition and Background

This section presents an overview of social commerce, traces its development historically, and summarizes the key ideas.

2.1 Social Commerce Definition

S-commerce, often known as social business, has been defined variously (Liang et al. 2011). Generally, it is defined as the use of online networks to allow individuals to exchange information about services and products in online markets and communities (Zhou et al. 2013). Social commerce, which permits increased participation and involvement of and among consumers through blogs, encyclopedia systems, and the publication of articles created by community members themselves, has been categorized by some as a development of Web 2.0 in online commerce (Busalim and Hussin 2016). On the other hand, social commerce is regarded as a transformation of conventional electronic commerce. Social commerce is the delivery of electronic commerce events and activities through the social media platforms, primarily through social networks and Web 2.0 technologies (Yahia et al. 2018). Sharma and Crossler (2014) defined social commerce as a subclass of e-commerce that involves the use of social networks to promote social engagement for the online purchase and sale of goods and services. Cheng et al. (2021a, 2021b) claim that s-commerce is a word-of-mouth idea that has been applied to e-commerce and consists of a combination of retailer's products and online customer participation. Yadav et al. (2013) described social commerce in terms of an exchange-related activity that takes place between and are impacted by the presence of online users' networks in computer-mediated social situations, where its activities correlate to the need acknowledgment, pre-purchase, purchase, and post-purchase phases. According to Tzavlopoulos et al. (2019), both customers' and companies' actions fall under the purview of the s-commerce domain. As a result, interactions between consumers before, during, and after transactions combine with marketing campaigns aimed at promoting such s-commerce activities. Users can engage in online marketing and sales activities by connecting to networks through social media platforms like Facebook, Instagram, and LinkedIn (Sohaib et al. 2018). Table 1 presents some important definitions of social commerce.

2.2 Social Commerce Development

Three major trends can be used to categorize social commerce: the inclusion of commercial elements in social media apps (such as SNSs), the incorporation of social networking components into online shopping platforms (such as Amazon), and the growing utilization of social media by traditional offline firms to enhance

Table 1 Previous research' conceptions of social commerce

No	Definition	Rescore
1	The use of network media to enable individuals to engage in the selling, purchasing, comparing, and communicating of information about goods and services in online markets and communities	(Zhou et al. 2013)
2	The delivery of electronic commerce events and activities via social media, particularly via social networks and Web 2.0 technologies	(Yahia et al. 2018)
3	A subcategory of electronic commerce in which social networks are used to facilitate social contact for the online order and selling of products and services	(Shwadhin Sharma and Crossler, 2014)
4	A word-of-mouth concept applied to internet commerce in the sense that it combines store merchandise with online customer participation	(Cheng et al. 2021a, 2021b)
5	The exchange-related activities performed by and influenced by users on social media in computer-mediated social situations, where the activities correspond to the need recognition, pre-buy, purchase, and remark phases of a focused transaction	(Yadav et al. 2013)
6	A form of internet commerce, like Twitter, Facebook, and Instagram, that enables social interaction between retailers and customers	(Sohaib et al. 2018)
7	Using social networks through a corporate interactive platform to do business in a collaborative and participatory manner	(Lo et al. 2022)
8	Individuals may use Internet-based media to promote, sell, compare, curate, purchase, and share items and services including both offline and online markets and communities	(Khaw et al. 2022)
9	Social commerce and social shopping are Internet-based "social media" that allow users to actively participate in the promotion and selling of products and services in online marketplaces and communities	(Bugshan and Attar 2020)
10	Social commerce refers to the use of social media in the field of electronic commerce or even mobile purchasing	(Williams 2021)

business operations (such as customer service) (Khwaja and Zaman 2020; Liang et al. 2011). The platform for social commerce is social media, which focuses on users' interactive online buying through information sharing with a focus on boosting customer loyalty and WOM advertising (Trusov et al. 2009; Wang and Chang 2013).

According to Maia et al. (2018), the two pioneering e- commerce businesses, Amazon, and eBay offered features that let users post evaluations on items or score

the seller's performance in the late 1990s. These capabilities gave rise to the notion of social commerce (Busalim and Hussin 2016). In order to define a new cooperative shopping function on its online purchase that lets users build, share, and comment on product lists, Yahoo coined the phrase "social commerce" in 2005. (Maia et al. 2018). As Web 2.0 and social media grew in popularity, e-commerce businesses started incorporating contemporary technology into their websites to provide customers a more social and interactive buying experience (Yusuf et al. 2018). The widespread use of social media technology has made it possible for consumers to actively participate in online social community and share their thoughts and experiences with various brands and goods with friends and other consumers (Sheikh et al. 2019). The phrase "social commerce" was first used in scholarly publications in 2007. When flowers.com launched the first Facebook store in 2009, it was essentially the first official meal of social commerce (Busalim and Hussin 2016).

3   Rural/Rustic Community Concept

The residents in a specific region make up the community (Salamon 2003). It might be a group of people who share a common vocation, job, trade, or even a common passion in a specific sport or religion. A community, according to Desjardins (2013), is a collection of individuals who live and work together and have similar sociocultural, political, or economic backgrounds. A community's geographical and physical limits give it a distinct sense of seclusion, and its social and cultural homogeneity shows a range of shared behaviors and interactions. A community, according to Ochepo (2019), is a group of distinguishable groups of people who reside together in a single geographic area and are connected by a common set of values, expectations, aspirations, identities, and destiny. They also pursue shared political, social, financial, and related goals in a setting of collaboration, cooperation, and teamwork regardless of observable differences (Cheah et al. 2013). A rural community is made up of people who lead rural or rustic lifestyles. Rural places tend to have lesser inhabitants and an agricultural environment, while some feature woods. Rural refers to any place that is not regarded as urban. Rural communities can determine a territory, while rural areas are defined differently by different countries and regions. The term "rural" is therefore difficult to define. Low population in comparison to more metropolitan locations is the most noticeable characteristic of rural settlements (Sicat 2016; Tariq et al. 2021). Rural areas are frequently seen as peaceful, undeveloped, and remote, indicating a haven from the concerns of the contemporary world (Lamie et al. 2011).

Currently, 3 billion people reside in developing nations' rural areas, and this figure will keep rising until 2030 (Cui et al. 2019). Given that a sizeable number of these people continually struggle with a variety of concerns including poverty, a lack of access to healthcare and education, immigration to cities, rural petering, and emptiness problems, rural development has been a recurring issue in emerging nations (Malecki 2003).

4 Social Commerce in Rural/Rustic Communities, Perceived Risk and Trust

The introduction of electronic commerce and its development into social commerce, which is dependent on social platforms, gives developing nations a practical method for problem-solving and the tools to improve their lives, which benefits the developing world (Cui et al. 2019). As Leong et al. (2020) indicated that s-commerce is one of most obvious instances of how Information and Communication Technologies (ICTs) may help the economic growth. (Cheung et al. 2008). It aids nations in increasing trade effectiveness and makes it easier for emerging nations to join the world economy. It enables companies to compete more effectively. Additionally, it generates income by producing jobs (Datta 2011). Numerous studies have emphasized the beneficial influence social commerce plays in decreasing the socioeconomic issues in emerging nations (Cui et al. 2017; Lawrence and Tar 2010).

However, there are numerous significant barriers that prevent rural areas in underdeveloped nations from partaking in social trade. The majority of rural areas lack favorable technological, social, cultural, and legal conditions for the implementation of social commerce (Hajli 2013). Lack of enough technology, money, knowledge, labor, and other resources required for social trade is one effect of the unfavorable environment (Blasio 2008; Cui et al. 2017). Additionally, most rural residents frequently lack the favorable attitudes necessary to adopt social commerce, such as understanding its significance (Cui et al. 2019), acquiring beneficial items, promoting products online, and timely communication with and servicing of online clients (Jun Liu et al. 2020). Consequently, they struggle to engage in social commerce activities (Cui et al. 2017; Malecki 2003). In certain nations, even educated individuals in rural regions cannot use computers and mobile devices, and there are social commerce-specific issues including pervasive poverty, poor income, and unemployed in rural areas as well as issues with ICT access and internet penetration (Sicat 2016).

Moreover, although consumers are switching from electronic commerce to social commerce, the adoption levels are still low. Also, social commerce is still new and developing, so customers need information about the availability of products and services on these platforms (Chen et al. 2018). Therefore, the information available to consumers will create perceptions that will influence decisions to adopt social commerce (Bocean et al. 2018). In this regard, Sharma and Kurien (2017) indicated that risk perceptions have a significant impact on customer decisions to adopt social commerce to meet his/her needs for goods and services (Lăzăroiu et al. 2020). In the following, we review the concept of perceived risk in social commerce.

5 Perceived Risk

Bauer (1964, 1967), a Harvard academic, was the first to introduce the idea of perceived risk in the study of consumer behavior. According to Bauer (1967), perceived risk is "a mix of uncertainty and severity of consequence involved". Peter and Ryan (1976) defined that the anticipation of losses linked with purchases is a perceived risk that "acts as a barrier to buying behavior". The concept of perceived risk has been primarily addressed and described as a pertinent situational and distinctive contextual characteristic by academics in social commerce studies (Lin et al. 2017). Many of the scholars agree with Pavlou (2003) definition of perceived risk, which states that it is the "possibility of loss in the pursuit of the desired goal of using an e-service" in the context of social commerce. Bashir et al. (2021) narrate that perceived risk refers to the possibility that a customer may lose money on a transaction made through a social commerce network. Fresh e-commerce platforms, as a new way to make purchases, cause customers to worry about the uncertainty around product quality, delivery timeliness, payment security, and other factors. Thus, the perceived risk influences the consumer's intention to buy. Alalwan et al. (2017) asserted that customers' desire to transact business is significantly hampered by perceived risk. Therefore, in the new social commerce platforms, customers' perception of risk influences their desire to make a purchase (Chen et al. 2021). Here, consumers' fear of losing money would keep them away from making purchases on the new social commerce site (Busalim et al. 2021). Thus, expectations of uncertainty and potential outcomes from purchases of products and services, fraud, and product quality are all related to perceived risk (Forsythe and Shi 2003; Rouibah et al. 2016). The consumer's misperception that the online retailers would not adhere to security rules is also relevant (Rouibah et al. 2021). These online sellers are primarily small firms operating in the social commerce space without the aid of middlemen or third parties. They lack a strict return policy and fewer customer service expertise than large businesses. Customers may thus experience variety of risk in the form of poor quality of product, lack of good feel about product, after-sale service, etc.

Furthermore, the theory of customers' perceived risk contends that customers sense risk because they may experience uncertainty and unfavorable outcomes as a result of their purchases (Lu et al. 2016). As a result, people are less inclined to acquire the more danger they feel. However, customers frequently use risk-reduction tactics including gathering information before making purchases (Ashoer and Said 2016). Due to the fact that "consumers are more frequently driven to prevent mistakes than to maximize value in purchase", perceived risk is effective at explaining consumer behavior (Muhammad et al. 2021). Studies indicate that customers' approval of social commerce platforms for buying depends on their perception of risk (Chen et al. 2021). Because they are unable to physically see or evaluate the quality, size, or design of different products, customers who purchase on social commerce platforms sense danger (Hanafizadeh et al. 2014). Additionally, consumers perceive risk due to the possibility of time loss or dissatisfaction in the event that their purchases are failed (Forsythe and Shi 2003). As a result, it is likely that internet buying involves a

variety of perceived risks. Because of the open and complicated nature of the Internet and associated technologies, as well as the presence of multiple Internet suppliers, the technologies are out of anyone's control (Cova and White 2010).

Taking into account the exogenous impact of perceived risk, which is made up of behavioral and environmental uncertainty, there are two types of risk: (1) system-dependent uncertainty risk caused by functional flaws, deposit costs, or security issues in online payments; (2) transaction-specific uncertainty risk caused by the actions of various parties involved in the online transaction (Bélanger and Carter 2008; Sharma and Kurien 2017).

Deliberately developed uncertainty risk is referred to as an independent factor because it is linked to payment risk disclosure and its unpredictability associated with unpredicted online payment advanced technologies, such as potential technical sources of errors, low current functions, time needed input, and security holes, all of which are outside of the control of online payment servers or customers (Bélanger and Carter 2008; Featherman and Pavlou 2003; Yousafzai et al. 2003). Market uncertainty, on the other hand, is viewed as an endogenous variable resulting from multiple parties' actions based on asymmetric knowledge and an opportunism approach among them by trying to take advantage of a distant and impersonal online environment (Tzavlopoulos et al. 2019; Vos et al. 2014; Yang et al. 2015). According to various definitions and specific elements, transactional risks which are endogenous risks as they primarily reflect uncertainties brought on by potential wrongdoings of various parties participating in the transaction are assigned with the economic, security, service, and emotional risks (Cocosila and Trabelsi 2016).

Furthermore, the kind and degree of danger that a buyer perceives when considering a certain purchase activity is the basic definition for perceived risk in marketing (Danisa et al. 2017). However, companies must recognize the consequences of various categories of risk if they are to focus their resources in the proper areas to lower customers' perceptions of risk (Biucky et al. 2017). Researchers have found the following (nine) aspects of perceived risk.

1. Financial risk or economic risk refers to potential financial loss as a result of internet buying. For instance, untrustworthy vendors may supply subpar or even nonexistent goods to customers. In certain circumstances, people spend money for fixing broken items. Alternately, when people make purchases online, their credit card information may be taken away and misused (Shavneet Sharma et al. 2022).
2. Performance risk is the likelihood that the acquired goods will not function correctly or will only be usable for a short time (Hong and Yi 2012).
3. Social risk relates to how consumers see other people in relation to their online buying activity (Miranda and Duarte 2022). It is possible that other members of society will not tolerate consumers' purchasing habits.
4. Psychological risk is the likelihood that people would experience mental stress as a result of their online purchase (Sharma and Kurien 2017). Customers, for instance, may experience frustration if their purchases are unsuccessful to satisfy the needs.

5. Time-loss risk is the probability that people would run late as a result of their shopping habits (Guru et al. 2020). This dimension covers time spent waiting for things to arrive and time spent sending back items that weren't suitable.

6. Personal risk is the likelihood that people may suffer negative consequences as a result of their purchasing habits. For instance, individuals can suffer if the information from their credit cards is taken away (Um 2019).

7. Privacy risk is the chance that internet firms would gather personal data about people and utilize them improperly (Bugshan and Attar 2020). This aspect of risk includes the covert collection of data, such as customer-buying patterns.

8. Source risk is the chance that people would suffer as a result of unreliable companies selling their products online (Tian et al. 2022).

9. Security risk occurs when customers worry about security against the loss of personal information and security against the service's context secrecy (Chauhan et al. 2019).

According to Lopez-Nicolas and Molina-Castillo (2008), electronic commerce should take into account technological risk, service risk, and delivery risk as well. However, security risk pertaining to the security of money transfers in online transactions should include technical risk and delivery risk.

6 Perceived Trust

People might rely on the experiences of others to shape their own experiences mostly because of the distant nature of s-commerce sources generated by a lack of face-to-face contact (Sharma et al. 2021). In order to establish confidence in unidentified parties, some people mistakenly believe that the Internet is a reliable source of information and instead depends on personal recommendations, forum and community evaluations, and ratings (Abdullah et al. 2022; Alnoor et al. 2022; Stouthuysen et al. 2018). People could feel anxious about online transactions owing to numerous hazards (Rosillo-Díaz et al. 2020). However, in social commerce, trust is a key concept that may help to uncover an important beneficial outcome, such as buying intentions, electronic word of mouth (eWOM), commitment, and revisit intention. Consumers may feel more at ease and less worried about the risks associated with utilizing s-commerce if there is a culture of trust (Lin et al. 2019). Therefore, it is believed that a person's reliance on another, with the expectation that their judgment and decisions will be sound and trustworthy. Other researchers support the emotional component of trust, having faith it to be the consequence of a person's emotion-driven attachment to a seller with the expectation that his judgment and decision will be sound and trustworthy (Lin et al., 2017; Sadaa et al., 2022a). Trust in social commerce enterprises, which depends on social networking websites where users may exchange a variety of information, is essential since it lowers ambiguity and risk in online commercial transactions (Beyari and Abareshi 2019). In this regard,

previous studies showed that researchers have identified the following strategies as a sources of customer trust in social commerce platforms.

6.1 Education

Facilitating learning, or the acquisition of information, skills, values, morals, beliefs, practices, and personal growth, is what is meant by education (Jalal et al. 2011). Education is inherently seen as a crucial component that influences online purchasing and social commerce behavior since it is generally favorably connected with an individual's income and technology/internet literacy. Unsurprisingly, marketing studies have emphasized the importance of education levels on purchasing decisions made through social commerce (Sharma and Kurien 2017). In general, education will improve people's knowledge and information handling skills, which can increase social trust (Keefer and Knack 2008). According to Huang et al. (2011) meta-analysis, a person's social trust might rise by 4.6% of the standard error for every extra year of schooling. Additionally, trust in the United Kingdom is strongly influenced by education (Leong et al. 2020). Huang et al. (2011) found that people with a college or graduate degree had higher levels of e-business technologies than those without a degree, showing that education fosters a more favorable attitude than managing teams with technology. This indicates that those with training or education are more likely to grasp when and how to utilize technology, as well as how to use it successfully and how to integrate it into their organizational responsibilities.

6.2 Information Credibility

Information credibility is defined as the audience members' opinion of the information's reliability. Consumers are more likely to interact in these ways when they believe an advocate is trustworthy (Ali et al. 2020). Since there are no face-to-face interaction as a result of the expansion of the virtual world, consumers have an unchanging freedom to communicate their experiences; yet, it is impossible to determine the veracity of such communication (Reichelt et al. 2014). In other words, because the majority of content is created by anonymous users, there is less familiarity. Additionally, a message recipient's level of trust in the sender is referred to the source information credibility. The receiver's level of belief in the assertions made by the message source is influenced by their attitude toward the message source (Bélanger and Carter 2008). Another crucial element influencing the efficacy of persuasion is this believability (Hovland and Weiss 1951). Customers will accept the message if the source is reliable. Credibility is therefore measured by how closely the message adheres to reality following the consumer's assessment (Wu and Wang 2011). According to Zha et al. (2018), information credibility is crucial for making decisions, especially in the murky online world (Mak et al. 1997) since the sender's

credibility increases the recipient's reception of the information (Ohanian 1990). Credibility of a business or brand may reduce anticipated expenses and perceived risk while increasing brand preference (Erdem and Swait 2004). More precisely, several academics have suggested that the key elements of source credibility are reliability, competence, and attractiveness (Ali et al. 2020; Wu and Wang 2011). The trustworthiness of a communication is measured by the level of trust and respect that the recipient has for the message's sender. Expertise is the term used to describe the sender's technical product expertise. When a sender entices recipients to purchase goods or services, this is referred to as attractiveness (Ohanian 1990).

6.3 Website Quality

Customers' perception of a website's quality is determined by how well it functions and how frequently they visit it (Park et al. 2007). Maintaining good website quality helps to influence customer happiness and loyalty, encourage repurchase behavior, encourage the spread of e-WOM, and provide advantages from online activities (Kim and Lennon 2013). According to Laroche et al. (2005), a website's efficiency depends on both system and service functions. Customers that use a website can utilize it to easily overcome certain problems thanks to a solid system quality. By meeting users' expectations, a high level of service quality can assist users in efficiently deploying all of the website's features (Jiménez-Barreto and Campo-Martínez 2018). A website's quality will influence users' perceptions of it as a beneficial catalyst for social connections, allowing them to continue using it as a platform for information sharing (Phang et al. 2009; Tong et al. 2013). Users will be more likely to return to websites that efficiently deliver items and shopping information (Liang et al. 2011).

Social networking sites are mostly used for business purposes by social commerce (Liu and Yeh 2018). Numerous studies have demonstrated the significance of a high-quality website when conducting online business, including those on online retail (Liang and Chen 2009; Waemustafa and Sukri 2015), online government programs (Beldad et al. 2010), online education (Kohl and Wardropper 2022), and online ticket purchasing (Goldenberg et al. 2010). Additionally, websites are essential to businesses' growth since they serve as a conduit of communication between the business and its clients (Kleinlercher et al. 2018). Therefore, businesses should determine the factors that affect the performance of website operations (Cenfetelli et al. 2008). According to Yang et al. (2015), important variables in the success of social commerce websites include quality of the information, service quality, system usage, fun, and system quality of design.

6.4 Information Quality

Information quality is the judgment and assessment that users make of the information, which is determined by the level of accuracy, the extent to which the information is actually able to inform, and the relevance (utility) of the information made accessible by the website (Kim and Park 2013; Yusuf et al. 2018). According to Yusuf et al. (2018), it is the degree to which information about a product, brand, or business's qualities is valuable to consumers in terms of assisting their evaluation of the thing in question. Kim and Park (2013) provide support to this theory by stating that a customer's overall assessment of the website's information quality may be favorably correlated with their opinion of the website as interactive and searchable. Additionally, the high information quality of the members of the social commerce community establishes a benchmark for other participants to meet, which is an attainable objective rather than a source of pressure for other participants (Cheng et al. 2021a, 2021b). Wherein the individuals carefully evaluate the information provided in order to draw reliable judgments to control their behavior, these people are more susceptible to these arguments after they are convinced that the information is accurate (Hussain et al. 2017). They could voluntarily participate in social commerce communication as a result of such an endeavor.

On the other side, processing low-quality information results in more time, money, and effort spent reading pointless messages (Gu et al. 2007). However, reliable information is advantageous to both clients seeking insightful knowledge on a certain subject and service providers that supply the information (Telle et al. 2011; Zheng et al. 2013). By providing top-notch information, service providers may improve their standing and public perception (Milan et al. 2015). Information quality has been characterized as a multi-dimensional term in a number of researches (Chen et al. 2017; Xu et al. 2013). However, different scholars have presented information quality categories such as correctness, timeliness, sufficiency, and dependability, etc. in different ways, and there are currently no standardized quality criteria.

6.5 Social Support

Social support is the belief held by a person that they are cared for and understood by their peers (Wang et al. 2020a, 2020b). Joining online communities for this kind of help and the sharing of product experiences is what encourages users to do so (Busalim et al. 2021). Consequently, the idea of social support is quite popular in social business (Hajli 2014, 2015). Many people consider social support to be a multi-dimensional concept made up of informational support, emotional support, and practical assistance (Schaefer et al. 1981). Online social support is intangible, though. Customers only receive information and emotional assistance in an online setting (Beyari and Abareshi 2019). Informational support is counsel or direction that assists customers in finding solutions to their issues and making knowledgeable decisions

(Liang et al. 2011). While emotional support helps the recipient feel appreciated, understood, and connected to the group as a whole, these two factors influence the social support available online.

Members of social commerce communities share knowledge and suggestions to solve issues and make wise judgments. They also communicate about emotional issues, such as compassion and understanding (Liang et al. 2011). They therefore experience social support, in accordance with the social support hypothesis (Huang et al. 2020), when they sense that other community members are concerned about and trying to help them (Molinillo et al. 2020). Users' perceptions of support may have a beneficial impact on their self-efficacy, or how well they believe they can carry out the actions necessary to achieve specific results (Gabler et al. 2021). This results in a feeling of well-being that includes, among other things, a decrease in the fear of making mistakes, more effective decisions, self-confidence, a sense of social integration, and an improvement in the pleasant mood state. Users are extremely likely to acquire a sense of reciprocal duty when they get social support, which will motivate them to help out their fellow local residents (Yang 2021).

Additionally, social support is essential to social commerce and is explained as follows:

Naturally, community members in a social network will exchange promotional content and suggestions along with other helpful information whenever there is social support (Liang et al. 2011). When a person notices that other members have been kind and helpful in providing useful information, they will be inspired to gather and share beneficial shopping information with other members (Zhou et al. 2013). Regularly exchanging helpful information will strengthen relationships and mutual trust among participants, which will eventually increase their desire to engage in business operations (Liang et al. 2011). Better buying decisions and the building of a helpful environment will result from the social support that social media provide (Leong et al. 2020). In essence, higher intents for social commerce will result from better and more widespread social support, which will in turn affect consumer behavior (Hajli et al. 2015). When a social community has social support, its members will get along better with one another and exchange helpful information with their peers. Regularly exchanging helpful information can boost friendships and trust, which will eventually help to achieve social commerce goals (Liang et al. 2011).

6.6 Innovativeness

Innovativeness is the extent to which a person adopts a new idea significantly earlier than others in his/her social network. Innovative consumers are far more likely to evaluate new goods or services favorably and to be persuaded to utilize them. This aspect of an individual's personality reveals how much he/she has embraced novel concepts and items in their own life. First adopters have the highest inherent innovativeness (Ahmed et al., 2021; Savas, 2017; Sadaa et al., 2022b). They define innate innovativeness as the degree to which an individual is open to new ideas and makes

innovative decisions without reference to the experiences shared by other people (Sadaa et al., 2020; Zhang and Hou 2017).

Two basic approaches to the concept—general innovativeness and creativeness applied to a particular domain—can be identified, despite the fact that numerous scholars have employed various ways to quantify innovation. According to Aldás-Manzano et al. (2009), general innovativeness is a major predictor of buying intention since it shows openness and a person's desire for novel experiences. Agarwal and Prasad (1998) created a measurement scale for innovativeness in a particular domain due to the degree of abstraction of the overall innovativeness concept. The propensity of a person to experiment with new goods, services, or procedures in his or her field of interest is known as domain-specific innovativeness. Domain-specific metrics outperform global innovativeness as predictors of new product purchases (Goldsmith and Hofacker 1991). Prior research has established that innovative consumers are at the forefront of experimenting with new goods and services and sharing their findings with others. Additionally, according to several research, there is a positive relationship between innovation and information seeking (Ali et al. 2020; Chauhan et al. 2019). This is also supported by an earlier study which suggests that social commerce platforms are often used by customers who are constantly willing to accept new concepts (Choi et al. 2020).

6.7 Altruism

An intriguing application of altruism research is in the setting of business activities (Alcántara-Pilar et al. 2018). Altruism is a concept or behavior that promotes the well-being of others. There are several definitions and kinds of altruistic motivation. For instance, altruism was described by Daugherty and Hoffman (2014) as a helpful or sharing activity that advances the well-being of others without consciously considering one's own interests. Powers and Hopkins (2006) define altruism as an innate propensity for a person to prioritize helping others. Although there isn't a single definition of altruism, most individuals who highlight its motivating side agree that it entails intentionally helping someone else without expecting anything in return (Cui et al. 2014) and having empathy for their needs (Jianfeng Liu et al. 2021). Man's nature compels him to support and assist others without expecting anything in return (Wasko and Faraj 2005). Online users frequently participate in social groups due to their altruistic goals (Baethge et al., 2016). Several studies have investigated altruism as a driver or motivator in spreading electronic word of mouth by consumers. For instance, Cheung and Lee (2012) consider altruism as a driver of consumers' electronic word-of-mouth intention in online consumer opinion platforms while Hennig-Thurau et al. (2004) also consider altruism as a motivator for individuals to express themselves on social commerce platforms. Altruism was recognized by Sundaram et al. (1998) as a driving force behind the propagation of favorable word-of-mouth advertising. Approximately 28.7% of electronic word-of-mouth interactions involved people acting out of altruism (Sundaram et al. 1998).

This is why we think that people's altruistic inclination makes them more willing to participate in positive discussion regarding social commerce platforms as a method of promoting adoption by others.

6.8 Sense of Belonging

The concept of sense of belonging was first arose in the domain of psychology. Psychologists state that emotion or experience of belonging is an internal affective or evaluative one (Bibb and Kourdi 2004). The sensation of personal connection in a system or environment that makes a person to feel as an essential component of that system or environment is known as a sense of belonging (Hagerty et al. 1992). In social commerce competitions, a user's sense of identification with or loyalty to a social networking site is measured by their sense of belonging. Online community studies have shown positive correlation between sense of belonging and product usage. (Cheung and Lee 2012). Liu et al. (2018) looked at the pleasures and shared identities that Facebook users obtain from its usage. Users of social media sites express themselves through their accounts, connecting with others who share their interests, and creating a sense of community with their contacts and friends. As a result, social networking sites let users become closer through connections and social bonds (Rosen et al. 2011). Users will be more motivated to keep using social networking sites when they feel more as a part of and connected to the site (Liang et al. 2011). According to Bagozzi's paradigm, users' coping strategies would be influenced by their sense of belonging as an emotional reaction element (Lin et al. 2014). Additionally, Hagerty et al. (1996) noted that maintaining social interactions among friends on social media platforms requires a strong psychological antecedent known as a sense of belonging. Online community studies have demonstrated the beneficial effect of belongingness on social media use and intention to stick with it (Lin et al. 2014).

6.9 Electronic Word-of-Mouth (eWOM)

eWOM has significant influence on customer decisions and is a crucial marketing strategy. It has been found that 76% of customers presently believe in peer reviews (Ali et al. 2020; Ismagilova et al. 2021). Consumers now rely heavily on word-of-mouth recommendations when determining if a product will satisfy their needs (Rouibah et al. 2021; Sohaib et al. 2018). As a result, informal verbal tactics such as suggestions are used to spread information rather than traditional marketing techniques like mass media (Nilashi et al. 2022). eWOM is described as "any good or negative comment made about a product or firm by potential, existing, or past consumers that is made available to numerous individuals and institutions over the Internet" (Hennig-Thurau et al. 2004). Both the buyers and the sellers contribute to

its creation. Social networking websites are viewed in this light as being suitable eWOM platforms. These websites enable opinion leaders to establish and promote profiles linked to the goods and services of businesses in addition to the regular dialogs among customers. Written words, images, videos, and even applications are ways through which people may convey their opinions. Visually enhanced material improves the quality and attractiveness of eWOM.

Social media platforms enable individuals to spread eWOM information, and users may even express their opinions by simply forwarding items that they concur with (Chu 2011). Due to these factors, customers are turning more frequently to social media to learn about companies (Nilashi et al. 2022; Yan et al. 2018). Additionally, there are several ways that eWOM information might appear via social media. Users are allowed to post about companies, their goods, or their services. Users may also reveal their preferences to their network by following certain businesses, engaging with their postings by like and commenting, or producing material that features those brands without any apparent commercial motive. Last but not least, advertisers also publish content on social networking networks through their official accounts (Ismagilova et al. 2021).

6.10   Self-Enhancement

Consumers' favorable self-perception is self-enhancement. To project the ideal impression on social media platforms, they self-fulfill their hedonistic desires of improving their self-status, self-image, and self-esteem (Abbassi and Sta 2019; Saiphoo et al. 2020). Their self-fulfilling feelings would boost their self-status and image in order to gain attention, and they would frequently use social media platforms (Ali et al. 2020; Alicke and Sedikides 2009; Wojnicki and Godes 2011). Social media interaction is well predicted by emotional bonds. Positive comments from users influence the feelings of other people (Erhardt et al. 2021; Jun Liu et al. 2020). Customers who are highly self-enhancing will have more self-esteem, and they will be more likely to share information and prominently display their status on social networking sites (Hennig-Thurau et al. 2004). Clients want to improve their sense of self-worth by leveraging their social media friend networks to endorse products and services and refer their family, friends, or other relatives for adoption (Chawla and Joshi 2019; Tong et al. 2013). Thus, these desires for self-improvement foster consumer interaction, which in turn encourages the adoption of social commerce. Individuals' self-representations in social interactions play a crucial part in self-enhancement in order to make favorable impressions and win the respect from others (Ali et al. 2020).

7 Conclusion

This chapter discussed social commerce in rural communities and highlights the determinants of customers' intentions toward online commerce in such communities. In addition, the factors that support trust in information have been discussed in the context of rural communities. Rural communities face a series of socioeconomic challenges. Social commerce can help rural communities as a powerful development instrument. Nevertheless, there are many serious obstacles to engaging in social commerce for the rural communities. Most rural communities lack a favorable technological, social, cultural, and legal environment for social commerce adoption. Because social commerce is such a large and multifaceted subject, its determinants are multifaceted. But a high perceived risk is widely recognized as one of the primary barriers toward the adoption social commerce. Furthermore, trust has been adopted as important to reduce uncertainty and risk in online business transactions, because the trust building in social commerce businesses and relying on social networking sites is critical.

References

Abbassi R, Sta N (2019) The effect of self-esteem, entrepreneurship education, and entrepreneurial tradition of the family on the entrepreneurial intention among students. J Bus Manag Res 12:235–245. www.knowledgejournals.com

Abdullah HO, Thajil KM, Alnoor A, Al-Abrrow H, Khaw KW, XinYing, Sadaa AM (2022) Predicting determinants of use mobile commerce through modelling non-linear. CentL Eur Bus Rev 11:0–24. https://doi.org/10.18267/j.cebr.306

Agarwal R, Prasad J (1998) A conceptual and operational definition of personal innovativeness in the domain of information technology. Inf Syst Res 9(2):204–215. https://doi.org/10.1287/isre.9.2.204

Ahmed MG, Aldhaher AAA, Abdulkdhim BT, Sadaa, AM (2021) SUSTAINABLE SUPPLY CHAIN'S EFFECT ON COMPETITIVE PERFORMANCE, A CASE STUDY IN AL BASRAH OIL COMPANY. Int. J. Entrepreneurship 25: 1–17.

Alalwan AA, Dwivedi YK, Rana NP (2017) Factors influencing adoption of mobile banking by Jordanian bank customers: extending UTAUT2 with trust. Int J Inf Manag 37(3):99–110. https://doi.org/10.1016/j.ijinfomgt.2017.01.002

Alcántara-Pilar JM, Blanco-Encomienda FJ, Armenski T, Del Barrio-García S (2018) The antecedent role of online satisfaction, perceived risk online, and perceived website usability on the affect towards travel destinations. J Destin Mark Manag 9(October 2015):20–35. https://doi.org/10.1016/j.jdmm.2017.09.005

Aldás-Manzano J, Lassala-Navarré C, Ruiz-Mafé C, Sanz-Blas S (2009) The role of consumer innovativeness and perceived risk in online banking usage. International Journal of Bank Marketing 27(1):53–75. https://doi.org/10.1108/02652320910928245

Algharabat RS, Rana NP (2021) Social commerce in emerging markets and its impact on online community engagement. Inf Syst Front 23(6):1499–1520. https://doi.org/10.1007/s10796-020-10041-4

Ali YS, Hussin ARC, Dahlan HM (2020) Electronic word of mouth engagement in social commerce platforms: An empirical study. Inf Dev 36(3):438–456. https://doi.org/10.1177/0266666919867488

Alicke MD, Sedikides C (2009) Self-enhancement and self-protection: What they are and what they do. Eur Rev Soc Psychol 20(1):1–48. https://doi.org/10.1080/10463280802613866

Alnoor A, Al-Abrrow H, Al Halbusi H, Khaw KW, Chew XY, Al-Maatoq M, Alharbi RK (2022) Uncovering the antecedents of trust in social commerce: an application of the non-linear artificial neural network approach. Compet Rev 32(3):492–523. https://doi.org/10.1108/CR-04-2021-0051

Ashoer M, Said S (2016) The impact of perceived risk on consumer purchase intention in Indonesia; a social commerce study. Manag, Econ Soc Sci (Icamess) May:1–14

Baethge C, Klier J, Klier M (2016) Social commerce—state-of-the-art and future research directions. Electron Mark 26(3):269–290. https://doi.org/10.1007/s12525-016-0225-2

Bashir S, Khwaja MG, Mahmood A, Turi JA, Latif KF (2021) Refining e-shoppers' perceived risks: development and validation of new measurement scale. J Retail Consum Serv 58(April 2020):102285. https://doi.org/10.1016/j.jretconser.2020.102285

Bauer, R. (1967). Consumer behaviour as risk taking. En Cox, D. (Ed.), Risk taking and information handling in consumer behavior. Cambridge, MA: Harvard University Press

Bélanger F, Carter L (2008) Trust and risk in e-government adoption. J Strat Inf Syst 17(2):165–176. https://doi.org/10.1016/j.jsis.2007.12.002

Beldad A, De Jong M, Steehouder M (2010) How shall I trust the faceless and the intangible? A literature review on the antecedents of online trust. Comput Hum Behav 26(5):857–869. https://doi.org/10.1016/j.chb.2010.03.013

Beyari H, Abareshi A (2019) The interaction of trust and social influence factors in the social commerce environment. In Advances in Intelligent Systems and Computing (Vol. 843). Springer International Publishing. https://doi.org/10.1007/978-3-319-99007-1_86

Bibb S, Kourdi J (2004) Building customer trust. Trust Matters 46(4):87–105.https://doi.org/10.1057/9780230508330_7

Biucky ST, Abdolvand N, Harandi SR (2017) The effects of perceived risk on social commerce adoption based on the tam model. International Journal of Electronic Commerce Studies 8(2):173–196. https://doi.org/10.7903/ijecs.1538

Blasio G De (2008) Urban-rural differences in internet usage, e-commerce, and e-banking: evidence from Italy. Growth Chang 39(2):341. http://search.proquest.com/docview/217590496?accountid=10297%5Cn; http://sfx.cranfield.ac.uk/cranfield?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&sid=ProQ:ProQ:abiglobal&atitle=Urban-Rural+Differences+in+Internet+Usage,+e-Com

Bocean CG, Sitnikov C, Tudor S (2018) Theoretical perspectives concerning modeling consumer behavior influences on CSR and marketing roles in shaping consumer perceptions. CSR, sustainability, ethics & governance (pp. 45–62). Springer. https://doi.org/10.1007/978-3-319-70449-4_4

Bugshan H, Attar, RW (2020) Social commerce information sharing and their impact on consumers. Technol Forecast Soc Chang 153(October 2019):119875. https://doi.org/10.1016/j.techfore.2019.119875

Busalim AH, Ghabban F, Hussin ARC (2021) Customer engagement behaviour on social commerce platforms: an empirical study. Technol Soc 64(August 2020):101437. https://doi.org/10.1016/j.techsoc.2020.101437

Busalim AH, Hussin ARC (2016) Understanding social commerce: a systematic literature review and directions for further research. Int J Inf Manage 36(6):1075–1088. https://doi.org/10.1016/j.ijinfomgt.2016.06.005

Cenfetelli RT, Benbasat I, Al-Natour S (2008) Addressing the what and how of online services: positioning supporting-services functionality and service quality for business-to-consumer success. Inf Syst Res 19(2):161–181. https://doi.org/10.1287/isre.1070.0163

Chauhan V, Yadav R, Choudhary V (2019) Analyzing the impact of consumer innovativeness and perceived risk in internet banking adoption: a study of Indian consumers. Int J Bank Mark 37(1):323–339. https://doi.org/10.1108/IJBM-02-2018-0028

Chawla D, Joshi H (2019) Consumer attitude and intention to adopt mobile wallet in India—an empirical study. Int J Bank Mark 37(7):1590–1618. https://doi.org/10.1108/IJBM-09-2018-0256

Cheah WS, Masli AB, Mit E (2013) Sustainability modelling of ecommerce for rural community: a case from long lamai Ezommerce initiative. Proceedings - 2013 International Conference on Informatics and Creative Multimedia, ICICM 2013, 282–287. https://doi.org/10.1109/ICICM.2013.75

Chen CC, Hsiao KL, Wu SJ (2018) Purchase intention in social commerce: an empirical examination of perceived value and social awareness. Library Hi Tech 36(4):583–604. https://doi.org/10.1108/LHT-01-2018-0007

Chen L, Rashidin MS, Song F, Wang Y, Javed S, Wang J (2021) Determinants of consumer's purchase intention on fresh e-commerce platform: perspective of UTAUT model. SAGE Open 11(2). https://doi.org/10.1177/21582440211027875

Chen X, Huang Q, Davison RM (2017) The role of website quality and social capital in building buyers' loyalty. Int J Inf Manage 37(1):1563–1574. https://doi.org/10.1016/j.ijinfomgt.2016.07.005

Cheng G, Cherian J, Sial MS, Mentel G, Wan P, Álvarez-Otero S, Saleem U (2021a) The relationship between csr communication on social media, purchase intention, and e-wom in the banking sector of an emerging economy. J Theor Appl Electron Commer Res 16(4):1025–1041. https://doi.org/10.3390/JTAER16040058

Cheng X, Gu Y, Hua Y, Luo X (Robert) (2021b) The paradox of word-of-mouth in social commerce: exploring the juxtaposed impacts of source credibility and information quality on SWOM spreading. Inf Manag 58(7). https://doi.org/10.1016/j.im.2021.103505

Cheung CMK, Lee MKO (2012) What drives consumers to spread electronic word of mouth in online consumer-opinion platforms. Decis Support Syst 53(1):218–225. https://doi.org/10.1016/j.dss.2012.01.015

Cheung CMK, Lee MKO, Rabjohn N (2008) The impact of electronic word-of-mouth: the adoption of online opinions in online customer communities. Internet Res 18(3):229–247. https://doi.org/10.1108/10662240810883290

Chiu TS, Chih WH, Ortiz J, Wang CY (2018) The contradiction of trust and uncertainty from the viewpoint of swift guanxi. Internet Res 28(3):716–745. https://doi.org/10.1108/IntR-06-2017-0233

Choi H, Park J, Kim J, Jung Y (2020) Consumer preferences of attributes of mobile payment services in South Korea. Telematics Inform 51(February):101397. https://doi.org/10.1016/j.tele.2020.101397

Chu S-C (2011) Viral advertising in social media. J Interact Advert 12(1):30–43. https://doi.org/10.1080/15252019.2011.10722189

Cocosila M, Trabelsi H (2016) An integrated value-risk investigation of contactless mobile payments adoption. Electron Commer Res Appl 20:159–170. https://doi.org/10.1016/j.elerap.2016.10.006

Cova B, White T (2010) Counter-brand and alter-brand communities: the impact of Web 2.0 on tribal marketing approaches. J Mark Manag 26(3–4):256–270. https://doi.org/10.1080/02672570903566276

Cui J, Wang L, Feng H, Teng Y (2014) Empirical study of the motivations of e-WOM spreading on online feedback system in China. *Proceedings* - Pacific Asia Conference on Information Systems, PACIS 2014

Cui M, Pan SL, Cui L (2019) Developing community capability for e-commerce development in rural China: a resource orchestration perspective. Inf Syst J 29(4):953–988. https://doi.org/10.1111/isj.12241

Cui M, Pan SL, Newell S, Cui L (2017) Strategy, resource orchestration and e-commerce enabled social innovation in rural China. J Strat Inf Syst 26(1):3–21. https://doi.org/10.1016/j.jsis.2016.10.001

Danisa TCE, Istiyanto B, Ardyana E (2017) The effect of electronic word of mouth, trust, perceived risk, and site quality on transactions using e-commerce. Int Conf "Sustainable Dev Goals 2030 ChallS Its Solut 1(August):191–208. www.startupbisnis.com

Datta P (2011) A preliminary study of ecommerce adoption in developing countries. Inf Syst J 21(1):3–32. https://doi.org/10.1111/j.1365-2575.2009.00344.x

Daugherty T, Hoffman E (2014) eWOM and the importance of capturing consumer attention within social media. J Mark Commun 20(1–2):82–102. Taylor & Francis. https://doi.org/10.1080/135 27266.2013.797764

Desjardins R (2013) The economics of adult education. New Dir Adult Contin Educ 2013(138):81–90. https://doi.org/10.1002/ace.20056

Erdem T, Swait J (2004) Brand credibility, brand consideration, and choice. J Consum Res 31(1):191–198. https://doi.org/10.1086/383434

Erhardt J, Freitag M, Filsinger M, Wamsler S (2021) The emotional foundations of political support: how fear and anger affect trust in the government in times of the Covid-19 pandemic. Swiss Polit Sci Rev 27(2):339–352. https://doi.org/10.1111/spsr.12462

Featherman MS, Pavlou PA (2003) Predicting e-services adoption: a perceived risk facets perspective. Int J Hum Comput Stud 59(4):451–474. https://doi.org/10.1016/S1071-5819(03)001 11-3

Filieri R, Hofacker CF, Alguezaui S (2018) What makes information in online consumer reviews diagnostic over time? the role of review relevancy, factuality, currency, source credibility and ranking score. Comput Hum Behav 80:122–131. https://doi.org/10.1016/j.chb.2017.10.039

Forsythe SM, Shi B (2003) Consumer patronage and risk perceptions in Internet shopping. J Bus Res 56(11):867–875. https://doi.org/10.1016/S0148-2963(01)00273-9

Gabler CB, Landers VM, Richey RG (2021) Benefits and challenges of developing an eco-social orientation: implications for marketing practice. Eur J Mark 55(4):1155–1176. https://doi.org/10.1108/EJM-05-2019-0400

Goldenberg J, Jedidi K, Koenigsberg O, Lehmann D, Watts D, Stephen AT, Toubia O (2010) The WIMI conference on Modeling Social Network Data for their helpful comments Deriving Value from Social Commerce Networks. J Mark Res XLVII(April):1547–7193

Goldsmith RE, Hofacker CF (1991) Measuring consumer innovativeness. J Acad Mark Sci 19(3):209–221. https://doi.org/10.1007/BF02726497

Grange C, Benbasat I, Burton-Jones A (2020) A network-based conceptualization of social commerce and social commerce value. Comput Hum Behav 108(August 2017):105855. https://doi.org/10.1016/j.chb.2018.12.033

Gu B, Konana P, Rajagopalan B, Chen HWM (2007) Competition among virtual communities and user valuation: the case of investing-related communities. Inf Syst Res 18(1):68–85. https://doi.org/10.1287/isre.1070.0114

Guru S, Nenavani J, Patel V, Bhatt N (2020) Ranking of perceived risks in online shopping. Decision 47(2):137–152. https://doi.org/10.1007/s40622-020-00241-x

Hagerty BMK, Lynch-Sauer J, Patusky KL, Bouwsema M, Collier P (1992) Sense of belonging: a vital mental health concept. Arch Psychiatr Nurs 6(3):172–177. https://doi.org/10.1016/0883-9417(92)90028-H

Hagerty BM, Williams RA, Coyne JC, Early MR (1996) Sense of belonging and indicators of social and psychological functioning. Arch Psychiatr Nurs 10(4):235–244. https://doi.org/10.1016/S0883-9417(96)80029-X

Hajli M (2013) A research framework for social commerce adoption. Inf Manag Comput Secur 21(3):144–154. https://doi.org/10.1108/IMCS-04-2012-0024

Hajli MN (2014) The role of social support on relationship quality and social commerce. Technol Forecast Soc Chang 87:17–27. https://doi.org/10.1016/j.techfore.2014.05.012

Hajli N (2015) Social commerce constructs and consumer's intention to buy. Int J Inf Manage 35(2):183–191. https://doi.org/10.1016/j.ijinfomgt.2014.12.005

Hajli N, Shanmugam M, Powell P, Love PED (2015) A study on the continuance participation in on-line communities with social commerce perspective. Technol Forecast Soc Chang 96:232–241. https://doi.org/10.1016/j.techfore.2015.03.014

Hanafizadeh P, Behboudi M, Abedini Koshksaray, A, Jalilvand Shirkhani Tabar M (2014) Mobile-banking adoption by Iranian bank clients. Telemat Inform 31(1):62–78.https://doi.org/10.1016/j.tele.2012.11.001

Hennig-Thurau T, Gwinner KP, Walsh G, Gremler DD (2004) Electronic word-of-mouth via consumer-opinion platforms: what motivates consumers to articulate themselves on the Internet? J Interact Mark 18(1):38–52. https://doi.org/10.1002/dir.10073

Hong Z, Yi L (2012) Research on the influence of perceived risk in consumer on-line purchasing decision. Phys Procedia 24:1304–1310. https://doi.org/10.1016/j.phpro.2012.02.195

Hovland CI, Weiss W (1951) The influence of source credibility on communication effectiveness. Public Opin Q 15(4):635–650. https://doi.org/10.1086/266350

Huang GQI, Chen YV, Wong IKA (2020) Hotel guests' social commerce intention: the role of social support, social capital and social identification. Int J Contemp Hosp Manag 32(2):706–729. https://doi.org/10.1108/IJCHM-04-2019-0380

Huang J, van den Brink HM, Groot W (2011) College education and social trust: an evidence-based study on the causal mechanisms. Soc Indic Res 104(2):287–310. https://doi.org/10.1007/s11205-010-9744-y

Hussain S, Ahmed W, Jafar RMS, Rabnawaz A, Jianzhou Y (2017) eWOM source credibility, perceived risk and food product customer's information adoption. Comput Hum Behav 66:96–102. https://doi.org/10.1016/j.chb.2016.09.034

Ismagilova E, Rana NP, Slade EL, Dwivedi YK (2021) A meta-analysis of the factors affecting eWOM providing behaviour. Eur J Mark 55(4):1067–1102. https://doi.org/10.1108/EJM-07-2018-0472

Jalal A, Marzooq J, Nabi HA (2011) Evaluating the impacts of online banking factors on motivating the process of e-banking. J Manag Sustain 1(1):32–42. https://doi.org/10.5539/jms.v1n1p32

Jiménez-Barreto J, Campo-Martínez S (2018) Destination website quality, users' attitudes and the willingness to participate in online co-creation experiences. Eur J Manag Bus Econ 27(1):26–41. https://doi.org/10.1108/EJMBE-11-2017-0048

Keefer P, Knack S (2008) Social capital, social norms and the new institutional economics. Handb New InstAl Econ 1990:701–725. https://doi.org/10.1007/978-3-540-69305-5_28

Khaw KW, Alnoor A, Al-Abrrow H, Chew XY, Sadaa AM, Abbas S, Khattak ZZ (2022) Modelling and evaluating trust in mobile commerce: a hybrid three stage fuzzy delphi, structural equation modeling, and neural network approach. Int J Hum-Comput Interact 00(00):1–17. https://doi.org/10.1080/10447318.2021.2004700

Khwaja MG, Zaman U (2020) Configuring the evolving role of ewom on the consumers information adoption. J Open Innov: Technol, Mark, Complex 6(4):1–13. https://doi.org/10.3390/joitmc6040125

Kim J, Lennon SJ (2013) Effects of reputation and website quality on online consumers' emotion, perceived risk and purchase intention: based on the stimulus-organism-response model. J Res Interact Mark 7(1):33–56. https://doi.org/10.1108/17505931311316734

Kim S, Park H (2013) Effects of various characteristics of social commerce (s-commerce) on consumers' trust and trust performance. Int J Inf Manage 33(2):318–332. https://doi.org/10.1016/j.ijinfomgt.2012.11.006

Kleinlercher K, Emrich O, Herhausen D, Verhoef PC, Rudolph T (2018) Websites as information hubs: how informational channel integration and shopping benefit density interact in steering customers to the physical store. J Assoc Consum Res 3(3):330–342. https://doi.org/10.1086/698415

Kohl P, Wardropper C (2022) Knowledge of majority scientific agreement on anthropogenic climate change predicts perceived global risk better than perceived personal risk. J Risk Res 25(6):778–790. https://doi.org/10.1080/13669877.2022.2028883

Lal P (2017) Analyzing determinants influencing an individual's intention to use social commerce website. Futur Bus J 3(1):70–85. https://doi.org/10.1016/j.fbj.2017.02.001

Lamie RD, Barkley DL, Markley DM (2011) Positive examples and lessons learned from rural small business adoption of e-commerce strategies. J Ext 49(6):1–8

Laroche M, Yang Z, McDougall GHG, Bergeron J (2005) Internet versus bricks-and-mortar retailers: an investigation into intangibility and its consequences. J Retail 81(2):251–267. https://doi.org/10.1016/j.jretai.2004.11.002

Lawrence JE, Tar UA (2010) Barriers to ecommerce in developing countries. Inf, Soc Justice 3(1):23–35. https://doi.org/10.4018/jgim.2011070102

Lăzăroiu G, Negurĭţă O, Grecu I, Grecu G, Mitran PC (2020) Consumers' decision-making process on social commerce platforms: online trust, perceived risk, and purchase intentions. Front Psychol 11(May):1–7. https://doi.org/10.3389/fpsyg.2020.00890

Leong LY, Hew TS, Ooi KB, Chong AYL (2020) Predicting the antecedents of trust in social commerce – a hybrid structural equation modeling with neural network approach. J Bus Res 110(December 2018):24–40. https://doi.org/10.1016/j.jbusres.2019.11.056

Liang CJ, Chen HJ (2009) A study of the impacts of website quality on customer relationship performance. Total Qual Manag Bus Excell 20(9):971–988. https://doi.org/10.1080/147833609 03181784

Liang TP, Ho YT, Li YW, Turban E (2011) What drives social commerce: the role of social support and relationship quality. Int J Electron Commer 16(2):69–90. https://doi.org/10.2753/JEC1086-4415160204

Lin H, Fan W, Chau PYK (2014) Determinants of users' continuance of social networking sites: a self-regulation perspective. Inf Manag 51(5):595–603. https://doi.org/10.1016/j.im.2014.03.010

Lin X, Li Y, Wang X (2017) Social commerce research: definition, research themes and the trends. Int J Inf Manage 37(3):190–201. https://doi.org/10.1016/j.ijinfomgt.2016.06.006

Lin X, Wang X, Hajli N (2019) Building e-commerce satisfaction and boosting sales: the role of social commerce trust and its antecedents. Int J Electron Commer 23(3):328–363. https://doi.org/10.1080/10864415.2019.1619907

Liu CL, Yeh YH (2018) Ownership concentration and bank risk: international study on acquisitions. Eur J Financ 24(9):761–808. https://doi.org/10.1080/1351847X.2017.1354901

Liu, Jianfeng, Zhou L, Wang Y (2021) Altruistic preference models of low-carbon E-commerce supply chain. Math 9(14). https://doi.org/10.3390/math9141682

Liu J, Zhang HJ, Sun JJ, Li NX, Bilgihan A (2020) How to prevent negative online customer reviews: the moderating roles of monetary compensation and psychological compensation. Int J Contemp Hosp Manag 32(10):3115–3134. https://doi.org/10.1108/IJCHM-04-2020-0334

Liu Q, Shao Z, Fan W (2018) The impact of users' sense of belonging on social media habit formation: empirical evidence from social networking and microblogging websites in China. Int J Inf Manage 43(13):209–223. https://doi.org/10.1016/j.ijinfomgt.2018.08.005

Lo P-S, Dwivedi YK, Wei-Han Tan G, Ooi K-B, Cheng-Xi Aw E, Metri B (2022) Why do consumers buy impulsively during live streaming? a deep learning-based dual-stage SEM-ANN analysis. J Bus Res 147(April):325–337. https://doi.org/10.1016/j.jbusres.2022.04.013

Lopez-Nicolas C, Molina-Castillo FJ (2008) Customer knowledge management and e-commerce: The role of customer perceived risk. Int J Inf Manage 28(2):102–113. https://doi.org/10.1016/j.ijinfomgt.2007.09.001

Lu B, Fan W, Zhou M (2016) Social presence, trust, and social commerce purchase intention: an empirical research. Comput Hum Behav 56:225–237. https://doi.org/10.1016/j.chb.2015.11.057

Maia C, Lunardi G, Longaray A, Munhoz P (2018) Factors and characteristics that influence consumers' participation in social commerce. Revista De Gestao 25(2):194–211. https://doi.org/10.1108/REGE-03-2018-031

Mak B, Schmitt BH, Lyytinen K (1997) User participation in knowledge update of expert systems. Inf Manag 32(2):55–63. https://doi.org/10.1016/S0378-7206(96)00010-9

Malecki EJ (2003) Digital development in rural areas: potentials and pitfalls. J Rural Stud 19:201–214

Mangold WG, Faulds DJ (2009) Social media: the new hybrid element of the promotion mix. Bus Horiz 52(4):357–365. https://doi.org/10.1016/j.bushor.2009.03.002

Milan GS, Bebber S, Toni D De, Eberle L (2015, January) Information Quality, Distrust and Perceived Risk as Antecedents of Purchase Intention in the Online Purchase Context. J Manag Inf Syst & E-Commer. https://doi.org/10.15640/jmise.v2n2a2

Miranda S, Duarte M (2022) How perfectionism reduces positive word-of-mouth: the mediating role of perceived social risk. Psychol Mark 39(2):255–270. https://doi.org/10.1002/mar.21593

Mirkovski K, Yin C, Liu L, Yang J (2019) Exploring the Contingent Effect of Community Equity on Users' Intention to Share Information. Inf Syst Front 21(4):845–860. https://doi.org/10.1007/s10796-017-9777-8

Molinillo S, Anaya-Sánchez R, Liébana-Cabanillas F (2020) Analyzing the effect of social support and community factors on customer engagement and its impact on loyalty behaviors toward social commerce websites. Comput Hum Behav 108(April 2019):105980. https://doi.org/10.1016/j.chb.2019.04.004

Muhammad SS, Dey BL, Kamal MM, Syed Alwi SF (2021) Consumer engagement with social media platforms: a study of the influence of attitudinal components on cutting edge technology adaptation behaviour. Comput Hum Behav 121(March):106802. https://doi.org/10.1016/j.chb.2021.106802

Ng FZX, Yap HY, Tan GWH, Lo PS, Ooi KB (2022) Fashion shopping on the go: a Dual-stage predictive-analytics SEM-ANN analysis on usage behaviour, experience response and cross-category usage. J Retail Consum Serv 65(1):102851. https://doi.org/10.1016/j.jretconser.2021.102851

Nilashi M, Ali Abumalloh R, Alrizq M, Alghamdi A, Samad S, Almulihi A, Althobaiti MM, Yousoof Ismail M, Mohd S (2022) What is the impact of eWOM in social network sites on travel decision-making during the COVID-19 outbreak? a two-stage methodology. Telemat Inform 69(February):101795. https://doi.org/10.1016/j.tele.2022.101795

Ochepo CO (2019) Rural communities access to community and social development projects in North Central Nigeria. J Agric Ext Rural Dev 11(9):149–155. https://doi.org/10.5897/jaerd2019.1045

Ohanian R (1990) Construction and validation of a scale to measure celebrity endorsers' perceived expertise, trustworthiness, and attractiveness. J Advert 19(3):39–52. https://doi.org/10.1080/00913367.1990.10673191

Park DH, Lee J, Han I (2007) The effect of on-line consumer reviews on consumer purchasing intention: the moderating role of involvement. Int J Electron Commer 11(4):125–148. https://doi.org/10.2753/JEC1086-4415110405

Pavlou PA (2003) Consumer acceptance of electronic commerce: integrating trust and risk with the technolojy acceptance model. Int J Electron Commer 7(3):101–134. https://doi.org/10.1080/10864415.2003.1104475

Pelaez A, Chen CW, Chen YX (2019) Effects of perceived risk on intention to purchase: a meta-analysis. J Comput Inf Syst 59(1):73–84. https://doi.org/10.1080/08874417.2017.1300514

Peter JP, Ryan MJ (1976) Investigation of brand risk the level. J Mark 13(2):184–188

Phang CW, Kankanhalli A, Sabherwal R (2009) Usability and sociability in online communities: a comparative study of knowledge seeking and contribution. J Assoc Inf Syst 10(10):721–747. https://doi.org/10.17705/1jais.00210

Powers TL, Hopkins RA (2006) Altruism and consumer purchase behavior. J Int Consum Mark 19(1):107–130. https://doi.org/10.1300/J046v19n01_06

Regner T, Riener G (2017) Privacy is precious: on the attempt to lift anonymity on the internet to increase revenue. J Econ Manag Strat 26(2):318–336. https://doi.org/10.1111/jems.12192

Reichelt J, Sievert J, Jacob F (2014) How credibility affects eWOM reading: the influences of expertise, trustworthiness, and similarity on utilitarian and social functions. J Mark Commun 20(1–2):65–81. Taylor & Francis. https://doi.org/10.1080/13527266.2013.797758

Rosen D, Lafontaine PR, Hendrickson B (2011) Couchsurfing: belonging and trust in a globally cooperative online social network. New Media Soc 13(6):981–998. https://doi.org/10.1177/1461444810390341

Rosillo-Díaz E, Blanco-Encomienda FJ, Crespo-Almendros E (2020) A cross-cultural analysis of perceived product quality, perceived risk and purchase intention in e-commerce platforms. J Enterp Inf Manag 33(1):139–160. https://doi.org/10.1108/JEIM-06-2019-0150

Rouibah K, Al-Qirim N, Hwang Y, Pouri SG (2021) The determinants of ewom in social commerce: the role of perceived value, perceived enjoyment, trust, risks, and satisfaction. J Glob Inf Manag 29(3):75–102. https://doi.org/10.4018/JGIM.2021050104

Rouibah K, Lowry PB, Hwang Y (2016) The effects of perceived enjoyment and perceived risks on trust formation and intentions to use online payment systems: new perspectives from an Arab country. Electron Commer Res Appl 19:33–43. https://doi.org/10.1016/j.elerap.2016.07.001

Sadaa AM, Ganesan Y, Ahmed MG (2020) The effect of earnings quality and bank continuity: the moderating role of ownership structure and CSR. J Sustain Financ Invest 1–21. https://doi.org/10.1080/20430795.2020.1858690

Sadaa AM, Ganesan Y, Yet CE (2022a) THE INFLUENCE OF BOARD OF DIRECTORS STRUCTURE ON IRAQI BANKS CREDIT RISK: CONCEPTUAL PAPER. Int. J. Account. Finance & Bus 7(39): 167–182. https://doi.org/10.55573/IJAFB.073916

Sadaa AM, Ganesan Y, Yet CE (2022b) The Effect of Ownership Structure on the Nonperforming Loans in Iraqi Banks. J. Fin. Bank. Review 7(1): 86–97. https://doi.org/10.35609/jfbr.2022.7.1(6)

Saiphoo AN, Dahoah Halevi L, Vahedi Z (2020) Social networking site use and self-esteem: a meta-analytic review. Pers Individ Differ 153(September 2019):109639. https://doi.org/10.1016/j.paid.2019.109639

Salamon S (2003) From hometown to nontown: rural community effects of suburbanization. Rural Sociol 68(1):1–24. https://doi.org/10.1111/j.1549-0831.2003.tb00126.x

Savas S (2017) Perceived risk and consumer adoption of service innovations. Florida Atlantic University.

Schaefer C, Coyne JC, Lazarus RS (1981) The health-related functions of social support. J Behav Med 4(4):381–406. https://doi.org/10.1007/BF00846149

Shanmugam M, Sun S, Amidi A, Khani F, Khani F (2016) The applications of social commerce constructs. Int J Inf Manage 36(3):425–432. https://doi.org/10.1016/j.ijinfomgt.2016.01.007

Sharma GD, Thomas A, Paul J (2021) Reviving tourism industry post-COVID-19: a resilience-based framework. Tour Manag Perspect 37(October 2020):100786. https://doi.org/10.1016/j.tmp.2020.100786

Sharma J, Kurien D (2017) Perceived risk in e-commerce: a demographic perspective. Nmims Management Review 34(1):31–57

Sharma S, Singh G, Pratt S (2022) Modeling the multi-dimensional facets of perceived risk in purchasing travel online: a generational analysis. J Qual Assur Hosp Tour 23(2):539–567. https://doi.org/10.1080/1528008X.2021.1891597

Sharma S, Crossler RE (2014) Disclosing too much? situational factors affecting information disclosure in social commerce environment. Electron Commer Res Appl 13:305–319

Sheikh Z, Yezheng L, Islam T, Hameed Z, Khan IU (2019) Impact of social commerce constructs and social support on social commerce intentions. Inf Technol People 32(1):68–93. https://doi.org/10.1108/ITP-04-2018-0195

Sicat M (2016) E-commerce for rural development: global trends. ICT Analysis Section, UNCTAD Division on Technology and Logistics.

Sohaib M, Hui P, Akram U (2018) Impact of eWOM and risk-taking in gender on purchase intentions: evidence from Chinese social media. Int J Inf Syst Change Manage 10(2):101–122. https://doi.org/10.1504/IJISCM.2018.094602

Stouthuysen K, Teunis I, Reusen E, Slabbinck H (2018) Initial trust and intentions to buy: the effect of vendor-specific guarantees, customer reviews and the role of online shopping experience. Electron Commer Res Appl 27:23–38. https://doi.org/10.1016/j.elerap.2017.11.002

Sundaram DS, Mitra K, Webster C (1998) Word-of-mouth communications: a motivational analysis. ACR North American Advances. Adv Consum Res 25.

Tajvidi M, Richard MO, Wang YC, Hajli N (2020) Brand co-creation through social commerce information sharing: the role of social media. J Bus Res 121(January 2018):476–486. https://doi.org/10.1016/j.jbusres.2018.06.008

Tariq B, Najam H, Han H, Sadaa Abdullah M, Abbasi AA, Christopher N, Abbasi GA (2021) Examining mobile financial services in Pakistan: rural and urban perspective with gender as a moderator. Recent advances in technology acceptance models and theories (pp. 225–245). Springer

Telle NT, Senior C, Butler M (2011) Trait emotional intelligence facilitates responses to a social gambling task. Personality Individ Differ 50(4):523–526. https://doi.org/10.1016/j.paid.2010.11.010

Tian Y, Zhang H, Jiang Y, Yang Y (2022) Understanding trust and perceived risk in sharing accommodation: an extended elaboration likelihood model and moderated by risk attitude. J Hosp Market Manag 31(3):348–368. https://doi.org/10.1080/19368623.2022.1986190

Tong Y, Wang X, Tan CH, Teo HH (2013) An empirical study of information contribution to online feedback systems: a motivation perspective. Information and Management 50(7):562–570. https://doi.org/10.1016/j.im.2013.02.009

Trusov M, Bucklin RE, Pauwels K (2009) Effects of word-of-mouth versus traditional marketing: findings from an internet social networking site. J Mark 73(5):90–102. https://doi.org/10.1509/jmkg.73.5.90

Tzavlopoulos I, Gotzamani K, Andronikidis A, Vassiliadis C (2019) Determining the impact of e-commerce quality on customers' perceived risk, satisfaction, value and loyalty. Int J Qual Serv Sci 11(4):576–587. https://doi.org/10.1108/IJQSS-03-2019-0047

Um NH (2019) Antecedents and consequences of consumers' attitude toward social commerce sites. J Promot Manag 25(4):500–519. https://doi.org/10.1080/10496491.2018.1448324

Vos A, Marinagi C, Trivellas P, Eberhagen N, Skourlas C, Giannakopoulos G (2014) Risk reduction strategies in online shopping: e-trust Perspective. Procedia Soc Behav Sci 147:418–423. https://doi.org/10.1016/j.sbspro.2014.07.122

Waemustafa W, Sukri S (2015) Bank specific and macroeconomics dynamic determinants of credit risk in islamic banks and conventional banks. Int J Econ Financ Issues 5(2):476–481. https://doi.org/10.6084/m9.figshare.4042992

Wang G, Tan GWH, Yuan Y, Ooi KB, Dwivedi YK (2022) Revisiting TAM2 in behavioral targeting advertising: a deep learning-based dual-stage SEM-ANN analysis. Technol Forecast Soc Chang 175(November 2021):121345. https://doi.org/10.1016/j.techfore.2021.121345

Wang JC, Chang CH (2013) How online social ties and product-related risks influence purchase intentions: a Facebook experiment. Electron Commer Res Appl 12(5):337–346. https://doi.org/10.1016/j.elerap.2013.03.003

Wang X, Tajvidi M, Lin X, Hajli N (2020a) Towards an ethical and trustworthy social commerce community for brand value co-creation: a trust-commitment perspective. J Bus Ethics 167(1):137–152. https://doi.org/10.1007/s10551-019-04182-z

Wang Y, Wang J, Yao T, Li M, Wang X (2020b) How does social support promote consumers' engagement in the social commerce community? the mediating effect of consumer involvement. Inf Process Manage 57(5):102272. https://doi.org/10.1016/j.ipm.2020.102272

Wasko MML, Faraj S (2005) Why should I share? examining social capital and knowledge contribution in electronic networks of practice. MIS Q: Manag Inf Syst 29(1):35–57. https://doi.org/10.2307/25148667

Williams MD (2021) Social commerce and the mobile platform: payment and security perceptions of potential users. Comput Hum Behav 115. https://doi.org/10.1016/j.chb.2018.06.005

Wojnicki AC, Godes D (2011) Word-of-mouth as self-enhancement. SSRN Electron J 1–48. https://doi.org/10.2139/ssrn.908999

Wu PCs, Wang YC (2011) The influences of electronic word-of-mouth message appeal and message source credibility on brand attitude. Asia Pac J Mark Logist 23(4):448–472.https://doi.org/10.1108/13555851111165020

Xu D, Zhou W, Deng X, Ma Z, Yong Z, Qin C (2020) Information credibility, disaster risk perception and evacuation willingness of rural households in China. Nat Hazards 103(3):2865–2882. https://doi.org/10.1007/s11069-020-04106-5

Xu Y (Calvin), Zhang C, Xue L (2013) Withdrawn: measuring product susceptibility in online product review social network. Decis Support Syst 200433.https://doi.org/10.1016/j.dss.2013.01.009

Yadav MS, de Valck K, Hennig-Thurau T, Hoffman DL, Spann M (2013) Social commerce: a contingency framework for assessing marketing potential. J Interact Mark 27(4):311–323. https://doi.org/10.1016/j.intmar.2013.09.001

Yahia I Ben, Al-Neama N, Kerbache L (2018) Investigating the drivers for social commerce in social media platforms: importance of trust, social support and the platform perceived usage. J Retail Consum Serv 41(October 2017):11–19. https://doi.org/10.1016/j.jretconser.2017.10.021

Yan Q, Wu S, Zhou Y, Zhang L (2018) How differences in eWOM platforms impact consumers' perceptions and decision-making. J Organ Comput Electron Commer 28(4):315–333. https://doi.org/10.1080/10919392.2018.1517479

Yang Q, Pang C, Liu L, Yen DC, Michael Tarn J (2015) Exploring consumer perceived risk and trust for online payments: an empirical study in China's younger generation. Comput Hum Behav 50:9–24. https://doi.org/10.1016/j.chb.2015.03.058

Yang X (2021) Exchanging social support in social commerce: the role of peer relations. Comput Hum Behav 124(June):106911. https://doi.org/10.1016/j.chb.2021.106911

Yang Z, Van Ngo Q, Chen Y, Nguyen CXT, Hoang HT (2019) Does ethics perception foster consumer repurchase intention? role of trust, perceived uncertainty, and shopping habit. SAGE Open 9(2). https://doi.org/10.1177/2158244019848844

Yousafzai SY, Pallister JG, Foxall GR (2003) A proposed model of e-trust for electronic banking. Technovation 23(11):847–860. https://doi.org/10.1016/S0166-4972(03)00130-5

Yusuf AS, Che Hussin AR, Busalim AH (2018) Influence of e-WOM engagement on consumer purchase intention in social commerce. J Serv Mark 32(4):493–504. https://doi.org/10.1108/JSM-01-2017-0031

Zha X, Yang H, Yan Y, Liu K, Huang C (2018) Exploring the effect of social media information quality, source credibility and reputation on informational fit-to-task: moderating role of focused immersion. Comput Hum Behav 79:227–237. https://doi.org/10.1016/j.chb.2017.10.038

Zhang Z, Hou Y (2017) The effect of perceived risk on information search for innovative products and services: The moderating role of innate consumer innovativeness. J Consum Mark 34(3):241–254.

Zheng C, Yu X, Jin Q (2017) How user relationships affect user perceived value propositions of enterprises on social commerce platforms. Inf Syst Front 19(6):1261–1271. https://doi.org/10.1007/s10796-017-9766-y

Zheng Y, Zhao K, Stylianou A (2013) The impacts of information quality and system quality on users' continuance intention in information-exchange virtual communities: an empirical investigation. Decis Support Syst 56(1):513–524. https://doi.org/10.1016/j.dss.2012.11.008

Zhou L, Zhang P, Zimmermann HD (2013) Social commerce research: an integrated view. Electron Commer Res Appl 12(2):61–68. https://doi.org/10.1016/j.elerap.2013.02.003

Abdullah Mohammed Sadaa is a PhD student at the Graduate School of Business, Universiti Sains Malaysia, Penang, Malaysia. He has published research in various journals. He serves as a reviewer for many journals.

Yuvaraj Ganesan is a senior lecturer at Graduate School of Business, Universiti Sains Malaysia. He obtained the PhD from USM. He had published articles in journal and had attended and presents paper in the International Conference. His research interests are Auditing, Service Quality, Non-audit Services, Corporate Governance, Corporate Social Responsibility, Small and Medium Enterprises, and Small and Medium Practitioners. He has working experience in auditing and commercial sector. He started his career path as an Audit Assistant in an audit firm. He then moved to commercial sector as a Group Accountant to earn corporate experience. Besides industrial experience, he also has research experiences working as Research Officer. He is also a member of the editorial board for journals. He is a member of Malaysian Institute of Accountants (MIA) and Institute of Internal Audit, Malaysia (IIAM).

Sammar Abbas is an Associate professor of organization studies at the Kohat University of Science and Technology in Kohat, Pakistan. He received his doctoral degree in business administration at the University of Essex in the United Kingdom. His research interests center on organizational studies.

Tha'er Majali Associate professor of Management Information Systems /E-Business at Applied Science Private University, Jordan. He published many papers at high-impact journals. Also, he is a reviewer at several journals.

Alyaa Abdulhussein Kareem is a PhD student at the School of Industrial Technology, Universiti Sains Malaysia, Penang, Malaysia. She has published research in various journals. She serves as a reviewer for many journals.

Electronic Word of Mouth and Social Commerce

Ali Shakir Zaidan, XinYing Chew, Khai Wah Khaw, and Marcos Ferasso

1 Introduction

Numerous social media platforms have emerged because of the need for social interaction and the expansion of Web 2.0 technologies. Technological development has led to the development of e-commerce and s-commerce. Social commerce encourages internet-based customer interactions for product promotion (Hajli 2015). In this context, consumers are becoming increasingly engaged and frequently generate as well as absorb content. Individuals who want to purchase goods and services in the near future can now access the vast information that their peers make about goods and services through IT before making a buying decisions. Researchers have revealed that consumers are more affected by eWOM on social commerce platforms; hence, eWOM could eliminate product ambiguity and improve consumers' trust, consequently improving purchase intentions (Hajli et al. 2014). Since the start of the World Wide Web in the early 1990s, a large number of large and small companies have been involved in e-commerce (Jalilvand et al. 2011). Consumers increasingly use Web 2.0 technologies to voice their thoughts and share product information (Gupta and Harris 2010). In Web 2.0 development and social communication services, such as Facebook, virtual reality, and online communities, virtual reality and online communities

A. S. Zaidan · K. W. Khaw (✉)
School of Management, Universiti Sains Malaysia, 11800 Pulau Pinang, Malaysia
e-mail: khaiwah@usm.my

A. S. Zaidan
e-mail: sha3883@student.usm.my

M. Ferasso
Economics and Business Sciences Department, Universidade Autónoma de Lisboa,
1169-023 Lisboa, Portugal

X. Chew
School of Computer Sciences, Universiti Sains Malaysia, 11800 Pulau Pinang, Malaysia
e-mail: xinying@usm.my

are prevalent (such as Wikipedia, YouTube, and Flickr), collaboration and community are crucial qualities (Jansen et al. 2009). This transformation of eWOM may include positive or harmful comments made by prospective, current, and previous clients about a product or business over the internet (Hennig-Thurau et al. 2004). Moreover, the emergence of new media channels has created a fertile field for eWOM.

Additionally, online customer reviews were found to strongly affect consumer purchase decisions. Undoubtedly, online word of mouth has been a tremendous marketing and purchase force. In recent years, the literature on the efficiency of eWOMC has exploded (ChannelAdvisor 2010; Davis and Khazanchi 2008). eWOM is considered a vital factor to achieve social commerce (Meilatinova 2021). S-commerce, often known as a social business, lacks a precise academic definition because it conveys multiple connotations in academic discourse (Goraya et al. 2021). However, current study has demonstrated that social commerce enables people to engage in purchasing, selling, and comparing through the usage of Net-based media, and sharing of product and service information in electronic markets (Busalim and Hussin 2016). Members' activity in the social commerce community could be affected by other participants; when promoting social wOM, consumers may follow the opinions of others (Cheng et al., 2021). According to the findings of this study on social commerce, consumers can create proper social interactions on social media platforms that help customers gather important product knowledge, as well as reassure them that they are making a smart purchase decision. Additionally, this unit describes trust in advertising. The importance of trust in online advertising derives from the fact that if people mistrust online advertisements, their efficiency would be considerably decreased. Currently, people have a low level of trust in online advertising.

2 Concept of Electronic Word of Mouth

Word of mouth (eWOM) has the potential to significantly change consumers' preferences, which in turn can have an effect on their purchasing decisions (Cheung et al. 2008). Word-of-mouth marketing is a practice in which individuals convey ideas and thoughts regarding goods, reputation, or service in an attempt to influence purchasers to consume that product, brand, or service (Jeong and Jang 2011). eWOM is the procedure of communicating data from one individual to another, and it acts a significant influence on the purchasing decisions of customers (Richins and Root-Shaffer 1988). The method, known as eWOM, enables customers to share information and opinions that lead customers toward essential goods and services. Consumers try to replicate each other according to the concept of explicit social learning, moreover, and perhaps most importantly, consumers communicate with each other (Jalilvand et al. 2011). Additionally, online customer reviews were found to strongly affect consumer purchase decisions. Indeed, eWOM has been a tremendous advertising and purchase force. In recent years, the literature on the efficiency of eWOM has exploded (ChannelAdvisor 2010; Davis and Khazanchi 2008).

Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Islam et al. (2020), sharing goods and services by social media is considered a critical issue in the e commerce. Therefore, the impact of personal attributes and motivational factors on influence social media fatigue was investigated (Hennig-Thurau et al. 2004). Positive eWOM is regarded as an effective marketing tool for companies seeking to influence consumers. People rely on their relatives, friends, and others within their social network for eWOM (Jansen et al. 2009). In commercial contexts, eWOM entails consumers communicating their attitudes, opinions, or responses regarding businesses, products, or services to others. eWOM is persuasive, diverse, and often difficult to influence (Ha 2006). According to Duan et al. (2008a), people also appear to have faith in comments from people beyond their direct social association, such as internet reviews. While eWOM shares some characteristics with conventional eWOM, it differs from conventional eWOM in a number of areas. In addition, past study has demonstrated that word of mouth is more useful than conventional advertisement campaigns like personal selling and formal advertising mediums. Therefore, it has long been a crucial subject for marketing academics and practitioners (Cheung et al. 2008). These characteristics contribute to electronic word-of-mouth communication's uniqueness.

Initially, unlike conventional word of mouth, word-of-mouth communications have unparalleled scalability and dissemination speed. Like conventional word-of-mouth, information is shared in a synchronous manner between small groups of persons (Steffes and Burgee 2009). Following the launch of the Internet, e-word-of-mouth transmission was extended to different additional virtual contexts, hence expanding the influence of word-of-mouth communication on buying choices. A wide variety of online venues allow customers to voice their opinions about products, including weblogs, discussion forums, online magazines, and e-bulletin board systems, in addition to social networking websites like Facebook.com (Cheung and Lee 2012). In traditional word of mouth, information is typically shared in private talks or dialogs. Therefore, it is quite challenging to relay the knowledge to anyone who is not there when and where the information is exchanged. In contrast, digital word-of-mouth communications entail asynchronous multidirectional information transfers (Hung and Li 2007). When all communicators are present, it is unnecessary to exchange information in the form of e-word-of-mouth simultaneously. For example, forum users can read and publish comments after threads have been formed, and not necessarily at the time the threads are being created. Additionally, eWOM is more forceful and available than conventional word of mouth. Most of the textual content offered on the Internet is archived and hence would be accessible indefinitely (Karakaya and Barnes 2010; Park et al. 2007). eWOM is more accurate than conventional WOM in terms of tracking and reporting (Park and Kim 2008). eWOM is a new kind of electronic word-of-mouth marketing that builds on the foundations of traditional word-of-mouth marketing. A large number of marketing and consumer researches have focused on word of mouth, specifically how eWOM influences consumption (Senecal and Nantel 2004). Stauss (1997, 2000) investigated the challenges and opportunities presented to businesses through the proliferation of online consumer expressions called eWOM. eWOM is often face to face while

e word of mouth occurs online. As a result of technological improvements, face-to-face interaction has given way to electronic discussion. Because of this change in media, the traditional versus electronic word of mouth distinction is now more apparent than ever.

eWOM's accessibility suggests that it could reach masses of citizens, will be available for a long time, and can be found by nearly anyone interested in the products or businesses. On the other hand, conventional eWOM interaction becomes more trustworthy when eWOM information is uploaded anonymously online. With the rise and widespread use of s-commerce groups, social word of mouth (SWOM), or eWOM on social media, is replacing classical eWOM as the predominant means of consumer socialization (Herrando et al. 2017). The success of eWOM as a means of distributing an opinion stems from the fact that it is typically communicated face to face among individuals who are common having some credibility as acquaintances or buddies (Jeong and Jang 2011). As a result of its crucial role in molding customer behavior and long-term purchasing decisions, eWOM is essential part of any social media strategy for a business. Consequently, positive eWOM is a crucial strategy for businesses to obtain a competitive advantage and develop lasting relationships with their customers. When promoting new items, companies must pay greater attention to eWOM (Chen 2011).

3   Concept of Social Commerce

Social commerce (s-commerce) is a manner of business managed via social media and characterized by the confluence of the online and offline worlds (Wang and Zhang 2012). The term s-commerce was developed in 2005 to describe the expanding commercial use of social networking sites and other forms of social media (Curty and Zhang 2011). S-commerce is a phenomenon that has its roots in social media practise and Web 2.0 technologies, which have developed popular customer means for socializing and sharing commercially relevant information (Lin et al. 2017). S-commerce is a type of social interaction that could facilitate social communication and client-created content to assist customers in making purchasing resolutions and acquiring knowledge regarding commodities and services (Zheng et al., 2020). S-commerce refers to the use of web-based social networks by e-commerce businesses, with a focus on how social influence modifies consumer interactions (Kim and Srivastava 2007). According to Liang and Turban (2011) argue that s-commerce is the application of the eWOM idea to e-commerce and is the combination of a company's goods and the engagement of its customers with content. Marsden (2011) identified a number of s-commerce components that encompass a variety of s-commerce characteristics (e.g., eWOM, trusted information, or buying with the assistance of colleagues). Researchers found that social support from online friends is essential for the adoption of e-commerce by consumers (Liang et al. 2011).

S-commerce has unique characteristics compared to conventional e-commerce. In terms of client engagement, s-commerce is based on social media, which aims to

establish relations between members of the social commerce community (Zhang et al. 2014). S-commerce can be characterized as the application of eWOM to the e-commerce (Dennison et al. 2009). However, according to Parise and Guinan (2008), s-commerce indicates to a more social, innovative, and cooperative method utilized in online markets. Web 2.0 technologies match an emerging trend when users generate and share valuable content. S-commerce encompasses marketing, computer science, sociology, and psychology, resulting in a wide range of meanings (Huang and Benyoucef, 2013). For example, in marketing, s-commerce refers to a trend in online marketplaces in which corporations use social media or Web 2.0 as a contemporary advertising strategy to improve clients' decision-making processes and purchasing patterns (Constantinides and Fountain 2008). The increasing adoption of social networking sites such as LinkedIn, Facebook, and Twitter has provided the way for the development of new s-commerce and e-commerce business concepts. (Liang and Turban 2011). S-commerce is the use of Web 2.0 social media technologies to enable online connections and customer participation to ease the purchase of goods and services (Liang and Turban 2011). In addition to providing a new forum for creativity, the social media ecosystem raises several new and challenging research questions that need the creation of new theories. Co-creation, for instance, has become a popular trend, and eWOM in internet commerce has grown more important (Cheung et al. 2009). Social media is a division of Web 2.0, and the IT innovation in Web usage is changing s-commerce into a distinct expansion of e-commerce, which agrees to be a very interesting study topic over the next decade (Zwass 2010). In today's competitive business environment, corporations have actively embraced social media platforms to display their business online and achieve marketing goals (Hajli 2015). Researchers suggest that creating a compelling consumer experience that incorporates social activities at every level of the decision-making procedure is a must for successful social commerce (Cheung and Phillimore 2014).

4 The Difference between Electronic Commerce and Social Commerce

In this section, describe the difference between e-commerce and s-commerce. E-commerce and s-commerce have same concept which define as a way to complete transaction between firms and customers via IT. Hence, many previous studies discussed such concepts by conducting deep investigation. According to Islam et al. (2020) purchase goods and services via social media is considered a critical issue in markets. Therefore, the impact of social network and IT factors on influence social media were investigated. In conditions of corporate goals, customer connections, design of the web and system engagement, the contrasts between e-commerce and s-commerce can be underlined. In terms of business objectives, e-commerce techniques that improve efficiency include intelligent searches, purchases, transactions led by requirements, and suggestions based on online shopping performance (Nikbin

et al. 2012). Usually, consumers cooperate with e-commerce programs individually of other customers. Individual customers connect with e-commerce platforms (Huang and Benyoucef 2013). Traditional e-commerce is a one-way street when it comes to system engagement, with users' data rarely being exchanged with businesses or other consumers. System interaction provides one-way navigation (Shen 2012; Carroll 2008). S-commerce is largely aimed at social functions, such as networking, collaboration, and knowledge sharing, with a secondary emphasis on purchase (Wang and Zhang 2012). Customers join online communities that foster social interaction and conversation among members (Shen 2012). While s-commerce incorporates online groups that facilitate social interaction to improve customer communication (Kim and Srivastava 2007). Furthermore, social commerce attracts clients with more social and interactive opportunities to communicate and share information with businesses and other customers (Parise and Guinan 2008).

This section describes group adopts perceptions, product characteristics and customer preferences. Hence, many previous studies discussed such a concept by conducting hybrid or dual approach SEM and ANN. According to Islam et al. (2020), share news and information via IT is considered a critical issue. Therefore, the impact of costumer attributes and motivational factors on influence IT was investigated based on SEM and ANN analysis. However, the first group adopts perceptions. The consumers face many factors that make their preferences fluctuating. To establish a relationship between product characteristics and customer preferences, it is necessary to understand the user's perceptions of the product. SEM is one of the most common methods that explain this, and for understanding consumer preferences, the ANN is complementary. So, to accurately understand the consumer preference factors (Leong et al. 2020), SEM and ANN has been used to determine the factors that affect customer expectations and perceptions. Because of the significant change that the digital age is experiencing, users are frequently changing their phones. So, customer retention is difficult for such companies. It is necessary to understand customer expectations and perceptions of the brand direction. To shed light on the decision-making process by the customers (Ooi and Tan 2016), for example, Chang et al. (2016) discusses the problems of intent to shop by identifying a set of factors represented by perceived mobility, social presence, quality of the system, and service. SEM-ANN was used to determine the degrees of importance of these factors and identify tourists' perceptions. Likewise, there are problems related to the hypothetical brand's customer perceptions, especially the lack of interaction, quality of information, and comfort. SEM-ANN is a vital tool for exploring the motivating factors for customers that increase the hypothetical brand's perceived value (Liébana et al. 2021).

A source of great concern for many kinds of literature is especially confidence in e-commerce, as many factors affect the intention to buy. There are many determinants of the formation of confidence in electronic commerce. To identify these factors and address these problems, SEM-ANN was applied to discover the determinants of trust in e-commerce and support electronic shopping centers (Sharma and Sharma 2019). According to Rehman et al. (2021), trust has a vital role in influencing online advertisements' effectiveness. Therefore, customer confidence in online ads remains

low. To address this problem, the SEM-ANN approach is appropriate to identify the categories that mostly affect the customer's confidence in online advertising. For building consumer confidence and simplifying their buying decision-making process, UTAUT model has been widely used from previous studies, where there are many obstacles to adopting smart meters based on the Internet to achieve energy supply efficiency (Loh et al. 2022). According to Zheng et al. (2020), understanding the determinants of mobile health application approval is still unclear. Therefore, it is necessary to measure the factors that affect the acceptance of these applications by using SEM-ANN. The intention to use and accept government applications for government services suffers from many problems due to a lack of trust and information quality. Therefore, Liébana et al. (2017) discussed the possibility of using the UTAUT model to reach actual solutions that guarantee acceptance of technology and to determine the relative importance of these determinants and establish the factors that affect consumers' acceptance of this technology. With the tremendous development in communication technologies, many organizations have adopted mobile payment. Still, they are facing acceptance problems, Xuan et al. (2022) used UTAUT2 as a technology acceptance model. By integrating SEM-ANN, the most critical factors determining the acceptance of mobile payment technology have been reached.

Sharma et al. (2016) discusses supply chain practices using SEM-ANN by highlighting green supply chain practices as a strategy for achieving performance, especially since problems face logistical issues. It is possible to identify the essential green supply chain practices to improve corporate performance. On the other hand, companies address production flexibility problems resulting from supply chains and logistics management issues. Therefore, it is possible to solve these problems by achieving high integration and coordination between the organization's external and internal parties by implementing cloud computing to solve supply chains' delays.

5 The Relationship Between eWOM and S-Commerce

S-commerce and eWOM with the advent of Web 2.0 and online interacting have begun coordinating new developments on their sites to offer customers with an interesting understanding (Friedrich 2015). Several studies have indicated the positive correlation between s-commerce and eWOM in online contexts and social media (Chen et al. 2012). Trust is considered as an essential factor to achieve social commerce (Meilatinova 2021). On the other side, Kuan and Bock (2007) discovered that consumers' confidence in an online website increases or decreases depending on their prior visits to that website. A study demonstrates that eWOM may convince an offline customer who has never browsed a firm's website to explore and trust the social commerce-enabled website of that company. Positive eWOM enables the management of s-commerce websites to market their products with major positive outcomes, such as establishing long-term relationships with potential clients. According to the studies, favorable customer eWOM is a significant factor in establishing customer

trust and determining the frequency of repeat purchases (Munnukka et al. 2015). Participants in s-commerce consider eWOM as a vital aspect for enhancing client trust in the context of s-commerce transactions (Alhulail et al. 2018). Anderson and Srinivasan (2003) examined the relationship between the level of customer trust and consumer reliability in e-commerce. Their research indicates that eWOM influences client confidence, which in turn affects consumer purchasing intentions and commitment. In addition, eWOM is necessary for social commerce managers to increase consumer trust, which will eventually encourage users to make purchases on their social commerce websites.

Therefore, positive eWOM enables businesses to successfully sell their products, create long-term relationships with clients, and become more profitable. eWOM has garnered a great deal of attention, yet social word of mouth is an unique notion. This term will soon be employed in marketing and information systems because of social media (Cheung and Thadani 2012). Therefore, s-commerce structures generate eWOM. eWOM is the most recent evolution using social media to expand customers' online communication capabilities (Hajli et al. 2013). Despite the perception that eWOM is independent of commercial social influence, it may be subject to commercial influence (Tan and Lee 2019). Social commerce has the potential to boost business transactions by developing strong contacts with customers, which is one of the rationales for social commerce (Hajli et al. 2014). When marketers invite consumers to participate in eWOM within the context of service interaction, eWOM activity rises; this is a result of having s-commerce in place (Söderlund and Mattsson 2015). Social media considers a vital factor to achieve s-commerce and eWOM (Linda 2010). Social media enables people to develop content and distribute it via Web 2.0 and Web 3.0 social platforms. Online consumer evaluations are informative and persuasive and make an effect on a firm's bottom line (Park et al. 2007). Social networking sites deliver a variety of channels for customers to cooperate with another to build rapport and gather information about the goods and services (Goraya et al. 2016). Customers establish effective connections through active communication, which benefits social commerce (Ortiz et al. 2017).

As probable customers often store for commodities and services based on the suggestions and opinions of former clients, those who have comparable experiences are more likely to spread the word of mouth. Thus, customers who have a higher level of trust in an e-commerce website are more willing to share their experiences via an online platform with existing and new customers. Consumers believe that social commerce could likewise influence e-word of mouth as well (Choi et al. 2017). The rise of online social networking sites, led by Facebook, has increased the impact of s-commerce on conventional marketplaces (Tan and Lee 2019). This form of word of mouth shares eWOM attributes of overcoming the constraints of s-commerce. The limited reach of direct s-commerce involvement and the rapid decline of this sort of influence with distance and time limit the effectiveness of the latter (Duan et al. 2008a, b). In contrast to e word of mouth, which is directed at one or more friends, eWOM employs communications with a one-to-several reach (Cheung and Thadani 2012). While the relationship between eWOM message validity and social commerce is clearly created (Fang 2014), there is a relationship between consumer decisions and

social commerce and word of mouth (Wang and Yu 2017). The impact of eWOM and other social networking site activities on consumer decisions is substantial (Liang and Turban 2011). S-commerce enables the consumer society, which focuses on the exchange of information that might assist consumers in making sensible choices (Wang et al. 2016).

In the marketing business, particularly s-commerce, consumers are more inclined to rely on decisions given by other consumers than on decisions distributed by firms. Therefore, consumers are more likely to continue using a product that has good eWOM-related messages than one that has negative ones. Information considers as a vital factor in the social commerce (Ali et al. 2020). S-commerce enables the transmission of data from one group of suggested users to another sub-group of users through eWOM and s-commerce platforms (Alhulail et al. 2018). In other words, the more beneficial information and insights consumers have about the product, the more likely customers are to continue purchasing goods and service (Allsop et al. 2007). Adoption of the word-of-mouth message is the most significant result of e word-of-mouth communication for marketing professionals, and adoption is often associated with social commerce (Li and Zhang 2011). Thus, positive e word of mouth must be a crucial aspect for firms to establish long-term relations with their clients. Existing research indicates that favorable consumer e word of mouth is a strong predictor of customer repurchase behavior (Karjaluoto et al. 2014).

6   Discussion

Our research has addressed the issue of how eWOM influences customer purchase intent in social e-commerce, as well as the mechanisms involved. Researchers have validated the importance of social media and trust in explaining customer acquisition intention from the position of adoption of consumer information. The findings suggest that customers' perceptions of trust in eWOM information lessen the social-emotional reserve between customers and information publishers, resulting in increased news trust (Zhao et al. 2020). S-commerce facilitates the relationship between eWOM and trust. This also emphasizes the need of developing strong community connections when analyzing the purchasing method (Hernández- Ortega 2018). The information source and consumer are strangers, and the perception of s-commerce between them is crucial to understanding why customers trust eWOM. When the customer senses a close association between the information of the purchasing process and the information publisher, confidence in the information grows. This trust is based on both emotion and reason. In e word of mouth, the information itself provokes cognitive and emotional responses in the recipient. Our research demonstrates the relationship between social media and purchasing decisions. Consumers benefit from the use of word-of-mouth marketing via social media because it allows them to get more advised acquiring decisions based on reliable facts. On the other side, decisions are based on social media reviews of items and services. The deeper the link between the consumer and social media sources through

e word of mouth, the more likely it is that the user would base purchase decisions on the information provided. This outcome is generally consistent with prior research. For instance, Gao et al. (2017) suppose that powerful sensitive and rational responses can increase consumers' purchase intent. Moreover, according to consumer behavior theories, customer perception and emotion are elements that influence consumer purchasing intent (Peck and Childers 2006).

7 Theoretical Implication

A significant weakness of prior research is that the ramifications for oral electronic communication and information have not been eliminated entirely. eWOM has always presented research challenges, leading to studies that show how online customer feedback information affects purchase decisions while ignoring how response content is formed and how comment quality affects social commerce, as well as a lack of attention to the processes of comment content formation. Companies make highly desirable goods that draw consumer attention through eWOM; companies also participate in a series of high-risk behaviors to invite more individuals to their online shopping. For instance, the widespread use of legitimate refunds by businesses is dishonest, in addition, false merchant reviews and massive billing make it impossible for consumers to discriminate between truth and fantasy. As a result, academics have focused their studies on the number, length, integrity, and reliability of word of mouth and its influence, as well as the emotional dimension of online consumer evaluations and social commerce coupled (Thomas et al. 2019). It has been challenging to conceive beyond the natural eWOM mode influence of e-commerce and social platforms to study repressed or hidden consumer opinion information. To circumvent this, we seek to determine how customer trust and social decisions' influence buy intentions via electronic eWOM. The findings indicate that communication medium has strong outcomes and psychosocial confidence of consumers. This study examines the impact of online shopping and social commerce experiences on customer behavior in electronic word of mouth and extends the application of motivation theory to electronic word of mouth (Zhang et al. 2019). The impact of social media on the pervasiveness and diversity of subjects, the formation of individual consumer decisions, and the opening of markets in an electronic social commerce environment is growing. Credibility and trust may enhance the value of social e-commerce knowledge (Hajli 2018). Consequently, consumers are more likely to discuss their purchasing experiences via eWOM. Recent advancements in this subject indicate that the influence of social and electronic commerce, proximity, and customer preference for social networks all impact the popularity of businesses (Bhowmick and Mitra 2019), and the rise of electronic eWOMC to consumers. In other words, cultural orientation, social influence, and other non-power-related elements influence customer behavior in eWOM versus social e-commerce within social networks (Lee and Choi 2019).

8 Managerial Implication

Social and corporate e-commerce platforms should be extremely interesting in our findings. Trust is a crucial aspect of s-commerce (Sharma et al. 2019). The content of information can improve the validity of search engine results, and the social impact of social e-commerce has flourished, which has a beneficial effect on mobile shopping and eWOM. Creating a social business ecosystem with a consumer focus should encourage e-commerce and social commerce. Scholars recognize that social e-commerce portals may successfully enhance information quality and content monitoring, hence enhancing user retention. Researchers also demonstrated that the psychosocial distance between the two parties of eWOM influences social power and performs a crucial role in the purchasing decisions of mobile and social media customers. This should motivate companies and consumers to enhance the flow of ideas and cultural trends for common advantage and to increase citizen involvement (Shao and Pan 2019). It should also facilitate the transformation of the interaction between the parties from transactional to collaborative. As this is one of the elements influencing customer purchasing intentions in social commerce, it is necessary to provide practical recommendations (Lin et al. 2019).

9 Conclusion

In conclusion, a theoretical model emphasizing the significance of eWOM in achieving consumer ongoing usage behavior within the e-commerce environment has been improved. In addition, this study makes a substantial contribution to the information structure by presenting a thorough structure for explaining the function of trust and consumer decisions in the interaction between the eWOM and consumer behavior in the setting of s-commerce. Few studies in the social commerce literature have investigated, validated, and tested the impact of eWOM on customer choices. Notably, this report also examined the significant influence that social media played in generating word of mouth among social commerce users. Due to the high level of unpredictability involved with s-commerce, trust, as shown by many of the criteria explored in this study, is of the utmost importance in influencing the consumer through eWOM. This study explored the effect of trust on e-commerce, and researchers discovered that trust might be transferred from well-known and trusted persons inside a social network to unknown parties that promote their products via social networks. This is an important finding that contributes to the research on online trust and reveals certain features that influence the trust of social commerce users. The findings of this study offer significant support for eWOM and consumer trust, which may be crucial for social networks and their sellers wishing to achieve success in s-commerce. First, as additional validation of the suggested model is required, the authors will collect data from customers with extensive social commerce experience to test the proposed

model and study the provided hypotheses in greater depth. The second contribution of this study is a visual representation of all s-commerce platforms. Due to the unique attributes of each platform, it is highly recommended to test it on Facebook or Twitter. This study analyzed the power of various elements of social commerce on customer confidence in e-commerce, as well as the effects of s-commerce on the role of eWOM and the purchase of goods and facilities (purchasing and eWOM intents). The study specifically examined the following e-commerce characteristics: trust, information, communications, consumer decisions, and eWOM. The findings of this study are somewhat compatible with those of past research (e.g., Kim and Park 2013). In other words, variables in the research model were positively associated with e-commerce trust. These results lend acceptance of the notion that e-commerce customers are more likely to have faith in e-commerce if it provides pleasant online environments in terms of consumer decisions, trust, information, communication, and eWOM. Internet has provided both difficulties and possibilities for eWOM. This study indicated that most consumers view internet reviews as trustworthy as brand websites, making social commerce more accessible. This study demonstrates the substantial effect that eWOM can have on customer decision-making. eWOM marketing diminishes the ability of firms to influence customers through marketing, advertising, and s-commerce channels, as contrasted to traditional commerce (Lis and Neßler 2014). eWOM proposes enterprises a new avenue to reach consumers and shape their impressions.

References

Ahmad SN, Laroche M (2017) Analyzing electronic word of mouth: A social commerce construct. Int J Inf Manage 37(3):202–213

Alhulail H, Dick M, Abareshi A (2018, June) The influence of word of mouth on customer loyalty to social commerce websites: trust as a mediator. In International conference of reliable information and communication technology. Springer, Cham, 1025–1033

Ali YS, Hussin ARC, Dahlan HM (2020) Electronic word of mouth engagement in social commerce platforms: An empirical study. Inf Dev 36(3):438–456

Allsop DT, Bassett BR, Hoskins JA (2007) Word-of-mouth research: Principles and applications. J Advert Res 47(4):398–403

Anderson RE, Srinivasan SS (2003) E-satisfaction and e-loyalty: A contingency framework. Psychol Mark 20(2):123–138

Bhowmick AK, Mitra B (2019) Listen to me, my neighbors or my friend? Role of complementary modalities for predicting business popularity in location based social networks. Comput Commun 135:53–70

Carroll B (2008) Social shopping: a new twist on e-commerce. Furniture Today 32(20):81

Chang S, Lu T, Song H (2016, December) Smartdog: Real-time detection of smartphone theft. In 2016 IEEE International Conference on Internet of Things (iThings) and IEEE Green Computing and Communications (GreenCom) and IEEE Cyber, Physical and Social Computing (CPSCom) and IEEE Smart Data (SmartData) (pp. 223–228). IEEE

Chen SC, Yen DC, Hwang MI (2012) Factors influencing the continuance intention to the usage of Web 2.0: An empirical study. Comp Human Behav 28(3):933–941

Chen SC (2011) Understanding the effects of technology readiness, satisfaction and electronic Word-of-Mouth on loyalty in 3C products. Australian Journal of Business and Management Research 1(3):1–9

Cheng X, Gu Y, Hua Y, Luo XR (2021) The paradox of word-of-mouth in social commerce: exploring the juxtaposed impacts of source credibility and information quality on SWOM spreading. Information & Management 58(7):103505

Cheung CM, Lee MK (2012) What drives consumers to spread electronic word of mouth in online consumer-opinion platforms. Decis Support Syst 53(1):218–225

Cheung CM, Thadani DR (2012) The impact of electronic word-of-mouth communication: A literature analysis and integrative model. Decis Support Syst 54(1):461–470

Cheung CMK, Lee MKO, Rabjohn N (2008) The impact of electronic word-of-mouth: The adoption of online opinions in online customer communities. Internet Res 18(3):229–247

Cheung MY, Luo C, Sia CL, Chen H (2009) Credibility of electronic word-of-mouth: Informational and normative determinants of online consumer recommendations. Int J Electron Commer 13(4):9–38

Cheung SY, Phillimore J (2014) Refugees, social capital, and labour market integration in the UK. Sociology 48(3):518–536

Choi YK, Seo Y, Yoon S (2017) E-WOM messaging on social media: Social ties, temporal distance, and message concreteness. Int Res 27(3): 495–505

Constantinides E, Fountain SJ (2008) Web 2.0: Conceptual foundations and marketing issues. J Direct Data and Digital Mark Pract 9(3):231–244

Curty RG, Zhang P (2011) Social commerce: Looking back and forward. Proceed American Soc Informat Sci Technol 48(1):1–10

Davis A, Khazanchi D (2008) An empirical study of online word of mouth as a predictor for multi-product category e-commerce sales. Electron Mark 18(2):130–141

Dennison L, Moss-Morris R, Chalder T (2009) A review of psychological correlates of adjustment in patients with multiple sclerosis. Clin Psychol Rev 29(2):141–153

Duan W, Gu B, Whinston AB (2008a) Do online reviews matter?—An empirical investigation of panel data. Decis Support Syst 45(4):1007–1016

Duan W, Gu B, Whinston AB (2008b) The dynamics of online word-of-mouth and product sales— An empirical investigation of the movie industry. J Retail 84(2):233–242

Fang YH (2014) Beyond the credibility of electronic word of mouth: Exploring eWOM adoption on social networking sites from affective and curiosity perspectives. Int J Electron Commer 18(3):67–102

Friedrich T (2015) *Analyzing the factors that influence consumers' adoption of social commerce–A literature review*

Gao L, Li W, Ke Y (2017) The influence of Internet word-of-mouth on consumers' purchase intention in socialized business: the mediating role of emotional reaction and the regulation of curiosity. J. Ind. Eng. Eng. Manage. 31(4):15–25

Goraya M, Jing Z, Shareef MA, Imran M, Malik A, Akram MS (2021) An investigation of the drivers of social commerce and e-word-of-mouth intentions: Elucidating the role of social commerce in E-business. Electron Mark 31(1):181–195

Gupta P, Harris J (2010) How e-WOM recommendations influence product consideration and quality of choice: A motivation to process information perspective. J Bus Res 63(9–10):1041–1049

Ha H-Y (2006) The effects of consumer risk perception on pre-purchase information in online auctions: Brand, word-of-mouth, and customized information. J Computer-Mediated Commun, 8, article 2.

Hajli M, Hajli M, Khani F (2013, April) Establishing trust in social commerce through social word of mouth. In 7th International Conference on e-Commerce in Developing Countries: with focus on e-Security. IEEE, pp 1–22

Hajli N (2015) Social commerce constructs and consumer's intention to buy international. J Inf Manag 35(2):183–191

Hajli N (2018) Ethical environment in the online communities by information credibility: a social media perspective. J Bus Ethics 149(4):799–810

Hajli N, Lin X, Featherman M, Wang Y (2014) Social word of mouth: How trust develops in the market. Int J Mark Res 56(5):1–18

Hennig-Thurau T, Gwinner KP, Walsh G, Gremler DD (2004) Electronic word-of-mouth via consumer-opinion platforms: what motivates consumers to articulate themselves on the internet? J Interact Mark 18(1):38–52

Hernández-Ortega B (2018) Don't believe strangers: Online consumer reviews and the role of social psychological distance. Information & Management 55(1):31–50

Herrando C, Jiménez-Martínez J, Hoyos MD, José M (2017) Passion at first sight: how to engage users in social commerce contexts. Electron Commer Res 17(4):701–720

Hidayat-ur-Rehman I, Alzahrani S, Rehman MZ, Akhter F (2022) Determining the factors of m-wallets adoption. A Twofold SEM-ANN Approach. Plos One 17(1):e0262954

Huang Z, Benyoucef M (2013) From e-commerce to social commerce: A close look at design features. Electron Commer Res Appl 12(4):246–259

Huang Z, Benyoucef M (2015) User preferences of social features on social commerce websites: An empirical study. Technol Forecast Soc Chang 95:57–72

Hung KH, Li SY (2007) The influence of eWOM on virtual consumer communities: Social capital, consumer learning, and behavioral outcomes. J Advert Res 47(4):485–495

Islam AN, Laato S, Talukder S, Sutinen E (2020) Misinformation sharing and social media fatigue during COVID-19: An affordance and cognitive load perspective. Technol Forecast Soc Chang 159:120201

Ismagilova E, Dwivedi YK, Slade E, Williams MD (2017) Electronic word of mouth (eWOM) in the marketing context: A state of the art analysis and future directions. Springer International Publishing, Cham

Jalilvand MR, Esfahani SS, Samiei N (2011) Electronic word-of-mouth: Challenges and opportunities. Procedia Computer Science 3:42–46

Jansen BJ, Zhang M, Sobel K, Chowdury A (2009) Twitter power: Tweets as electronic word of mouth. J Am Soc Inform Sci Technol 60(11):2169–2188

Jeong E, Jang SS (2011) Restaurant experiences triggering positive electronic word-of-mouth (eWOM) motivations. Int J Hosp Manag 30(2):356–366

Karakaya F, Ganim Barnes N (2010) Impact of online reviews of customer care experience on brand or company selection. J Consum Mark 27(5):447–457

Karjaluoto H, Munnukka J, Tikkanen A (2014) Are facebook brand community members really loyal to the brand? 27th Bled eConference eEcosystems, 169–180.

Kim S, Park H (2013) Effects of various characteristics of social commerce (s-commerce) on consumers' trust and trust performance. Int J Inf Manage 33(2):318–332

Kim YA, Srivastava J (2007, August) Impact of social influence in e-commerce decision making. In Proceedings of the ninth international conference on Electronic commerce, pp 293–302

Kuan HH, Bock GW (2007) Trust transference in brick and click retailers: An investigation of the before-online-visit phase. Information & Management 44(2):175–187

Lee KY, Choi H (2019) Predictors of electronic word-of-mouth behavior on social networking sites in the United States and Korea: Cultural and social relationship variables. Comput Hum Behav 94:9–18

Leong LY, Hew TS, Ooi KB, Wei J (2020) Predicting mobile wallet resistance: A two-staged structural equation modeling-artificial neural network approach. Int J Inf Manage 51:102047

Liang TP, Turban E (2011) Introduction to the special issue social commerce: a research framework for social commerce. Int J Electron Commer 16(2):5–14

Liang TP, Ho YT, Li YW, Turban E (2011) What drives social commerce: The role of social support and relationship quality. Int J Electron Commer 16(2):69–90

Liébana-Cabanillas F, Marinković V, Kalinić Z (2017) A SEM-neural network approach for predicting antecedents of m-commerce acceptance. Int J Inf Manage 37(2):14–24

Liébana-Cabanillas F, Marinkovic V, de Luna IR, Kalinic Z (2018) Predicting the determinants of mobile payment acceptance: A hybrid SEM-neural network approach. Technol Forecast Soc Chang 129:117–130

Liébana-Cabanillas F, Singh N, Kalinic Z, Carvajal-Trujillo E (2021) Examining the determinants of continuance intention to use and the moderating effect of the gender and age of users of NFC mobile payments: A multi-analytical approach. Inf Technol Manage 22(2):133–161

Lin J, Luo Z, Cheng X, Li L (2019) Understanding the interplay of social commerce affordances and swift guanxi: An empirical study. Information & Management 56(2):213–224

Lin X, Li Y, Wang X (2017) Social commerce research: Definition, research themes and the trends. Int J Inf Manage 37(3):190–201

Linda SLAI (2010) Social commerce–e-commerce in social media context. World Acad Sci Eng Technol 72:39–44

Lis B, Neßler C (2014) Electronic word of mouth. Bus Inf Syst Eng 6(1):63–65

Loh XM, Lee VH, Hew TS, Lin B (2022) The cognitive-affective nexus on mobile payment continuance intention during the COVID-19 pandemic. Int J Bank Market

Marsden P (2011) Commerce gets social: How your networks are driving what you buy. Social Commerce Today.

Meilatinova N (2021) Social commerce: Factors affecting customer repurchase and word-of-mouth intentions. Int J Inf Manage 57:102300

Munnukka J, Karjaluoto H, Tikkanen A (2015) Are Facebook brand community members truly loyal to the brand? Comput Hum Behav 51(2):429–439

Nikbin D, Ismail I, Marimuthu M, Armesh H (2012) Perceived justice in service recovery and switching intention: Evidence from Malaysian mobile telecommunication industry. Manage Res Rev

Ooi KB, Tan GWH (2016) Mobile technology acceptance model: An investigation using mobile users to explore smartphone credit card. Expert Syst Appl 59:33–46

Ortiz J, Chih WH, Teng HC (2017) Electronic word of mouth in the Taiwanese social networking community: participation factors. Internet Research

Parise S, Guinan PJ (2008) Marketing using Web 2.0. In Sprague R (ed.), Proceedings of the 41st Hawaii International Conference on System Sciences, Hawaii, HI, January 2008, IEEE Computer Society Press, Washington, DC

Park DH, Kim S (2008) The effects of consumer knowledge on message processing of electronic word-of-mouth via online consumer reviews. Electron Commer Res Appl 7(4):399–410

Park DH, Lee J, Han I (2007) The effect of online consumer reviews on consumer purchasing intention: The moderating role of involvement. Int J Electron Commer 11(4):125–148

Peck J, Childers TL (2006) If I touch it I have to have it: Individual and environmental influences on impulse purchasing. J Bus Res 59(6):765–769

Ray A, Bala PK, Rana NP (2021) Exploring the drivers of customers' brand attitudes of online travel agency services: A text-mining based approach. J Bus Res 128:391–404

Rehman IHU, Ahmad A, Akhter F, Aljarallah A (2021) A Dual-stage SEM-ANN analysis to explore consumer adoption of smart wearable healthcare devices. J Global Inf Manage (JGIM) 29(6):1–30

Richins ML, Root-Shaffer T (1988) The role of involvement and opinion leadership in consumer word-of-mouth: An implicit model made explicit. Adv Consum Res 15:32–36

Senecal S, Nantel J (2004) The influence of online product recommendations on consumers' online choices. J Retail 80(2):159–169

Shao Z, Pan Z (2019) Building Guanxi network in the mobile social platform: A social capital perspective. Int J Inf Manage 44:109–120

Sharma SK, Sharma M (2019) Examining the role of trust and quality dimensions in the actual usage of mobile banking services: An empirical investigation. Int J Inf Manage 44:65–75

Sharma SK, Joshi A, Sharma H (2016) A multi-analytical approach to predict the Facebook usage in higher education. Comput Hum Behav 55:340–353

Sharma S, Menard P, Mutchler LA (2019) Who to trust? Applying trust to social commerce. Journal of Computer Information Systems 59(1):32–42

Shen J (2012) Social comparison, social presence, and enjoyment in the acceptance of social shopping websites. J Electron Commer Res 13(3):198

Söderlund M, Mattsson J (2015) Merely asking the customer to recommend has an impact on word-of-mouth activity. J Retail Consum Serv 27:80–89

Stauss B (1997) Global word of mouth: Service bashing on the internet is a thorny issue. Market Manage 6(3): 28

Stauss B (2000) Using new media for customer interaction: A challenge for relationship marketing. In Relationship Marketing (pp. 233–253). Springer, Berlin, Heidelberg.

Steffes EM, Burgee LE (2009) Social ties and online word of mouth. Internet Res 19(1):42–59

Tan W-K, Lee B-Y (2019) Investigation of electronic-word-of-mouth on online social networking sites written by authors with commercial interest. Online Inf Rev 43(3):462–480

Thomas MJ, Wirtz BW, Weyerer JC (2019) Determinants of online review credibility and its impact on consumers' purchase intention. J Electron Commer Res 20(1):1–20

Wang C, Zhang P (2012) The evolution of social commerce: The people, management, technology, and information dimensions. Commun Assoc Inf Syst 31(5):105-127.

Wang T, Yeh RKJ, Chen C, Tsydypov Z (2016) What drives electronic word-of-mouth on social networking sites? Perspectives of social capital and self-determination. Telematics Inform 33(4):1034–1047

Wang Y, Yu C (2017) Social interaction-based consumer decision-making model in social commerce: The role of word of mouth and observational learning. Int J Inf Manage 37(3):179–189

Xuan T, Guo S, Bai W, Zhou T, Wang L, Xie RJ (2022) Ultrastable and highly efficient green-emitting perovskite quantum dot composites for Mini-LED displays or backlights. Nano Energy 95:107003

Zhang H, Lu Y, Gupta S, Zhao L (2014) What motivates customers to participate in social commerce? The impact of technological environments and virtual customer experiences. Information & Management 51(8):1017–1030

Zhang X, Ma L, Wang GS (2019) Investigating consumer word-of-mouth behaviour in a Chinese context. Total Qual Manag Bus Excell 30(5–6):579–593

Zhao Y, Wang L, Tang H, Zhang Y (2020) Electronic word-of-mouth and consumer purchase intentions in social e-commerce. Electron Commer Res Appl 41:100980

Zheng X, Men J, Xiang L, Yang F (2020) Role of technology attraction and parasocial interaction in social shopping websites. Int J Inf Manage 51:102043

Zhou L, Zhang P, Zimmermann HD (2013) Social commerce research: An integrated view. Electron Commer Res Appl 12(2):61–68

Zwass V (2010) Co-creation: Toward a taxonomy and an integrated research perspective. Int J Electron Commer 15(1):11–48

Ali Shakir Zaidan is a lecturer at University of Baghdad in Iraq. He is now a PhD student in business administration at the School of Management, Universiti Sains Malaysia. He is a researcher, who has published research in various journals. He serves as a reviewer for several journals. He can be reached at sha3883@student.usm.my.

XinYing Chew is a Senior Lecturer in the School of Computer Sciences, Universiti Sains Malaysia. She holds a PhD in statistical quality control from Universiti Sains Malaysia. Her areas of research are in Industrial Computing, Statistical Quality Control, Advanced Analytics (Machine Learning & Deep Learning). She has featured in prominent international publications. Her efforts and excellence have been acknowledged and awarded at several dignified platforms. She can be reached at xinying@usm.my.

Khai Wah Khaw is a Senior Lecturer in the School of Management, Universiti Sains Malaysia. He holds a PhD in statistical quality control from Universiti Sains Malaysia. He is a coordinator

of the Business Analytics Program in the School of Management, USM. His areas of research are in advanced analytics and statistical quality/process control. He has featured in prominent international publications. His efforts and excellence have been acknowledged and awarded at several dignified platforms. He is actively involved in conducting training in statistics and visualization. Prior to his academic career, he worked in a renowned U.S. multinational company as a Data Analytics Team Leader.

Marcos Ferasso holds a bachelor's degree in Business Administration (2002) and a Specialist in Business Management (2005) from the Universidade do Oeste de Santa Catarina, São Miguel do Oeste campus, Santa Catarina, Brazil. International Specialist in Local Development (2006) by the International Labor Organization, United Nations, Turin, Piedmont, Italy. Master's in business administration from the Federal University of Rio Grande do Sul, with a Masters internship at Euromed-Marseille Ecole de Management in Marseille, Région Provence-Alpes-Côte DAzur, France (2008), where he worked as Visiting Professor (Exchange student). Doctor in Business Administration from Universidade Federal do Paraná with doctoral internship at Forsyth Technical Community College in Winston-Salem, North Carolina, United States of America (2018). His doctoral degree was recognized in Portugal by the University of Aveiro on 01/04/2021.

Determinants of Customer Intentions to Use Social Commerce

Hasan Oudah Abdullah, Hadi Al-Abrrow, Nadia A. Atshan, and Sammar Abbas

1   Introduction

Customer intentions are the main determinant of gaining a better market share than others; therefore, the customer has attracted the interest of academics and practitioners (Ardani et al. 2019). The emotional and cognitive response largely determines customers' intentions toward purchasing services and products (Alsaggaf and Althonayan 2018). According to the Mehrabian and Russell (1974) model, cognitive and emotional stimuli create a climate that motivates customers to engage in purchases (Alsaggaf and Althonayan 2018). The emotional climate includes three main areas: pleasure, excitement, and dominance. These three domains appear in each emotional response to the surrounding physical and social environment. The three areas are what constitute the emotional response which subsequently influences the individual's behavioral intentions. Pleasure explains the degree of harmony between an individual and the surrounding environment, which includes individual reactions to the surrounding environment (Sweeney and Wyber 2002). As for arousal, it represents a function of the nervous structure that indicates alertness and readiness toward stimuli and constitutes readiness for them. Effects are the tool responsible for how the

H. O. Abdullah
Basra University College of Science and Technology, Basrah, Iraq
e-mail: Hauni_2000@yahoo.com

H. Al-Abrrow (✉)
Business Administration Department, University of Basrah, Basrah, Iraq
e-mail: Hauni_2000@yahoo.com

N. A. Atshan
Southern Technical University, Management Technical College, Basrah, Iraq

S. Abbas
Institute of Business Studies, Kohat University of Science and Technology (KUST), Kohat, Pakistan
e-mail: sabbas@kust.edu.pk

97

individual responds in general to stimuli that occur outside and excite the individual from the inside. As for dominance, it refers to the high control of environmental stimuli surrounding the emotional reactions that occur in the emotional response of the individual (Mehrabian 1976).

Customer intent to buy is a measure of how likely each customer is to purchase a product or service. That is, it is "the sum total of cognitive, emotional, and behavioral attitudes toward the adoption, purchase, and use of certain products, services, ideas, or behaviors" (Dadwal et al. 2020). It may seem that the concept is simple, but when you look at it in practice, it is not noticed that it is a concept that is not classified as something black or white. It is a relative concept that cannot be answered with a yes or no. In this context, there are several types of customer intentions via the Internet, this matter is very important regarding electronic commerce, and what are the necessary measures to be taken to develop that trade (Schultz 2020; Yusuf et al. 2019). These types are: **(1) Informational intent**, this type of intent relates to the stage concerned with how customers gather information for purchase. At this stage, customers are looking for answers to vague questions they have or trying to increase their awareness and culture regarding a particular product or service that they do not have enough information about. When a customer wants to learn about a new product that he has not used before, his initial intentions will be toward information about the class of products that fulfill the purpose, not the product itself. Here, e-commerce pioneers can take advantage of this for the benefit of their business. This can be done through the nature of the promotional content that they target the relevant customers. **(2) Investigative intent**, in the post-information stage, customers tend to compare the options available to them according to specific criteria and preferences related to personal and cultural aspects. They are not willing to buy, but they check the products that meet their need by reviewing the people close to them or the social networks surrounding them. This stage takes a lot of time and effort because of the many options available through social networks. This stage is confusing and stressful for the customer's intentions. For example, you see that the search key preceded by the word "better" is constantly increasing. **(3) Navigational intent**, this intention relates to the intent of the customer who is looking for a specific category or brand. This is not related to the marketer and his marketing activity, but rather it is a matter that may be the result of a prior interaction between the customer and that brand. This intention represents the penultimate step of the customer's intention to purchase a specific product or service. With this, the marketer should strive to develop communication channels with customers and make them easy to use to maintain positive intentions toward the brand, as well as to enhance it. **(4) Transactional intent**, this intent refers to the customer's actual thought of making a purchase. This intent represents people who have a strong inclination to want, or they have made a purchase decision and intend to convert it into an actual behavior toward a particular product or service. This type of intent varies from customer to customer and from brand to brand, but in general it is closer to—more than at any time—than an actual purchase.

Customer intention represents a dependent variable affected by many factors, it indicates the degree of inclination of the customer to buy a particular product or service. Customer intentions are a measure of a customer's attitude toward purchasing

a product or using a service. There is great importance for the intentions of customers for marketers, as it is an important measure of the extent of the turnout or orientation toward a particular brand, product, or service (Holt et al. 2018). This process helps marketers to design and redesign marketing programs and promotional activities in the communication process. Marketing activities represent external regulation or motivation, while customer intentions represent internal organization or motivation. On this basis, there is a need to design external stimuli in a way that enhances internal stimuli in order to transform intentions into behavior (Wu 2020).

On this basis, building marketing based on customer intentions increases the return on investment of marketing activities. Therefore, there is an ongoing quest for how to explore or measure purchasing intentions either objectively or subjectively. It may be measured through behavioral data or the level of interaction (Gevelber 2015). Measuring those intentions helps marketers decide where to start. The general awareness of customers toward a particular brand affects in one way or another the marketing activities that target a particular customer group. Therefore, there is a need to measure purchase intent to achieve marketing benefits (Dlodlo and Mahao 2020). Search engines and social networking sites are one of the most important sources of data collection at the present time. A huge amount of information is exchanged daily regarding products and services that are paid for through electronic commerce. Therefore, many marketers go to make it a tool to measure the purchase intentions of the customer (Dixon-Ogbechi and Ladipo 2022). Furthermore it, attention and focus on the intent of the customer have become parallel to the interest in the demographic characteristics of the customer in e-commerce. Many experiences have proven that relying on demographic characteristics to target customers threatens e-commerce with the loss of many shoppers (Gevelber 2015). Thus, the lack of necessary attention to the intentions of customers will lead to the neglect of a large part of the segment of potential customers (Laoviwat et al. 2014).

However, we must understand that the intent to buy is not permanent that can be relied on continuously; therefore, it is difficult to segment the market based on intent. Alternatively, customers' purchasing intentions can be used as situational variables that help marketers segment the market effectively and efficiently (Dlodlo and Mahao 2020). Therefore, the customer's intent does not represent an actual desire to buy. Intention is a mechanism through which the actual purchase behavior can be explained. On this basis, the intent to buy is expressly expressing the desire to buy through the behaviors of willingness to buy. The second form of intention is implicit, which is represented by the complexity and further analysis of the cognitive and emotional component of the individual (Estelami and O'Connor 2019). The relationship between customer intent and demographics to predict actual purchase can be illustrated by Fig. 1:

The above figure shows us that it is possible to rely on demographic variables for market segmentation and targeting. Market segmentation attempts to bolster demographics with the explicit and implicit intentions of potential customers. Therefore, to create purchasing intentions for customers, electronic commerce tools must be harnessed for the purpose of identifying customers' intentions, starting with the information and ending with the actual purchase decision.
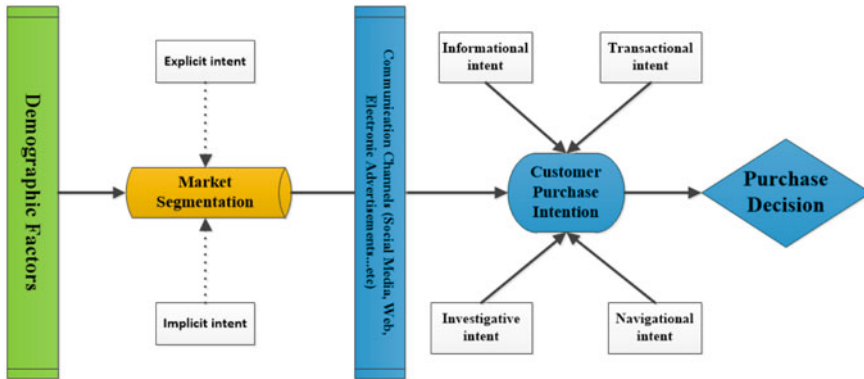
Fig. 1 Customer intent and demographics to predict actual purchase

2 Social Commerce

2.1 Concept of Social Commerce

Social commerce is used in today's market by relying on social networking sites such as Facebook, Instagram, and Twitter. Social commerce uses social networking tools for the purpose of promoting and selling products and services. The effectiveness and efficiency of social commerce is measured by levels of interaction, likes, participation, and forwarding of posts and changes to products and services (Liang and Turban 2011). Social commerce professionals create interactive posts and content for the purpose of increasing sales and stimulating social commerce. This is done through surveying the opinion of customers and encouraging their opinion through interaction or comments. In addition to many online social tools for the purpose of activating and marketing products and services (Hu et al. 2019), e-commerce that supports its activities through social networks is called social commerce. Social commerce seeks to accelerate and enhance the sale of products and services by understanding the dynamics of virtual communities (Molinillo et al. 2018). It goes beyond the traditional trading principles of buying and selling, to making electronic commerce tools the distinguishing mark in the buying and selling process. Accordingly, it can be said that social commerce represents marketing tools and methods for wholesale or retail sales (Lin et al. 2019). These tools integrate the service provider and the beneficiary into virtual social networks that facilitate the actual exchange process. Finally, social commerce is an amalgamation of social networks with e-commerce as shown in Fig. 2.

The harmonization of social commerce and social shopping allows efficient selling and marketing of products and services. However, the difference between social commerce and social marketing is that the former focuses on connecting sellers with each other, while the latter focuses only on customers. Finally, there are four features

Fig. 2 Social networks with e-commerce

of social commerce which are, (1) the sellers may be individuals or companies, (2) these sellers contribute to the creation of product bundles to form online stores, (3) sellers can link similar stores to sell homogeneous products, and (4) commissions are exchanged between different sellers, whether from their personal stores or from other stores in which they were commercial intermediaries (Molinillo et al., 2018; Monfared et al., 2021).

2.2   Factors that Influence on Social Commerce

Social commerce has become very popular. Its ability to grow and increase sales made it attractive to entrepreneurs. It is also characterized by high potential in understanding and responding to customers in a timely manner, through social networking tools and social networks (Friedrich 2015). The correlation between the concepts of electronic commerce and social commerce is very large. E-commerce is the participation of customers in the electronic exchange of goods. As for social trade, it represents the process of exchange with direct or indirect purchasing behavior, i.e., eWOM (Zhang et al. 2014). There are many factors that may limit or enhance social trade on the ground. Sohn and Kim (2020) argue that there are five factors that influence electronic commerce: economics, necessity, reliability, interaction, and sales promotion. These factors also influence customers' buying intentions, and thus the effectiveness of social commerce. According to Friedrich (2015) and through a review of 38 studies, the five most influential factors in social commerce are trust, usefulness, social presence, social influence, social commerce components, website quality, and ease of use.

Trust, information quality, and perceived usefulness are the most influential factors in consumers' inclinations to participate in social commerce. Trust in social networks and their operators is the most important factor in social commerce. The accuracy of the information also contributes to predicting the expected benefit, which makes the customer confident in participating or not (Maia et al. 2018). According to Friedrich (2016), trust according to several studies is the most important factor regarding customer participation in social commerce. Trust makes the customer reassured that the other party would fulfill its obligations in the agreed manner (Zhang et al. 2014). Moreover, there are indications that trust and customer satisfaction are factors that

Table 1 The most influential factors in social commerce

N	Factors	Important	N	Factors	Important
1	Trust	17	8	Value	5
2	Usefulness	11	9	Social support	4
3	Social presence	7	10	Enjoyment	4
4	Social influence	6	11	Satisfaction	4
5	Social commerce components	6	12	Commitment	3
6	Website quality	6	13	Familiarity	3
7	Ease of use	5	14	Relationship quality	2

also affect purchase intentions in e-commerce. The mediation of social networks increases the need for transactions in social commerce to provide the necessary confidence and sufficient customer satisfaction in social commerce transactions (Attar et al. 2020). Finally, and based on the study of Friedrich (2015) which reviewed the relevant studies, the most important factors affecting customers' intentions for social commerce can be presented according to Table 1.

2.3 The Customer Purchasing-Decision Process

Attempting to understand the behavior of purchasing decisions has increased in the recent period. The transition to e-commerce made it imperative for academics to review the traditional purchasing decision process. In this context, this process and its stages will be discussed from two perspectives. The first is the administrative one, and the second is the marketing one (Turban et al. 2016). From a management perspective, the purchase decision is influenced by financial, social, and cultural conditions and involves five stages. In social commerce, it is not required that customers move from one step to another in succession, as this matter varies from one customer to another and from one case to another (Mou and Benyoucef 2021). For example, the customer may see at some stage that he needs to go back to the previous stage, or he may skip a step because he feels that it is not important or necessary. The four stages will be dealt with from the point of view of social commerce and agencies (Riyadi and Rangkuti 2016; Adhiansyah et al. 2020; Genoveva and Utami 2020).

1. Determining the need: The first step is for the customer to realize a need. The need arises through his awareness of the existence of a gap between his current physiological or psychological state and his desired state. For example, an individual may realize that he or she needs a computer with a newer specification. The customer identifies the need through external stimuli or internal motives. But during commerce that relies on social networks, the stimuli that the individual is exposed to daily through social communication may not only alert the need but may create a need that did not exist.

2. Verification of information: After realizing the need that the customer seeks to satisfy, the customer tries to find an answer to two questions: What is the product to be purchased? What is the party to buy from? The customer may start by searching for the product and then the product provider, and sometimes he searches for both. At this stage, social commerce has made this process easier by having many applications that support search and comparison operations.
3. Purchase and delivery decision: The result of the previous step will be either to return to the first steps for lack of conviction, or to make a final decision on the product to be purchased. The processes of buying, delivering, and paying in social commerce are much easier than in traditional commerce.
4. Post-Purchase: A lot of sellers fail just because they are inactive at this point. Some sellers focus only on selling and neglect the need to retain customers over the long term. Some large organizations seek to take the opinions of customers at regular intervals and respond to suggestions and complaints. Communication with customers after purchase is very important in social commerce. This step is considered the most common problem in social commerce because it determines the level of trust of the customer toward the seller.

As for the marketing aspect, according to Turban et al. (2016), the model for deciding to buy passes through three stages:

1. Awareness and knowledge of product features and benefits: This is a cognitive stage that takes place inside the customer's mind.
2. Attitude toward the product (positive or negative): This stage revolves around the customer's feelings, such as fascination or lack of fascination or product preference and the degree of satisfaction after purchase.
3. Behavior: Behavior involves an action a customer takes, such as buying, repurchasing, writing a review of a product online, or visiting a website.

Purchasing decision depends on customers' attitudes toward products and services. In social commerce, attitudes are not only limited to the product, but the result of the experience of dealing with social networks will largely determine the customer's position on whether to buy or not. Awareness, attitude, and behavior are stages that do not take place in a linear fashion, but that customers can start from any stage and reach the actual purchase. This depends on the time and previous experiences of the customer. The customer who is aware of a particular brand and has a positive attitude toward it will perform the last stage, which is the buying behavior (Turban et al. 2016; Mou and Benyoucef 2021). Figure 3 illustrates these stages.

2.4 Customer Intentions and Social Commerce

As we said earlier, the individual by his human nature is influenced by his intentions through external factors and internal motives. Social commerce attempts to socialize the customer's attitudes and intentions toward one brand and not another.

Fig. 3 Social commerce brand decision process (*Source* Turban E, Strauss J, Lai L (2016) Supporting theories and concepts for social commerce. In Social Commerce, pp 53)

Competition is intense and widespread, and the successful seller is the one who can influence customers faster and more effectively than others. Thus, the customer's intent to buy is through interaction, attachment, socialization, and personalization of social commerce (Liu et al. 2021). We can also say that confidence is the most important factor in predicting purchase intentions. This importance can be explained by recognizing the levels of trust and credibility that the customer feels in the process of searching for information, familiarity with the platform, and social presence (Hajli et al. 2017).

In the same vein, the cost of using technology in social carpentry affects purchase intentions. Factors and transportation costs greatly influence buyers' intentions (Sun et al. 2019). The degree of risk perceived by the customer also influences purchasing intentions. The customer realizes that the experience of trading via the Internet is a new experience in which transactions are conducted remotely, and therefore, there is a potential risk that may occur. The customer may not have an actual perceived risk, but he is experiencing a sense of fear of "that new thing" that replaces the actual purchase (Lăzăroiu et al. 2020). On the other hand, pleasure and accessibility are also factors that indirectly contribute to buying intentions through social trading tools. Ease and fun are inseparable from the rest of the other factors. When the customer feels that using the platform is relatively easy and enjoyable, this relieves the anxiety and perceived danger of the new trading experience. In addition, confidence will eventually be high when fun and ease are achieved (Adhiansyah et al. 2020).

Based on the foregoing, it becomes clear that the main objective of social trading is to create positive intentions toward the target brand or product. Achieving this goal requires designing and redesigning electronic platforms in a way that contributes to increasing confidence and security, and at the same time removing the complexity of use. This is evident in the attempt of many famous platforms such as Facebook, Instagram, WhatsApp, and Twitter to issue updates from time to time. These updates are in which these platforms try to increase security on the one hand and increase the fun and ease of use on the other (Mikalef et al. 2017). The conclusion that must be said is that marketers and owners of social platforms must understand that the opinions and desires of customers are important on the one hand, and on the other hand are of great benefit in re-designing the content of promotional programs, and on the other hand, it is very important to follow the feedback that occurs using customers for trade social.

2.5 Enhancing Consumer Online Purchase Intention Through Perspective of Cognitive Evaluation Theory

Cognitive evaluation theory is a theory of a psychological nature that explains the effect of the results of external stimuli on the internal motivations of individuals. The theory argues about the concept of "intrinsic motivation." The theory suggests that individuals are more inclined to engage in activities when they feel that the experience of those activities will be enjoyable (Xu et al. 2020). According to Deci and Ryan (2010), there are three types of motivation: extrinsic regulation, intrinsic regulation, and intrinsic motivation. On this basis, the focus was largely on the intrinsic motive and the antecedents that contribute to the emergence of that motive. Intrinsic motivation has been defined as the subjective satisfaction and satisfaction with experiencing an idea or event. The reason for focusing on intrinsic motivation is that it ensures that the cognitive component of the individual continues to think in the same direction and force toward a particular goal (Cerasoli et al. 2014). However, despite the intrinsic and subjective character of the motive, the continuity of its direction depends largely on the efforts and endeavors made to create conditions and an environment that support that tendency in the individual. In general, the conditions and environment that create factors that promote feelings of self-efficacy, respect, and independence will enhance the psychological needs of individuals, and those in turn will support the intrinsic motivation toward a particular idea or event (Chae et al. 2017).

Consumer intentions represent a cognitive and emotional response that may be positive or negative (Nusairat et al. 2020). The intrinsic drive for potential pleasure stems from the potential feelings of doing a particular thing (Gunden et al. 2020). Thus, fun, curiosity, and enjoyment can be intrinsic motivators. Intrinsic motivation crystallizes through the individual's interest in a particular event without the other. The individual will show anticipatory satisfaction with the event based on his

positive probabilities toward that event (Lin et al. 2020). Consumer pleasure is an important predictor of intent, as it tells how likely the consumer is to prefer a particular brand (Nusairat et al. 2020). It should be mentioned that pleasure explains why there are intentions, and not the decision to buy or not. On this basis, understanding the buying process related to intentions requires understanding the levels of customer engagement with external stimuli.

According to Means-End Chain (MEC) theory, the customer keeps in memory his experiences with products and services at three levels (Gutman 1982). The first level represents quality, which refers to the attempt to compare the perceptions and expectations of customers about the product or service (Lages and Fernandes 2005). The second level represents value, which refers to the comparison between the perceived quality and the sacrifice required to obtain it (Lin et al. 2020). Finally, the third level represents the perception of the actual performance of the product or service (Nusairat et al. 2020). Intentions to purchase a customer can be represented at the first level by searching for and verifying information and intentions to obtain and verify it, while the second level represents the intentions to compare the information with others and narrow the alternatives to fewer alternatives. As for the third level, it refers to the intentions that will be in future because of a current experience.

3 Electronic Word Of Mouth (eWOM)

3.1 Concept of eWOM

The concept of electronic word of mouth (eWOM) was discussed in the 1990s with the onset of technological development and communication networks. Electronic word of mouth eWOM has become the most effective tool for social commerce. eWOM has become important in all industries, as many industries have moved from traditional commerce to social commerce. The internet and social networks that are widely spread have greatly helped eWOM to grow and spread (Zhang and Benyoucef 2016). eWOM can be defined as the exchange and sharing of information between customers about a particular brand via the Internet and social media applications. eWOM is a cornerstone of social commerce. Conversations conducted through eWOM increase the likelihood that information about the brand will reach the largest number of consumers. Therefore, eWOM is associated with a lot of marketing practices. Many studies have concluded that eWOM has had a significant impact on sales volume, customer satisfaction, and customer acquisition and retention. eWOM is an important tool for social commerce, as it reduces traditional marketing costs by making customers promote for free (Filieri et al. 2021; Verma and Yadav 2021).

The basic idea of eWOM is that customers originally exchange information about their business experiences with each other orally. Considering the current virtual world, technical development and the growth of digital programming, people are communicating in the form of virtual communities on social networking sites, and

the exchange of information has become faster and more widespread (Tobon and García-Madariaga 2021). Through their posts, comments and likes on posts related to a particular brand or product, individuals exchange information with each other. On the other hand, eWOM feedback not only benefits producers, but also helps other customers find products that meet their needs (Shen 2021).

3.2 WOM vs. eWOM

The revolutions that occurred in information technology, digital technologies, and semiconductors made the development of websites and mobile applications at an accelerating pace. In this context, word of mouth (WOM) was an important thing, but it's not the main thing in marketing. The focus was mainly on traditional advertising channels such as radio, television, and newspapers. With the rapid technological development, he brought out the concept of electronic oral speech (eWOM), which is now considered one of the most important things that affect the market and consumers (Huete-Alcocer 2017). Thus, information technology, which has changed human life in general, is what distinguishes WOM from eWOM. Table 2 presents the main differences between the two concepts.

Through what was presented in the table above, it becomes clear to us that the spread of eWOM does not mean abandoning WOM. WOM can provide advantages even at this time, on top of these advantages is the high credibility and privacy that it guarantees during the search process (e.g., Williams et al. 2019; Porter 2017; Ledikwe et al. 2020). According to Porter (2017), there are similarities between WOM and

Table 2 Differences between WOM and eWOM

	WOM	eWOM
Setting	Offline and Physical	Online and Virtual
Credibility	Information between two parties who know each other (high credibility)	Both parties often do not know each other (little credibility)
Privacy	The transmission of information is private and personal and often takes place face to face	The transmission of information takes place under general conditions and is available to everyone, it may be written or in the form of a picture or video that is available at any time
Diffusion speed	The spread of information is rather slow	The spread of information is faster through the advantages of its carrier, which is the Internet
Accessibility	less easy	high easy
Message Source	Offline and Physical	More from anonymous sources
Feedbacks	Usually is limited and short lived	Usually is open and more measurable

eWOM in that they can be used in a pull or push-to-buy strategy, i.e., when they are ready or not ready to buy. Also, WOM and eWOM are mostly focused on buying.

3.3   The Stages of eWOM

Three stages are introduced that explain how eWOM works: creation, presentation, and evaluation. The first stage focuses on the creation and design. When creating an eWOM, marketers focus on the title, content, and attachments. The title should reflect the attractiveness of the discussion, and the content should indicate the critical information that customers are interested in, and finally, the accessories and additions of images and videos should reflect what is new in this product. The second stage reflects the presentation. Designing a good eWOM plan will be useless without specifying the appropriate method, place, and time of presentation. The third stage is to determine the impact. The evaluation obtained from customers is what helps marketers to make effective decisions. Through these three stages, customers play a dual role: it is through the feedback and information they provide that an eWOM is created; on the other hand, customers ultimately receive the eWOM content that influences their purchasing decisions. The process seems complicated and has a quick and intertwined interaction, but the success of marketers in creating an eWOM that supports products and brands depends mainly on the extent of success in motivating customers toward those products (Zhang et al. 2020; Shih et al. 2022).

On this basis, customers are inculcated as contributors to, and beneficiaries of, eWOM at the same time. What marketers care about is how eWOM affects the motivations and intentions of customers because it is this that will profitably increase sales for sellers (Mishra and Satish 2016). It is worth noting that at the beginning of the emergence of eWOM, most customers were writing about the products they had consumed for the purpose of truly helping. At the present time, with the development and increase in the popularity of social networking sites such as Facebook, Instagram and WhatsApp, customers are publishing about products just to show off. However, there are professional YouTube channels, for example, that provide real assistance to customers by showcasing products, experiences, strengths, and weaknesses. This is common with channels that talk about mobile phones and their specifications.

3.4   Social Media and Electronic Word of Mouth (eWOM)

Virtual communication is the most distinguishing point for the emergence of the concept of eWOM. The competition in the market between sellers has become heavily supported by social networking sites. However, using social media to market products and services is not without its challenges. According to Wang et al. (2016), postulates that three factors explained by social capital theory (tie strength, shared language,

and trust) and two individual factors explained by self-determination theory (self-disclosure and innovativeness) largely determine the success of eWOM through social communication. Therefore, the use of eWOM on social networking sites is not always successful and depends on a number of factors that determine its effectiveness (Alboqami et al. 2015).

In the same context, eWOM did not appear with the presence of social media, as it existed before that. But eWOM has evolved significantly with the emergence and development of social networks. Social media has increased the circle of anonymous people a customer can talk to. Social communication makes individuals able to communicate with acquaintances and friends or with unknown persons, which affects their buying intentions and decisions (Evans and Erkan 2014). Social media, unlike other platforms, contributes to the interaction of customers with everyone by being familiar. Therefore, the referrals and suggestions that are made directly and indirectly affect the buying intentions of customers (Evans and Erkan 2015). In the end, social networks are in an advanced stage now and have spread greatly. Therefore, marketers must understand the dynamics of the relationship between those networks and eWOM marketing. Sellers who will neglect this aspect will be exposed in one way or another to violent threats from competitors. These threats will be possible even at the level of large companies, because the next generation will be the main engine of the social networking sites.

3.5 Types of Electronic Word of Mouth and Their Impact on Consumer Attitudes

According to Sandes and Urdan (2013), comments, whether positive or negative, affect the brand's image. Thus, eWOM has become an effective tool for Internet marketing. Therefore, marketers seek to expand the use of eWOM to different products and sectors (Hussain et al. 2020). By manipulating cognitive and emotional factors that occur during eWOM on purchasing intentions and decisions (Pourfakhimi et al. 2020), the effect of eWOM on purchase intent can be in two ways. The effect may be through a cognitive or emotional aspect. The cognitive aspect of the situation is how to logically convince the individual of the usefulness of the product. Knowledge eWOM is created by focusing on product benefits, real experiences, or benchmarking against other products. eWOM content and circulation are presented in a calm and streamlined manner that makes the individual aware that it is best for them to purchase the product (Chu et al. 2020).

The emotional aspect of eWOM is represented in its focus on presenting content that affects the customer's emotions through the use of attractive music or colors. Sometimes suggestions are used that manipulate the emotional component of the individual and make him more inclined to engage in purchasing behavior (Pourfakhimi et al. 2020). In any case, the carrier of the information in the eWOM network will transmit that content obtained in the social networking sites. The person who
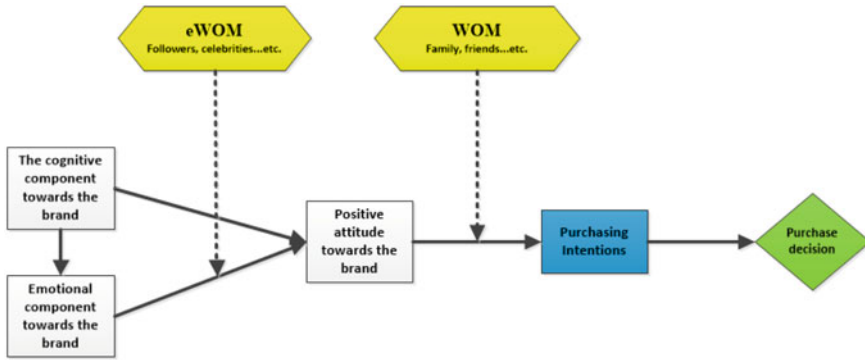
Fig. 4 The role eWOM and WOM in purchase decision

views emotional advertising content will comment on it with emotionally meaningful words (Hussain et al. 2020). In the end, that knowledge and positive emotions are transferred to intentions, and those intentions are in the form of actual behavior. It is worth noting that the formation of purchasing behavior depends not only on the situation formed through eWOM, which is in the form of online communication. Many customers, after their positive attitude about the product and the brand is formed, need an incentive that removes potential anxiety and distrust. Often, WOM is the most appropriate tool for converting attitudes into actual behavior. This process can be explained by Fig. 4.

4 Conclusion

In this chapter, we have discussed three interrelated concepts which are customer intentions, social commerce, and eWOM. We can say that the growth in social commerce is interesting and motivates many studies to increase our understanding of social commerce and its success factors. The main point that social commerce contributes to achieving differently from traditional commerce is quality, which can include cost, time, effort, and speed. Social commerce and through the tools that eWOM achieves for it makes the cost of marketing products low and increases the speed of spread of those products in a short time and little effort. What has been discussed in this chapter as well is that eWOM, which relies on social networks, has a clear benefit in creating positive attitudes toward products. At the same time, transforming this situation may need to engage the customer in the WOM to shift to the intent and purchasing behavior stage.

References

Adhiansyah A, Sudono A, Rizkyanfi MW (2020) The influence of marketing mix on customer purchasing decision at the abraham and smith restaurant. J Gastron Tourism 7(1):46–58

Alboqami H, Al-Karaghouli W, Baeshen Y, Erkan I, Evans C, Ghoneim A (2015) Electronic word of mouth in social media: the common characteristics of retweeted and favourited marketer-generated content posted on Twitter. Inter J Internet Market Advert 9(4):338–358

Alsaggaf MA, Althonayan A (2018) An empirical investigation of customer intentions influenced by service quality using the mediation of emotional and cognitive responses. J Enterp Inf Manag 31(1):194–223

Ardani W, Rahyuda K, Giantari IGAK, Sukaatmadja IPG (2019) Customer satisfaction and behavioral intentions in tourism: A literature review. Int J Applied Busi Int Manag (IJABIM) 4(3):84–93

Attar RW, Shanmugam M, Hajli N (2020) Investigating the antecedents of e-commerce satisfaction in social commerce context. British Food J 123(3):849–868

Cerasoli CP, Nicklin JM, Ford MT (2014) Intrinsic motivation and extrinsic incentives jointly predict performance: a 40-year meta-analysis. Psychol Bull 140(4):980

Chae S, Choi TY, Hur D (2017) Buyer power and supplier relationship commitment: A cognitive evaluation theory perspective. J Supply Chain Manag 53(2):39–60

Chu SC, Kim J, Taylor CR (Eds.) (2020) *Electronic word of mouth as a promotional technique: New insights from social media.* Routledge.

Dadwal SS, Jamal A, Harris T, Brown G, Raudhah S (2020) Technology and sharing economy-based business models for marketing to connected consumers. In *Handbook of research on innovations in technology and marketing for the connected consumer*, pp 62–93. IGI Global.

Deci EL, Ryan RM (2010) Intrinsic motivation. In Weiner B and Craighead WE (eds) The corsini Encyclopedia of Psychology. Hoboken, NJ, John Wiley & Sons.

Dixon-Ogbechi B, Ladipo P (2022) Instant rebate coupon and its influence in online consumer purchase intent among university students in Nigeria. J Soc Sci 2(5):54–71

Dlodlo N, Mahao BB (2020) The influence of demographics on the online purchase decision-making styles of undergraduate students. Int J Busi Manage Stud, 486–500.

Estelami H, O'Connor G (2019) The effects of cognitive style, shopping experience and consumer demographics on consumer reactions to quantity surcharges. J Promot Manag 25(2):161–180

Evans C, Erkan I (2014) The impacts of electronic word of mouth in social media on consumers-spurchase intentions.

Evans C, Erkan I (2015) The influence of electronic word of mouth in social media on consumers' purchase intentions. In *Managing intellectual capital and innovation for sustainable and inclusive society: Managing intellectual capital and innovation; Proceedings of the MakeLearn and TIIM Joint International Conference 2015* (pp. 2007–2007). ToKnowPress.

Filieri R, Lin Z, Pino G, Alguezaui S, Inversini A (2021) The role of visual cues in eWOM on consumers' behavioral intention and decisions. J Bus Res 135:663–675

Friedrich, T. (2015). Analyzing the factors that influence consumers' adoption of social commerce–A literature review.

Friedrich T (2016) On the factors influencing consumers' adoption of social commerce–a review of the empirical literature. Pacific Asia J Assoc Inform Sys 8(4):1–32

Genoveva G, Utami NN (2020) The Influence of Brand Image, Halal Label, and Halal Awareness on Customers Purchasing Decision of Halal Cosmetic. Jurnal Muara Ilmu Ekonomi Dan Bisnis 4(2):355–365

Gevelber L (2015) Why consumer intent is more powerful than demographics. *Think With Google.*

Gunden N, Morosan C, DeFranco A (2020) Consumers' intentions to use online food delivery systems in the USA. Int J Contemp Hosp Manag 32(3):1325–1345

Gutman J (1982) A means-end chain model based on consumer categorization processes. J Mark 46(2):60–72

Hajli N, Sims J, Zadeh AH, Richard MO (2017) A social commerce investigation of the role of trust in a social networking site on purchase intentions. J Bus Res 71:133–141

Holt J, Rumble JN, Telg R, Lamm A (2018) Understanding consumer intent to buy local food: Adding consumer past experience and moral obligation toward buying local blueberries in Florida within the theory of planned behavior. J Appl Commun 102(2):1051–1834

Hu X, Chen X, Davison RM (2019) Social support, source credibility, social influence, and impulsive purchase behavior in social commerce. Int J Electron Commer 23(3):297–327

Huete-Alcocer N (2017) A literature review of word of mouth and electronic word of mouth: Implications for consumer behavior. Front Psychol 8:1256

Hussain S, Song X, Niu B (2020) Consumers' motivational involvement in eWOM for information adoption: The mediating role of organizational motives. Front Psychol 10:3055

Lages LF, Fernandes JC (2005) The SERPVAL scale: A multi-item instrument for measuring service personal values. J Bus Res 58(11):1562–1572

Laoviwat P, Suppapanya P, Yousapronpaiboon K (2014) A study of demographics influencing on consumer behavior and attitude towards brand equity of optical business in Thailand. Int J Trade Econ Financ 5(4):347–350

Lăzăroiu G, Neguriţă O, Grecu I, Grecu G, Mitran PC (2020) Consumers' decision-making process on social commerce platforms: online trust, perceived risk, and purchase intentions. Front Psychol 11:890

Ledikwe A, Stiehler-Mulder B, Roberts-Lombard M (2020) Product involvement, WOM and eWOM in the fast food industry: A young adult perspective in an emerging African economy. Cogent Busi Manag 7(1):1817288

Liang TP, Turban E (2011) Introduction to the special issue social commerce: a research framework for social commerce. Int J Electron Commer 16(2):5–14

Lin H, Zhang M, Gursoy D (2020) Impact of nonverbal customer-to-customer interactions on customer satisfaction and loyalty intentions. Int J Contemp Hosp Manag 32(5):1967–1985

Lin X, Wang X, Hajli N (2019) Building e-commerce satisfaction and boosting sales: The role of social commerce trust and its antecedents. Int J Electron Commer 23(3):328–363

Liu P, Li M, Dai D, Guo L (2021) The effects of social commerce environmental characteristics on customers' purchase intentions: The chain mediating effect of customer-to-customer interaction and customer-perceived value. Electron Commer Res Appl 48:101073

Maia C, Lunardi G, Longaray A, Munhoz P (2018) Factors and characteristics that influence consumers' participation in social commerce. Revista De Gestão 25(2):194–211

Mehrabian A (1976) Questionnaire measures of affiliative tendency and sensitivity to rejection. Psychol Rep 38(1):199–209

Mehrabian A, Russell JA (1974) *An approach to environmental psychology*. The MIT Press.

Mikalef P, Giannakos MN, Pappas IO (2017) Designing social commerce platforms based on consumers' intentions. Behav Inform Technol 36(12):1308–1327

Mishra A, Satish SM (2016) eWOM: Extant research review and future research avenues. Vikalpa 41(3):222–233

Molinillo S, Liébana-Cabanillas F, Anaya-Sánchez R (2018) A social commerce intention model for traditional e-commerce sites. J Theor Appl Electron Commer Res 13(2):80–93

Monfared ARK, Ghaffari M, Barootkoob M, Malmiri MM (2021) The role of social commerce in online purchase intention: mediating role of social interactions, trust, and electronic word of mouth. J Int Bus Entrep Dev 13(1):22–39

Mou J, Benyoucef M (2021) Consumer behavior in social commerce: Results from a meta-analysis. Technol Forecast Soc Chang 167:120734

Nusairat N, Hammouri Q, Al-Ghadir H, Ahmad A, Eid M (2020) The effect of design of restaurant on customer behavioral intentions. Manag Sci Letters 10(9):1929–1938

Porter M (2017) WOM Or eWOM, Is there a difference?: An extension of the social communication theory to consumer purchase related attitudes.

Pourfakhimi S, Duncan T, Coetzee WJ (2020) Electronic word of mouth in tourism and hospitality consumer behaviour: state of the art. Tourism Rev 75(4):637–661

Riyadi A, Rangkuti S (2016, May) The influence of marketing mix and customer purchasing decision process on customer satisfaction. In *Asia Tourism Forum 2016-the 12th Biennial Conference of Hospitality and Tourism Industry in Asia* (pp. 528–534). Atlantis Press.

Sandes FS, Urdan AT (2013) Electronic word-of-mouth impacts on consumer behavior: Exploratory and experimental studies. J Int Consum Mark 25(3):181–197

Schultz CD (2020) Informational, transactional, and navigational need of information: relevance of search intention in search engine advertising. Inform Retrieval J 23(2):117–135

Shen Z (2021) A persuasive eWOM model for increasing consumer engagement on social media: evidence from Irish fashion micro-influencers. J Res Interact Mark 15(2):181–199

Shih CF, Huang SL, Huang HC (2022) The dissemination and impacts of deceptive eWOM: A dynamic process perspective. Behav Inform Technol, 1–25.

Sohn JW, Kim JK (2020) Factors that influence purchase intentions in social commerce. Technol Soc 63:101365

Sun Y, Shao X, Li X, Guo Y, Nie K (2019) How live streaming influences purchase intentions in social commerce: An IT affordance perspective. Electron Commer Res Appl 37:100886

Sweeney JC, Wyber F (2002) The role of cognitions and emotions in the music-approach-avoidance behavior relationship. J Serv Mark 16(1):51–69

Tobon S, García-Madariaga J (2021) The influence of opinion leaders' ewom on online consumer decisions: A study on social influence. J Theor Appl Electron Commer Res 16(4):748–767

Turban E, Strauss J, Lai L (2016) Supporting theories and concepts for social commerce. In Social Commerce. Springer, Cham, pp 47–72.

Verma S, Yadav N (2021) Past, present, and future of electronic word of mouth (EWOM). J Interact Mark 53:111–128

Wang T, Yeh RKJ, Chen C, Tsydypov Z (2016) What drives electronic word-of-mouth on social networking sites? Perspectives of social capital and self-determination. Telematics Inform 33(4):1034–1047

Williams NL, Ferdinand N, Bustard J (2019) From WOM to aWOM–the evolution of unpaid influence: a perspective article. Tourism Review 75(1):314–318

Wu S (2020) Internet public informatioan text data mining and intelligence influence analysis for user intent understanding. J Intell Fuzzy Sys 38(1):487–494

Xu Y, Chen Z, Peng MYP, Anser MK (2020) Enhancing consumer online purchase intention through gamification in China: Perspective of cognitive evaluation theory. Front Psychol 11:581200

Yusuf N, Yunus MAM, Wahid N (2019) A comparative analysis of web search query: informational vs navigational queries. Int. J. Adv. Sci. Eng. Inf. Technol 9(1): 136–141.

Zhang H, Lu Y, Gupta S, Zhao L (2014) What motivates customers to participate in social commerce? The impact of technological environments and virtual customer experiences. Inform Manag 51(8):1017–1030

Zhang H, Yuan X, Song TH (2020) Examining the role of the marketing activity and eWOM in the movie diffusion: The decomposition perspective. Electron Commer Res 20(3):589–608

Zhang KZ, Benyoucef M (2016) Consumer behavior in social commerce: A literature review. Decis Support Syst 86:95–108

Hasan Oudah Abdullah is a lecturer at Basrah University College for Science and Technology in Iraq and a human development coach. He is now a PhD student in business administration at the University of Basrah-Iraq. He is a researcher, who has published research in various journals. He serves as a reviewer for the International Journal of Organizational Analysis and Journal of Health Organization and Management.

Hadi AL-Abrrow is a professor of organization studies at the University of Basrah in Iraq. He earned his doctoral degree in business administration from the University of Essex in the United Kingdom. His research interests include organization studies, organizational behavior, leadership,

and innovation. The author of numerous journal articles, Dr. AL-Abrrow is a reviewer for European Management Review, International Journal of Organizational Analysis, Journal of Management and Health Organization, and Global Business and Organizational Excellence (GBOE).

Nadia A. Atshan is a lecturer at the Southern Technical University, Management Technical College. She received her MBA from the University of Basrah. Her research interests lie in organizational studies.

Sammar Abbas is an Associate professor of organization studies at the Kohat University of Science and Technology in Kohat, Pakistan. He received his doctoral degree in business administration at the University of Essex in the United Kingdom. His research interests center on organizational studies.

Barriers to Using Social Commerce

Abbas Gatea Atiyah and Ruqayah Alaa Zaidan

1 Introduction

With social media becoming platforms for sharing content and communicating with others, organizations can easily search these platforms for marketing opportunities to market their products (Paniagua and Sapena 2014). Guzzo et al. (2016) argued that advanced technologies have made social platforms offer novel marketing prospects that traditional platforms cannot do before. For example, it has been discovered that group-buying can be done online, which is a recent and emerging business opportunity, by relying on the technologies available on social media (Zhang and Gu 2015). Through the interaction between customers and firms of social commerce, the company can display its products and other social actions (Dong and Wu 2015). On the other hand, empirical studies have shown that the financial performance of company is significantly affected by the nature of user-generated content on corporate platforms via social media (Paniagua and Sapena 2014). Besides, Rydén et al. (2015) note that there is a steady increase in the sum of CEOs who see that media can affect the results of companies' business. Therefore, social media has been positively treated by companies, in marketing and promoting new product launches (Rydén et al. 2015; Hajli et al. 2015). The use of social commerce applications has become widely accepted (Kaplan 2012). Much of information needs to be explained and discussed (Lee and Phang 2015). Therefore, Hugh encouraged researchers to study how social media is integrated into different markets and its importance in the emergence of social commerce.

A. G. Atiyah

Faculty of Administration and Economic, University of Thi-Qar, Thi-Qar, Iraq
e-mail: abbas-al-khalidi@utq.edu.iq

R. A. Zaidan (✉)

Department of Information Management, National Yunlin University of Science and Technology, Douliu 64002, Yunlin County, Taiwan, China
e-mail: Ruqayahalaa90@gmail.com

Social commerce allows users to actively participate in the marketing of products in online markets and communities. Online commerce is supported by various social media applications, such as blogs, wikis, and social networks (Kim and Park 2013). Lin and Lu (2015) note the fantastic importance of electronic technologies in making commerce mobile and cross-border. The fast development of Web 2.0 opened up a very leaked probable to convert trade from a production to a customer-centric social situation (Wigand et al. 2008). Social commerce relies on web-based applications built on Web 2.0 (Kaplan and Heinlein 2010). Inside this social environment, customers have entree to information to provide them in achieving an improved understanding of online purchasing and the exact purchasing decisions (Dennison et al. 2009). At the same time, companies using the Internet can learn about customer behaviors and help to grow ideas for effective alternatives (Constantinides and Fountain 2008). Therefore, these mutual advantages have been recognized by many business organizations. Thus social commerce is currently undergoing new development by adopting a variety of features, functions, and capabilities of Web 2.0 to enhance customer engagement (Kim and Srivastava 2007), strengthen customer relationships (Liang et al. 2011), and achieve greater economic value (Parise and Guinan 2008). To this end, this chapter is introduced to discuss the nature of social commerce and barriers to using social commerce.

2 Intentions of Customers

The customer has the intention to purchase the product depending on the perceptions about product and the information of social commerce (Ajzen 1991). When the consumers have little information about the product, they will be reluctant to buy. Frequently, when the consumers have a lot of information about the product or previous experiences, their decision will certainly be logical and timely (Dodds et al. 1991). The customer's intention is often understood as the reason for purchase of a particular product. While the customer's purchase intention is discovered, the company can learn to understand what the customer is trying to reach and what they want to prefer over other products. Therefore, information search is the online shopping procedure (Seock and Norton 2007; Lee and Shin 2014). Several previous studies show that when a customer likes to use new products, they seek information about that product or service through online communication channels. Therefore, customers are influenced by what others say (Laudon and Traver 2009). If their responses are positive, they will give a favorable impression (Bigné-Alcañiz et al. 2008). However, when the review is negative, it will give a negative impression. Much research pays great attention to the analysis of the factors that generate customer purchase intent, for example, the study of Babin et al. (1999) is concerned with analyzing the information generated by the salesperson and how they explain the characteristics and advantages of the product. This study showed that information is a key factor in generating the customer's purchase intention based on the perceptions about the product. Instead, the study of Zheng et al. is concerned with the impact of

consumer interaction and content sharing on purchase intentions. The study shows that there is great importance to the interaction and information transfer by consumers about purchase intentions. The studies of Sharma and Stafford (2000) and Taylor and Baker (1994) are concerned with the social shopping environment. Hu's (2011) study was concerned with the perceived value of a product and how it affects a potential customer's buying intentions. In contrast, Rahman and Soesilo's (2018) study aimed at identifying the risks that the potential customer perceives about the product resulting from consumers' reactions and the content they post about the characteristics of the product. Certainly, some of the concerns cited by researchers and others are the result of the messages people receive daily on social media. These sites have improved access to information quickly and produced a kind of rapid product evaluation based on the information transmitted through social sites. For example, online shopping experiences and ratings, reviews, and recommendations, as well as various content from other customers, lead to the crystallization of purchase intentions (Hu et al. 2016; Zhang et al 2014). Therefore, Friedrich et al. (2016) argue that the density of social commerce features enhances customer connections among themselves and affects the buying intent.

On the other hand, recent studies have seen the adoption of live broadcasting offers by companies as a very important interactive means for achieving effective communication. In this context, the literature has used media richness theory to explain the ability of media used in direct communication to convey real information that is supported by live and direct experience. This theory is concerned with examining and evaluating the level of impact of direct and general communication between individuals and how performance experiments demonstrate the effectiveness of the role through influencing others. Thus, learning skills give impetus to the ability to build perceptions and change convictions for the better. This theory is that action will be better when the processing necessities of the published information match the capacity of the medium used to transmit the information. When this theory is applied in the arena of social commerce, its idea is reflected in creative and communicating customer engagement (Vargo and Lusch 2008). Consequently, the focus is on customer engagement in the condition of interaction and live-to-broadcast platform. This is stimulated by the ability of firms to control the market in a particular product area as a result of building positive customer perceptions. Therefore, various researchers have studied the connection between customer engagement in social media and economic acts (Algharabat and Rana 2021; Hollebeek et al. 2014; de Oliveira et al. 2016), as those studies demonstrated the importance of customer communication in social platforms.

The social network through which companies promote their products expands the circle of discussion between different customers and consumers. It allows companies to understand a customer's buying intentions and their future directions. For companies, these conversations serve as enrichment feedback to help them understand what the customer intends to do in future (Katsikeas et al. 2016). Brodie et al. (2011) concluded customer interaction is the main driver of getting into online shopping environments and brand communities. Because customer engagement is a strategic domineering to generate outstanding corporate act, this performance leads

to continued growth in sales, superior competitive advantage, and profitability. The desire of customers to contribute in the brand communities through social networking sites is nothing but an expression of their readiness to purchase goods or services bearing their optimal brand. In the process of communication, the nature of the connection with the community associated with that brand is evaluated, and this relationship will inspire customers to purchase goods or services related to the brand. There is a positive relationship between the volume of customer interaction and customer purchase intent (Sun et al. 2019).

Goh et al. believe that messages directed to groups interested in a product are more effective than messages directed at a general audience. This point of view determines the strength of interaction between customers who are interested in a particular product, and whose interaction constitutes a process that has a great impact on reaching the required information by identifying experienced customers and trying to reach the smallest details (Tam and Ho 2005). Hence, customers need information tailored to what they want to know. Therefore, Amaldoss and He (2009) see that the directed message is more effective than the undirected message, which is circulated to the audience because directed communication attracts the individual's attention easily and provokes their response. Moreover, compared to undirected communications, consumer-to-customer-oriented communications are likely to obtain standards of mutuality. This focused communiqué might be more explicit about the subjects of the message, such as product characteristics or reaction, which can be switched in a more modified way to suit the preferences or needs of each party.

3 Social Commerce

Dennison and others (2009) defined social commerce as an expression of the common words that individuals use and respond to on websites. While Parise and Guinan (2008) provide a more inclusive definition of social commerce, they consider it a social, collaborative, and creative method used by companies in markets using the Internet. In this definition, Web 2.0 tools align with the new trend of social commerce, which means that consumers post and share content about successful product use. Wigand et al. (2008) focus on the modifications introduced by social commerce, through which social commerce can be described as the application of some electronic technologies in social media interested in the business market, thus transforming the market for products into a community-focused and consumer-led market. To achieve this, social commerce needs many and several specialties, including sociology, psychology, marketing, and computer science.

Concerning the field of marketing, social commerce is defined as a technology used by companies via the Internet by utilizing social media or Web 2.0 as a direct marketing tool to support the decision-making processes of customers (Constantinides and Fountain 2008). Socia and Hootsuite (2020) indicate that consumers are spending more time requisitioning and using social commerce platforms. When consumers visit frequently and apply a lot of period browsing social platforms, the

platform is seen as exhibiting subliminal marketing (Lin et al. 2019; Li et al. 2006). Furthermore, customer volatility occurs in social commerce, when consumers adopt an active attitude to the content and features of products offered through a company's site (Wu et al. 2010). Such as, some customers are becoming eager to collect product and shop through live streaming (Li et al. 2021).

Focusing on computing science, Lee et al. (2008) define social commerce as an online application that combines Web 2.0 skills with interactive platforms (e.g., content communities and social media sites) in a continuous business environment (Wigand et al. 2008). Social networking sites are seen as a technology for displaying social commerce content, using their electronic technologies that facilitate interactions (Fang and Li 2020; Preece 2001). Moreover, electronic technologies through social media provide a wide social space, facilitate the functioning of the social commerce environment, and provide electronic links for the development of social relationships, confidence, social cohesion, and a signal of belonging (Kreijns et al. 2007). Therefore, customers can publish information, post requests as well as seek cooperation with other customers in the social community. Since social commerce networks are powered by social media technologies and closely related to continuous customer interaction, social commerce networks are considered as the essential technologies (Huang and Benyoucef 2017).

In sociology, the focus is on the social influence that leads to interaction in corporate platforms located on social media (Kim and Srivastava 2007). Marsden (2009) discusses social commerce in the psychology of social shopping, and people are influenced by salient information cues from people within a networked community when they shop online. The main advantage of social commerce is to provide a social environment that influences customer preferences, through the transfer of experiences and expertise backed by influential content (live, image, video). Through which the customers convey their experience to the customers (Nicholls and Gad Mohsen 2019), Liu et al. see that there are two types of social interactions represented by controversy and influencing customer decisions. Either this effect results from gaining or sharing link information based on awareness about products, such as customer questions in direct shopping. It may be the result of interaction between people due to close social and human relationships, which leads to participation in dialogs and discussion of hot topics with other customers.

These definitions dealt with the clarification of social commerce from different angles, according to the focus on the axis related to social commerce. This gives a broad understanding to researchers of the scope of social commerce. Also, these definitions give the reader an initial grasp of the distinction between e-commerce and social commerce. Social commerce is the stage of evolution in e-commerce (Kooser 2008; Curty and Zhang 2011; Wang and Zhang 2012). To clarify, social commerce is a major tool in commerce based on modern means of communication, relying on Web 2.0 technologies that support social interaction on electronic platforms and help create useful content. To help consumers make their own decisions and obtain goods and services within online markets and communities, the changes between e-commerce and social commerce lie in three main axes. The first axis includes commercial goals, e-commerce efforts on how to maximize competence,

using complex search strategies, one-click purchasing, and virtual presentation based on the method of description, as well as recommendations generated by consumers' prior shopping behavior (Carroll 2008). While social commerce is directed toward purely social goals, such as information sharing, collaboration, and communication, by focusing on online shopping (Wang and Zhang 2012), the second axis is customer communication. Customers typically interact with e-commerce platforms individually and independently of other customers. While social commerce involves an online interaction process that supports group communication to enhance conversation and dialogs between customers from different locations (Kim and Srivastava 2007), the third axis is system interaction. E-commerce in its traditional form provides one-way browsing, as information from customers is rarely sent to other businesses or customers. But social commerce exaggerated the development of more social and interactive approaches. Several platforms of social commerce allow customers to explicit themselves via their content, and to share their information with other customers and companies (Parise and Guinan 2008).

Social commerce has seen a very high spread through the use of various technologies that have enabled companies to achieve significant growth and expansion in their market share. These platforms include Broadcast and Xiaohongshu as well as the Pinduoduo app. Social commerce plays a successful role in the discovery, discussion, and purchase of appropriate goods and services, thus facilitating the process of obtaining the product. For example, in China the number of consumers using social commerce reached 700 million in 2021 (I-SE Group and CQSER Center 2021). When we compare traditional e-commerce with social commerce, we find that the difference is very clear, as there are important characteristics of social commerce, which is that social commerce is supported by all social media, as well as social commerce offers some new technical features, such as interactivity, stickiness, personalization, and sociability (Li et al. 2019; Phan et al. 2020). Therefore, social commerce platforms have the ability to promote continuous communication between customers and companies. Additionally, between customers and other customers (Sheikh et al. 2019), social commerce provides customers with a seamless way to obtain detailed product information, customized services, and advice that the customer needs. All of these influence customers' intentions and purchasing behavior (Lv et al. 2018; Sun et al. 2019). When customers share their experiences on social media, the process of being evaluated by others begins, the discussion tree grows rapidly, and branches off to lead to spread and engagement by other individuals (Liu et al. 2019). This enhances interaction and cooperation between customers, builds trust in social commerce platforms, helps organize and manage time better, and raises the level of the tangible value of products (Liu et al. 2019; Атия 2016). Therefore, there are a lot of researches that show the impact of social commerce on consumer behavior, purchase intents, and brand presentation. For example, the study by Kim and Park (2013) explored the influence of some characteristics of social commerce (information value, connection, economic benefit, and oral referrals) on customers' confidence and purchasing intentions. The study by Zhang et al. (2014) found that practical context features (aware interaction, personality, and social communication) of social commerce influence the volume of customers' virtual skills and motivate their purchasing intentions. On the

other hand, Gan and Wang (2017) argue that aware value is a compelling necessity for the success of social commerce in a company, and this comes from feedback that expresses the customer's utilitarian values, pleasure, and social support. While Bai et al. (2015) argue that uncertainty about producer and seller influences the buying behavior of consumers in social commerce, some researchers call social commerce sub-factors (customer skills, earlier experience, knowledge, perceived value, social relations, and connections) and claim that these sub-factors play a large role in buying intentions, purchasing behavior, brand spread, and market share increase. These studies show how important social commerce is today. It was observed by Hugh et al. that there are great benefits for companies, for example, the McDonald's restaurant chain provided cash menus to arbitrarily selected customers checked into its openings, and these raise lead up to the making of any content on social platforms, which indirectly helped promotion for its brand.

4   Barriers to Using Social Commerce

Since social commerce expresses a range of activities conducted in a mobile electronic environment through user-generated content (Kucukcay and Benyoucef 2014; Chong et al. 2012), it provides a broad base of feedback on the content being presented and gives the possibility of dialog and exchange of views. Discussions within electronic platforms on various social networking sites are provided by Turban et al. (2010). Social commerce also allows marketers and product promoters to respond to questions across various electronic platforms and supports them with various images, links, and videos (Kim and Park 2013). Lin and Lu (2015) noted there is a significant expansion of these dialogs due to the use of the same platforms from different countries and continents. This has resulted in users becoming concerned about the privacy of their personal information (Zhou 2011). Privacy-conscious users are concerned about their information being collected, stored, and potentially used again by service providers (Zhou and Li 2014). Companies collect massive individual data from their clientele, typically worry about the data provided, and privacy concerns become prominent (Kim and Park 2013; Akhter 2014) and remain a major cause for concern over the issue of the use of social commerce (Dinev and Hart 2006). There are two lines of thought about privacy (Smith et al. 1996). First, it has been hypothesized that privacy concerns consist of four aspects: combination, mistakes, improper entree, and illegal secondary usage. These dimensions have been adopted by many researchers, such as Osatuyi (2015). Dinev and Hart (2004) identify two factors for privacy concerns. Privacy concerns about finding information, and privacy concerns about information misuse. The first indicates users' concern about whether others can easily access their personal information, while the second expresses users' concerns about whether their information will be misused. These factors were later adopted in various studies such as Dinev and Hart (2006), Mohamed and Ahmad (2012), and Zhou and Li (2014). Bansal et al. believe that this may lead to the revelation of subtle information such as banking information and ultimately cause

significant harm. Therefore, it is not surprising that some persons do not wish to reveal such private information when trading online. Furthermore, Dinev and Hart (2006) note that the reluctance to deliver private information (home heading, communication data, and credit card info) in conducting online transactions is consistent with Vroom's (1964) expectation theory, which states that individuals strive to minimize negative outcomes.

On the other hand, customers on social commerce sites have many concerns about innovation in the product offered via electronic platforms, which leads to their distrust of these products and then their resistance to them. It is called innovation resistance, which is classified into two types, namely active and passive (Heidenreich et al. 2016). The first type (active) arises from individuals' resistance to innovation in the product after evaluating the reactions that are presented to the product (Heidenreich and Handrich 2015). The second type (passive) signifies the willingness to fight novelties before they are evaluated. This is mainly attributed to two reasons: users' tendency to resist alteration and to be satisfied with the current situation (Heidenreich and Kraemer 2015). Because innovations usually force changes on users, this may upset the status quo of users and show resistance to the innovation of the second type (passive). Such users who have a high level of passive resistance reject innovation, as they give a negative assessment of innovative products before evaluating them. It must be renowned that passive resistance is a form of comatose confrontation, and remains a neglected area of research, compared to active resistance (Heidenreich and Spieth 2013; Heidenreich et al. 2016; Heidenreich and Handrich 2015; Heidenreich and Kraemer 2015; Talke and Heidenreich 2014).

Therefore, it was decided to focus on the barriers related to active resistance, as they have been widely applied by scholars in the field of social commerce (Chemingui and Lallouna 2013; Laukkanen 2016; Laukkanen and Kiviniemi 2010; Lian and Yen 2013, 2014). These five barriers were suggested by Ram and Sheth (1989), namely usage barriers, value barriers, risk barriers, tradition barriers, and image barriers. Barriers to use and value risk are often mentioned as useful barriers. While both conventional and image fences are identified as psychic barriers (Talke and Heidenreich 2014; Laukkanen 2016), occupational and psychological barriers arise when individuals perceive that features of a product are disruptive or not appropriate to their personal needs and use expectations. Also, the innovation conflicts with consumer social norms, values, or individual usage patterns, if the product is perceived to be too risky to use (Laukkanen et al. 2007; Talke and Heidenreich 2014). Lian and Yen (2013, 2014) describe these barriers as follows:

- **Barriers to use**: When the novelty in the product is not well matched with the customer's requirements and contradicts the customer's habits, traditions, and lifestyle, it constitutes a major obstacle to the use of the innovative product.
- **Value barrier**: When the customer believes that the benefits derived from using the product are less than the additional price paid as a result of innovation in it, the customer sees that there is no desired benefit from the additional price and there is no additional value in the innovative product.

- **Risk Barrier**: The risks come as a result of innovation in the product and the increase in complexity of it. The customer believes that there are new risks in the product and ambiguity in the method of use, and many of them see that these risks are difficult to remove.
- **Traditions barrier**: When innovation in the product leads to a move away from the daily routine of the customers or the mismatch between the social culture and the nature of product use, a new type of barrier is formed for them.
- **Image barrier**: The image barrier is represented by the brand and the country of origin of the product. The development process in it may not meet sufficient satisfaction from the customer, and the customer does not see that there is a sufficient incentive to use the innovative or developed product.

Laukkanen and Kiviniemi (2010) note that these barriers are to some extent related to the technological formulations of the product. The barrier to use corresponds to the comfort of use, perceived complexity, or predictable effort. The value barrier is alike to the perceived comparative advantages of the product, or the nature of the expected performance. The risk barrier is related to the magnitude and type of perceived danger. The tradition barrier is connected to the level of compatibility with tradition. While the image barrier is linked to the importance of perceived concern with the use of the product, therefore, these barriers have been applied in many studies regarding the acceptance of the techniques. Hew et al. (2015) found that consumers are eager to use a mobile application if they perceive that the application is beneficial and simple when used. Conversely, if consumers realize that applications do not provide beneficial value and are hard to use, they will not consider using the application. In the context of social commerce, Guzzo et al. (2016) found that users are concerned about many issues, such as insecure credit card payments, and the perceived danger (danger barrier) is a barrier to accepting online transactions. Moreover, in internet banking, Laukkanen (2016) argued that the risk barrier is lower if users trust the banking organizations they deal with and believe that they are safe in making transactions. This indicates that trust plays a significant role in persuading users to make transactions and be connected (Zhang and Gu 2015). On the other hand, the studies of Brown et al. (2004) and Ding and Chai (2015) determined anxiety is a key component of inhibiting the tendency to engage in social commerce, due to the lack of experience related to computer or mobile phone use. In other words, if users have a bad impression of the mobile app, they are likely to stay away from using the app.

Also, Laukkanen et al. (2007) explored traditional barrier as an important and prominent barrier to social commerce use. As result, customers may view social commerce as a complex, restrictive, and untrustworthy transaction, with some safety and confidentiality risks. Customers may have bad perceptions or imageries of social commerce, which reinforces their resistant conduct. In else study, Chemingui and Lallouna (2013) found that traditional barrier is detrimental to intentions to use social commerce. This indicates that customers are not ready to change their current habits and refuse to use any of the mobile applications. Laukkanen (2016) also emphasized

that barriers of tradition, value, and image are important in the decision to refuse to engage in social commerce.

As explained by Lian and Yen (2013), the tradition and value barriers have harmful effects on the intent to purchase online. Customers are not convinced by the claim that buying items online actually offers more value than buying through physical channels, or that the benefits they get are not enough to motivate them to buy online. Furthermore, customers may refer to trying out the physical products and services offered by employees before making a purchase. However, these experiences and services are impossible in a social trading environment. Consequently, consumers grow resistant to online purchases. Similar findings were confirmed by Lian and Yen (2014). Customers see greater risks in the online shop compared to buying in stores, which may be due to their incapability to entree products through the buying. Considering all the arguments that have been presented, it is certain that the five barriers, in addition to concerns about the privacy of information, are major factors of obstacles to the move toward the use of social commerce.

5 Discussion

Today, companies cannot dispense with social commerce, as it is the most important source for spreading the advantages of companies and the best way for customers to obtain information on the other. Where social commerce is adopted to identify the intentions of customers toward the product and how it can be affected, this matter cannot be abandoned by any researcher. Creating the intention of the customer to try a new product results from the effect of the content he is viewing, which may affect it positively or negatively. In the end, to evaluate the product and indicate the nature of the role it played when used, this is what shows the final behavior of the customers, based on the motives and desires produced by their intentions toward the product. So, there is a significant impact of social commerce through the electronic programs it adopts. For example, Serrano and Torres (2010) examined Web 2.0 techniques and social software for their role in large and middle-sized companies. The study claims that companies can mix a variety of Web 2.0 characteristics into their existing systems, dramatically improving business and social abilities. Therefore, we moved toward detailing the role of social trade and the extent of its impact on the economic and social levels. Costa and Tavares (2011) have pointed out that social commerce is an economic and community business environment that can develop wide spaces for dialog across its numerous social platforms. The results reveal that taking inter-operability social platforms leads to better business collaboration, developing trust and applying strategic styles to strengthen networking in social commerce. However, social commerce is not without obstacles when used, based on perceptions about the validity of the information contained in it or the level of trust in social platforms, for example, the research of Michaelidou et al. (2011) in using obstacles and perceived benefits of social sites in small and medium originalities. They found that obstacles

include the perceived lack of relevance of social sites in the industry and the uncertainty of their usage. Some studies also look at social commerce concerning user behavior, decision-making, and connection-making, such as Wigand et al. (2008) explored customer necessarily for social commerce. They know three basic needs that drive customer behavior via Web 2.0 in the condition of commerce. An additional empirical study submitted by Grange and Benbasat (2010) reports the influence of social commerce on the user's behavioral politics (aware benefit and pleasure). The findings of the study explain that systems like quick access and design of help choices, such as the core message oriented to strong use forecasters of personal belief. This leads to increased brand mindfulness and online communication, in addition to improved customer connection administration. Also, Lee et al. (2008) found that social commerce can greatly raise the competitive advantage of firms. However, this is not without factors that may lead to obstructing the adoption of social commerce, which was discussed above. Accordingly, companies must work on how to get rid of these obstacles and achieve a better social commerce that attracts customers.

6 Conclusion

Social commerce is progressively attracting the care of writers, practitioners, and researchers. Indicates from studies explain that social commerce is a new phenomenon that needs to be better understood as well as describe the relevant features in social commerce design. Because this matter greatly helps companies to adopt the concept of social commerce, today, it has become an indispensable success partner, for both the company and the user alike. For the company, social commerce is an essential element in developing a competitive advantage at the level of planning and marketing. Through the reactions that are presented, companies can feed their future strategic plans toward the scope of the market in which they can operate, how to take advantage of their strengths and employ them correctly, or how to take advantage of the available opportunities and work to make better use of them. As for the customer, social commerce provides a guide in the product selection process, as social media represents an essential element in the exchange of information from various stations and facilitates the process of transmission of visions and perceptions between those interested and looking for the best products. So, companies need to identify the applications and capabilities of social commerce and what social networks are appropriate. Next, they should decide how to develop their social trading strategy. To avoid many of the obstacles to the use of commerce and social commerce, companies need to support the privacy of users, in terms of the information they give to the company, for example, their account numbers and other information, and not to make this information available to everyone so that everyone can view it. Companies should also focus on how to convince the customer that innovation in the product aims to eliminate weaknesses in it, and thus facilitate the process of its use or maintenance or other things.

References

Ajzen I (1991) The theory of planned behavior. Organ Behav Hum Decis Process 50(2):179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Akhter SH (2014) Privacy concern and online transactions: the impact of internet self-efficacy and internet involvement. J Consum Mark 31:118–125

Algharabat RS, Rana NP (2021) Social commerce in emerging markets and its impact on online community engagement. Inform Syst Front 23(6):1499–1520

Amaldoss W, He C (2009) Direct-to-consumer advertising of prescription drugs: a strategic analysis. Marketing Sci 28(3):472–487

Атия АГ (2016) ОРГАНИЗАЦИЯ И УПРАВЛЕНИЕ ВРЕМЕНЕМ. Вестник Московского Автомобильно-Дорожного Государственного Технического Университета (МАДИ) 1:62–67

Babin LA, Babin BJ, Boles JS (1999) The effects of consumer perceptions of the salesperson, product and dealer on purchase intentions. J Retail Consum Serv 6(2):91–97. https://doi.org/10.1016/S0969-6989(98)00004-6

Bai Y, Yao Z, Dou Y-F (2015) Effect of social commerce factors on user purchase behavior: an empirical investigation from renren.com. Int J Inf Manage 35(5):538–550. https://doi.org/10.1016/j.ijinfomgt.2015.04.011

Bigné-Alcañiz E, Ruiz-Mafé C, Aldás-Manzano J, Sanz-Blas S (2008) Influence of online shopping information dependency and innovativeness on internet shopping adoption. Online Inf Rev 32(5):648–667

Brodie RJ, Hollebeek LD, Jurić B, Ilić A (2011) Customer engagement: conceptual domain, fundamental propositions, and implications for research. J Serv Res-US 14(3):252–271

Brown SA, Fuller RM, Vician C (2004) Who's afraid of the virtual world? Anxiety and computer-mediated communication. J Assoc Inf Syst 5:79–107

Carroll B (2008) Social shopping: a new twist on e-commerce. Furnit Today 32(20):81

Chemingui H, Lallouna HB (2013) Resistance, motivations, trust and intention to use mobile financial services. Int J Bank Mark 31:574–592

Chong AYL, Chan FTS, Ooi KB (2012) Predicting consumer decisions to adopt mobile commerce: cross country empirical examination between China and Malaysia. Decis Support Syst 53:34–43

Constantinides E, Fountain SJ (2008) Web 2.0: conceptual foundations and marketing issues. J Direct Data Digit Mark Pract 9(3):231–244

Costa AA, Tavares LV (2011) Social e-business and the Satellite Network model: innovative concepts to improve collaboration in construction. Autom Constr 22:387–397

Curty RG, Zhang P (2011) Social commerce: looking back and forward. Proc Am Soc Inf Sci Technol 48(1):1–10

Dennison G, Bourdage-Braun S, Chetuparambil M (2009) Social commerce defined. White paper #23747, IBM Corporation, Research Triangle Park, NC, November

de Oliveira MJ, Huertas MKZ, Lin Z (2016) Factors driving young users' engagement with Facebook: evidence from Brazil. Comput Hum Behav 54:54–61

Dinev T, Hart P (2004) Internet privacy concerns and their antecedents—measurement validity and a regression model. Behav Inform Technol 23:413–422

Dinev T, Hart P (2006) An extended privacy calculus model for e-commerce transactions. Inf Syst Res 17:61–80

Ding Y, Chai KH (2015) Emotions and continued usage of mobile applications. Ind Manag Data Syst 115:833–852

Dodds WB, Monroe KB, Grewal D (1991) Effects of Price, brand, and store information on buyers' product evaluations. J Mark Res 28(3):307–319. https://doi.org/10.1177/002224379102800305

Dong JQ, Wu W (2015) Business value of social media technologies: evidence from online user innovation communities. J Strateg Inf Syst 24:113–127

Fang Y-H, Li C-Y (2020) Leveraging sociability for trust building on social commerce sites. Electron Commer Res Appl 40:100907. https://doi.org/10.1016/j.elerap.2019.100907

Friedrich T, Overhage S, Schlauderer S (2016) The more the better? Exploring the relationship between social commerce feature intensity, social factors, and consumers' buying behavior. Paper presented at the International Conference on Information Systems

Gan C, Wang W (2017) The influence of perceived value on purchase intention in social commerce context. Internet Res 27(4):772–785. https://doi.org/10.1108/IntR-06-2016-0164

Grange C, Benbasat I (2010) Online social shopping: the functions and symbols of design artifacts. In: Sprague R (ed.), Proceedings Of the 43rd Hawaii international conference on system sciences, Kauai, HI. IEEE Computer Society Press, Washington, DC, January 2010, pp 1–10

Guzzo T, Ferri F, Grifoni P (2016) A model of e-commerce adoption (MOCA): consumer's perceptions and behaviours. Behav Inform Technol 3001:1–14

Hajli N, Shanmugam M, Powell P, Love PED (2015) A study on the continuance participation in on-line communities with social commerce perspective. Tech Forcasting Soc Chang 96:232–241

Heidenreich S, Handrich M (2015) What about passive innovation resistance? Investigating adoption-related behavior from a resistance perspective. J Prod Innov Manag 32:878–903

Heidenreich S, Kraemer T (2015) Passive innovation resistance: the curse of innovation? Investigating consequences for innovative consumer behavior. J Econ Psychol 51:134–151

Heidenreich S, Kraemer T, Handrich M (2016) Satisfied and unwilling: exploring cognitive and situational resistance to innovations. J Bus Res 69:2440–2447

Heidenreich S, Spieth P (2013) Why innovations fail—the case of passive and active innovation resistance. Int J Innov Manag 17 (1350021-1-1350021–42)

Hew JJ, Lee VH, Ooi KB, Wei J (2015) What catalyses mobile apps usage intention: an empirical analysis. Ind Manag Data Syst 115:1269–1291

Hollebeek LD, Glynn MS, Brodie RJ (2014) Consumer brand engagement in social media: conceptualization, scale development and validation. J Interact Market 28(2):149–165

Hu X, Huang Q, Zhong X, Davison RM, Zhao D (2016) The influence of peer characteristics and technical features of a social shopping website on a consumer's purchase intention. Int J Inf Manag 36(6, Part B):1218–1230. https://doi.org/10.1016/j.ijinfomgt.2016.08.005

Hu Y (2011) Linking perceived value, customer satisfaction, and purchase intention in e-commerce settings. Adv Intell Soft Comput 106:623–628. https://doi.org/10.1007/978-3-642-23753-9_100

Huang Z, Benyoucef M (2017) The effects of social commerce design on consumer purchase decision-making: an empirical study. Electron Commer Res Appl 25:40–58. https://doi.org/10.1016/j.elerap.2017.08.003

I-SE Group and CQSER Center (2021) Social e-commerce in China 2021 industry development report: research on key enterprises. Retrieved from http://www.ec100.cn/detail-6586846.html

Kaplan AM (2012) If you love something, let it go mobile: mobile marketing and mobile social media 4×4. Bus Horiz 55:129–139

Kaplan AM, Haenlein M (2010) Users of the world, unite! The challenges and opportunities of social media. Bus Horiz 53(1):59–68

Katsikeas CS, Morgan NA, Leonidou LC, Hult GTM (2016) Assessing performance outcomes in marketing. J Market 80(2):1–20

Kim S, Park H (2013) Effects of various characteristics of social commerce (s-commerce) on consumers' trust and trust performance. Int J Inf Manag 33:318–332

Kim YA, Srivastava J (2007) Impact of social influence in e-commerce decision making. In: Proceedings of the Ninth International Conference on Electronic Commerce, Minneapolis, MN. ACM Press, New York, NY, August 2007, pp 293–302

Kooser AC (2008) Social shopping. Entrep 36(7):112–113

Kreijns K, Kirschner PA, Jochems W, van Buuren H (2007) Measuring perceived sociability of computer-supported collaborative learning environments. Comput Educ 49(2):176–192. https://doi.org/10.1016/j.compedu.2005.05.004

Kucukcay IE, Benyoucef M (2014) Mobile social commerce implementation. In: 6th International Conference on Management of Emergent Digital EcoSystems. Association for Computing Machinery, pp 1–8

Laudon KC, Traver CG (2009) *E-commerce: business. Technology. Society*, 5th edn. Prentice Hall, Hoboken NJ

Laukkanen T (2016) Consumer adoption versus rejection decisions in seemingly similar service innovations: the case of the internet and mobile banking. J Bus Res 69:2432–2439

Laukkanen T, Kiviniemi V (2010) The role of information in mobile banking resistance. Int J Bank Mark 28:372–388

Laukkanen T, Sinkkonen S, Kivijärvi M, Laukkanen P (2007) Innovation resistance among mature consumers. J Consum Mark 24:419–427

Lee E, Shin, SY (2014) When do consumers buy online product reviews? Effects of review quality, product type, and reviewer's photo. Comput Hum Behav 31(1):356–366

Lee SH, DeWester D, Park SR (2008) Web 2.0 and opportunities for small business. Serv Bus 2(4):335–345

Lee SYT, Phang CW (2015) Leveraging social media for electronic commerce in Asia: research areas and opportunities. Electron Commer Res Appl 14:145–149

Li D, Browne GJ, Wetherbe JC (2006) Why do Internet users stick with a specific web site? A relationship perspective. Int J Electron Commer 10(4):105–141. https://doi.org/10.2753/jec1086-4415100404

Li Y, Li X, Cai J (2021) How attachment affects user stickiness on live streaming platforms: a socio-technical approach perspective. J Retail Consum Serv 60:102478. https://doi.org/10.1016/j.jretconser.2021.102478

Li Y, Yang K, Chen J, Gupta S, Ning F (2019) Can an apology change after-crisis user attitude? The role of social media in online crisis management. Inf Technol People 32(4):802–827. https://doi.org/10.1108/ITP-03-2017-0103

Lian J-W, Yen DC (2013) To buy or not to buy experience goods online: perspective of innovation adoption barriers. Comput Hum Behav 29:665–672

Lian J-W, Yen DC (2014) Online shopping drivers and barriers for older adults: age and gender differences. Comput Hum Behav 37:133–143

Liang T, Ho Y, Li Y, Turban E (2011) What drives social commerce: the role of social support and relationship quality. Int J Electron Commer 16(2):69–90

Lin J, Luo Z, Cheng X, Li L (2019) Understanding the interplay of social commerce affordances and swift guanxi: an empirical study. Inf Manag 56(2):213–224. https://doi.org/10.1016/j.im.2018.05.009

Lin KY, Lu HP (2015) Predicting mobile social network acceptance based on mobile value and social influence. Internet Res 25:107–130

Liu C, Bao Z, Zheng C (2019) Exploring consumers' purchase intention in social commerce. Asia Pac J Mark Logist 31(2):378–397. https://doi.org/10.1108/APJML-05-2018-0170

Lv Z, Jin Y, Huang J (2018) How do sellers use live chat to influence consumer purchase decision in China? Electron Commer Res Appl 28:102–113. https://doi.org/10.1016/j.elerap.2018.01.003

Marsden P (2009) How social commerce works: the social psychology of social shopping. Social Commerce Today, Syzygy London, London, UK. Retrieved from https://socialcommercetoday.com/how-social-commerce-works-thesocial-psychology-of-social-shopping

Michaelidou N, Siamagka NT, Christodoulides G (2011) Usage, barriers and measurement of social media marketing: an exploratory investigation of small and medium B2B brands. Ind Mark Manage 40(7):1153–1159

Mohamed N, Ahmad IH (2012) Information privacy concerns, antecedents and privacy measure use in social networking sites: evidence from Malaysia. Comput Hum Behav 28:2366–2375

Nicholls R, Gad Mohsen M (2019) Managing customer-to-customer interaction (CCI)—insights from the frontline. J Serv Mark 33(7):798–814. https://doi.org/10.1108/JSM-11-2018-0329

Osatuyi B (2015) Is lurking an anxiety-masking strategy on social media sites? The effects of lurking and computer anxiety on explaining information privacy concern on social media platforms. Comput Hum Behav 49:324–332

Paniagua J, Sapena J (2014) Business performance and social media: love or hate? Bus Horiz 57:719–728

Parise S, Guinan PJ (2008) Marketing using Web 2.0. In: Sprague R (ed) Proceedings of the 41st Hawaii International conference on system sciences, Hawaii, HI. IEEE Computer Society Press, Washington, DC, January 2008

Phan Q, Ngo V, Phuoc N (2020) How social commerce characteristics influence consumers' online impulsive buying behavior in emerging markets. Int J E-Bus Res 16:74–88. https://doi.org/10.4018/IJEBR.2020070105

Preece J (2001) Sociability and usability in online communities: determining and measuring success. Behav Inf Technol 20(5):347–356. https://doi.org/10.1080/01449290110084683

Rahman F, Soesilo PKM (2018) The effect of information exposure of contract manufacturing practice on consumers' perceived risk, perceived quality, and intention to purchase private label brand. J Retail Consum Serv 42:37–46. https://doi.org/10.1016/j.jretconser.2018.01.010

Ram S, Sheth JN (1989) Consumer resistance to innovations: the marketing problem and its solutions. J Consum Mark 6:5–14

Rydén P, Ringberg T, Wilke R (2015) How managers' shared mental models of business–customer interactions create different sensemaking of social media. J Interact Mark 31:1–16

Seock YK, Norton M (2007) Attitude toward internet web sites, online information search, and channel choices for purchasing. J Fash Mark Manag 11(4):571–586

Serrano N, Torres JM (2010) Web 2.0 for practitioners. IEEE Softw 27(3):11–15

Sharma A, Stafford TF (2000) The effect of retail atmospherics on customers' perceptions of sales-people and customer persuasion: an empirical investigation. J Bus Res 49(2):183–191. https://doi.org/10.1016/S0148-2963(99)00004-1

Sheikh Z, Yezheng L, Islam T, Hameed Z, Khan IU (2019) Impact of social commerce constructs and social support on social commerce intentions. Inf Technol People 32(1):68–93. https://doi.org/10.1108/ITP-04-2018-0195

Smith HJ, Milberg SJ, Burke SJ (1996) Information privacy: measuring individuals' concerns about organizational practices. MIS Q 20:167–196

Sun Y, Shao X, Li X, Guo Y, Nie K (2019) How live streaming influences purchase intentions in social commerce: an it affordance perspective. Electron Commer Res Appl 37:100886. https://doi.org/10.1016/j.elerap.2019.100886

Talke K, Heidenreich S (2014) How to overcome pro-change bias: incorporating passive and active innovation resistance in innovation decision models. J Prod Innov Manag 31:894–907

Tam KY, Ho SY (2005) Web personalization as a persuasion strategy: an elaboration likelihood model perspective. Inform Systems Res 16(3):271–291

Taylor SA, Baker TL (1994) An assessment of the relationship between service quality and customer satisfaction in the formation of consumers' purchase intentions. J Retail 70(2):163–178. https://doi.org/10.1016/0022-4359(94)90013-2

Turban E, Bolloju N, Liang T-P (2010) Social commerce. In: 12th International Conference on Electronic Commerce Roadmap for the Future of Electronic Business—ICEC '10. Association for Computing Machinery

Vargo SL, Lusch RF (2008) Service-dominant logic: continuing the evolution. J Acad Market Sci 36(1):1–10

Vroom VH (1964) Work and motivation. Wiley, New York

Wang CN, Zhang P (2012) The evolution of social commerce: the people, management, technology, and information dimensions. Commun Assoc Inf Syst 31:1–23

We Are Social and Hootsuite (2020) *Digital 2020 July Global Statshot report*. https://datareportal.com/reports/digital-2020-july-global-statshot?rq=Digital%202020%20July%20Global%20Statshot%20report

Wigand RT, Benjamin RI, Birkland J (2008) Web 2.0 and beyond: implications for electronic commerce. In: Proceedings of the 10th International Conference on Electronic Commerce, Innsbruck, Austria. ACMPress, New York, NY, August 2008

Wu J-J, Chen Y-H, Chung Y-S (2010) Trust factors influencing virtual community members: a study of transaction communities. J Bus Res 63(9):1025–1032. https://doi.org/10.1016/j.jbusres.2009.03.022

Zhang H, Lu Y, Gupta S, Zhao L (2014) What motivates customers to participate in social commerce? The impact of technological environments and virtual customer experiences. Inf Manag 51(8):1017–1030. https://doi.org/10.1016/j.im.2014.07.005

Zhang Z, Gu C (2015) Effects of consumer social interaction on trust in online group-buying contexts: an empirical study in China. J Electron Commer Res 16:1–21

Zhou T (2011) The effect of flow experience on user adoption of mobile TV. Behav Inform Technol 111:1–10

Zhou T, Li H (2014) Understanding mobile SNS continuance usage in China from the perspectives of social influence and privacy concern. Comput Hum Behav 37:283–289

Dr. Abbas Gatea Atiyah is a Senior Lecturer in the Faculty of Administration and Economics, University of Thi-Qar, Thi-Qar, Iraq. He has published many articles in prestige journals. He serves as a reviewer in many journals. He can be reached at abbas-al-khalidi@utq.edu.iq.

Dr. Ruqayah Alaa Zaidan is a PhD student at the Department of information management, National Yunlin University of Science and Technology, Douliu City, 64002 Yunlin County, Taiwan. She has published many articles in prestige journals. She serves as a reviewer in many journals. She can be reached at Ruqayahalaa90@gmail.com.

The Role of BlockChain Adoption and Supply Chain Practices on Social Commerce

Krar Muhsin Thajil, Hadi AL-Abrrow, and Hasan Oudah Abdullah

1 Introduction

Social commerce is a reflection or the other face of electronic commerce, as the idea of social commerce includes commercial operations, exchange of goods and services, and their transfer between the two parties of the seller and the buyer through reliance on Internet networks (Abdullah et al. 2022; Alnoor et al. 2022; Beyari and Abareshi 2019). Many organizations nowadays are interested in the business process system, which revolves around the two ends of this system, the input and the output. As the processes of transforming the basic raw materials of production and its components (inputs) into products from finished goods and services (outputs). Attention to the transfer of those outputs from the place of production to the place of consumption. This is seen as interest in supply chain operations that work to achieve those requirements for organizations in general (Sharma et al. 2020; Houlihan 1985). In a way, this interest has become a preoccupation for these organizations due to its role and importance in pushing the organizations' performance forward in the field of achieving profits, reducing costs, and superiority over competitors (Kopyto et al. 2020; Stadtler 2008). However, these operations cannot be accessed and achieved simply, as are many of the systems and commercial operations that are hardly devoid of complex problems that easily impede the functioning of their operations (Cox 1999; Ivanov et al. 2022). These problems lie in achieving the main purpose of the

K. M. Thajil
Department of Business Administration, Mazaya University, Nasiriyah, Iraq

H. AL-Abrrow (✉)
Department of Business Administration, College of Administration and Economic, University of Basrah, Basrah, Iraq
e-mail: hauni_2000@yahoo.com

H. O. Abdullah
Department of Business Administration, Basra University College of Science and Technology, Basrah, Iraq

supply chain, which addresses the problem of lack of information related to products and their processes of transformation and transfer to the consumer, as well as addressing obtaining that information in a timely manner without any delay (Lambert and Cooper 2000; Raja Santhi and Muthuswamy 2022). Given the repetition of those processes and the accumulation of information that must be available to organizations by working in the supply chain, the problem of dealing with rather huge volumes of information appears (Min and Zhou 2002). Which is directly related to the increasing fears of those organizations from the operations of breaching the security of that information (Ellram et al. 2004; Cohen and Roussel 2022). Thus, fraud or manipulation of information occurs. Because of the large number of parties that deal, influence, and are affected by supply chain operations, the level of transparency and clarity begins to diminish gradually (Hanaysha and Alzoubi 2022; Croxton et al. 2001). In order to address this problem related to information security, it was proposed to work with blockchain technology and integrate it as an integral part of the supply chain systems (Kshetri 2017; Anderson et al. 2007). Due to the characteristics of the blockchain technology in terms of providing transparency as much as possible and maintaining the stability and stability of operations without obstructing and supporting the distribution currencies well (Wang et al. 2018b; Foster and Ganguly 2007).

2 What Blockchain Is?

The combined data set constitutes the basic nucleus of the blockchain, which in turn consists of a set of blocks of data and each block includes several transactions, and a special value for each block referred to as the hash values of the blocks, which are unique (Nofer et al. 2017) and hence represent a kind of encryption in a way that works to protect against fraud due to the degree of sensitivity to those values when trying to change any transaction (Zheng et al. 2018). The integrity of these blocks is usually verified by relying on encryption tools (Swanson 2015), which is usually done by accepting the bulk of data packets and transactions for them as a condition and a basic criterion for judging the integrity and validity of the blocks and thus adding those blocks to a connected chain (Glaser 2017; Catalini and Gans 2020).

The concept of compatibility of those packets refers to the situation in which most network auditors agree on the situation in which the blocks are used (Ahram et al. 2017). As the blockchain is a set of procedures and rules that work to maintain the coherence of a set of facts within the various participating packages (Bodkhe et al. 2020). It is precisely for this reason that new additional transactions cannot be automatically added to the blockchain in the working state, and for the adapter to address this problem is the process of including these new transactions in a temporary storage form inside the blocks (Bodkhe and Tanwar 2020). In the end, the transactions are well protected. So, no changes or modifications can be made to the information within the blockchain (Mistry et al. 2020).

3 The Main Components of Blockchain

Blockchain technology consists of several components that are essential in building this technology, which are the asymmetric encryption key, transactions, and finally the consensus mechanism between the nodes (Puthal et al. 2018). The nature of the work of the asymmetric encryption key component is demonstrated through the adoption of the blockchain technology to protect the exchange of data and preserve it from intruders (Li et al. 2017). For example, instead of the presence of data users in the same platform, these users need digital accounts that are as secure as possible from strangers' access to those accounts, especially in the areas of money management for individuals or companies (Zheng et al. 2017). Those accounts are secured with a special secret key that works to protect those accounts, and it is preferable to change it from time to time to protect the privacy of the user (Mohan 2018).

In addition to protecting the exchange of data for users, the blockchain technology provides a service for sharing that data and information between the nodes that make up the system (Dinh et al. 2017). It is exchanged easily through the presence of some nodes that represent the role of the main source of information to the rest of the nodes throughout the network for the purpose of knowing the accuracy and validity of that data through analysis by all other nodes (Nofer et al. 2017). These operations are clearly carried out through the transactions of the second component of the blockchain technology, after which these transactions are collected in the form of blocks (Lopes and Alexandre 2018).

Finally comes the role of the consensus mechanism or consensus between the nodes, as it is one of the most important characteristics and advantages of the blockchain technology is the lack of centralization in the work of the constituent nodes (Abdellatif and Brousmiche 2018). Thus, there is a clear lack of a party working to solve the problems that may face this technology resulting from inconsistency or contradiction of the orders of each node of these contracts (Pradeepkumar et al. 2018; Wang et al. 2020). In addition to protecting the existing data from breach and the ability to provide sufficient security for the exchange of data out of the reach of intruders (Curchoe 2022). This requires the need for alternatives that address those existing gaps, which were the outdated consensus. The consensus mechanism works on the agreement of all contracts through common standards between them and maintains sufficient coordination for the success of its work. Therefore, that data from several are not accepted without the approval of the majority (Vishwa and Hussain 2018; Zheng 2021; Dasaklis et al. 2019). The components of the blockchain technology can be illustrated by Fig. 1.

Ledger:	Provides current global standards for how transactions are conducted in blockchain technology.
Smart contract:	Encrypts transactions with secret codes.
Consensus network:	A group of parties and participants in the use of blockchain technology, and they save and use data.
Membership:	Working to manage the access to data through the participants.
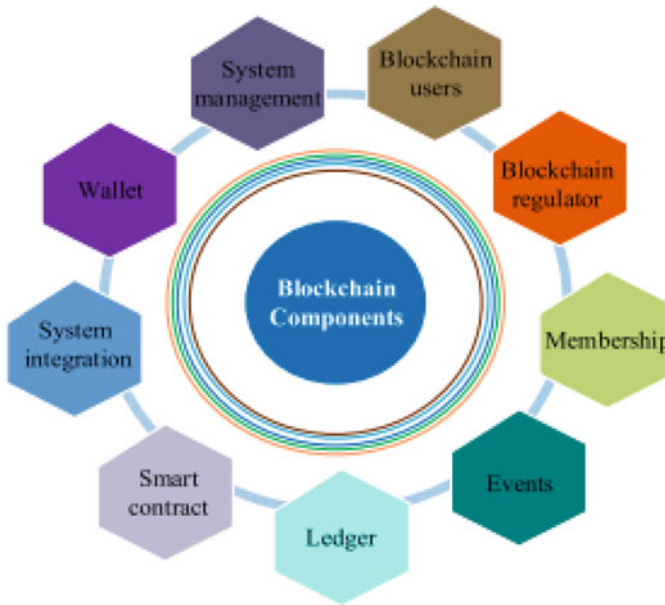
Fig. 1 Components of the blockchain

Events:	Show notifications related to the creation of new blocks and transactions.
System administration:	concerned with creating and modifying blockchain blocks and exercising control over them.
Wallet:	Pay attention to the security of transactions.
System integration:	Integrating the blockchain in such a way that the blockchain technology influences and influencing other systems.

4 Applications of Blockchain

Blockchain applications are very broad and there are many different types of applications, for example, blockchain is applied in end-user applications, server-based applications, and supply chain and web applications (Bodkhe et al. 2020). Where the blog users perform a variety of roles, sometimes their role is as auditors, and sometimes as operators, administrators, or business users. In general, blockchain applications rely on application programming interfaces as an important means to obtain a set of services such as databases, as well as to publish those services (Bhattacharya et al. 2019). It is possible to support and enhance various and multiple applications through these services of the blockchain, for example, applications in business, accounting, finance, health care, insurance, supply chain, and areas interested in energy, which

leads to the achievement of benefits for organizations by reducing effort, time, and costs (Vora et al. 2018a; Fraga-Lamas and Fernandez-Carames 2019).

Blockchain can provide great help and support to users and developers alike through the application programming interface, allowing them to be able to easily repeat the use of data as well as repeat the use of information in proportion to their services, as the block works to provide multiple interfaces of application programming that can greatly support business operations (Johng et al. 2018; Khan and Salah 2018; Bhattacharya et al. 2019). On the other hand, the blockchain is the most important applications. Due to such a technique support smart health care, which represents a qualitative shift in the field of data storage from the traditional method. Hence, it is characterized by storing data related to patients in a way that tends to be centralized organization. Furthermore, this data cannot be accessed from anyone for protecting patient privacy and maintaining data security for fear of intruders (Wang et al. 2018a; Vora et al. 2018a).

In order to address those problems that make traditional health care not meet all the requirements for successful and efficient performance (Yaga et al. 2019). The blockchain has been inserted into the healthcare system under the title of smart health care, which is based on the implementation of its procedures and practices through smart tools in storing and transferring data and following up on different patient cases remotely (Jhala et al. 2018; Bodkhe et al. 2020) wired through wearable gadgets (Vora et al. 2018b; Catalini and Gans 2020). The smart healthcare use of the blockchain technology can be illustrated through Fig. 2.
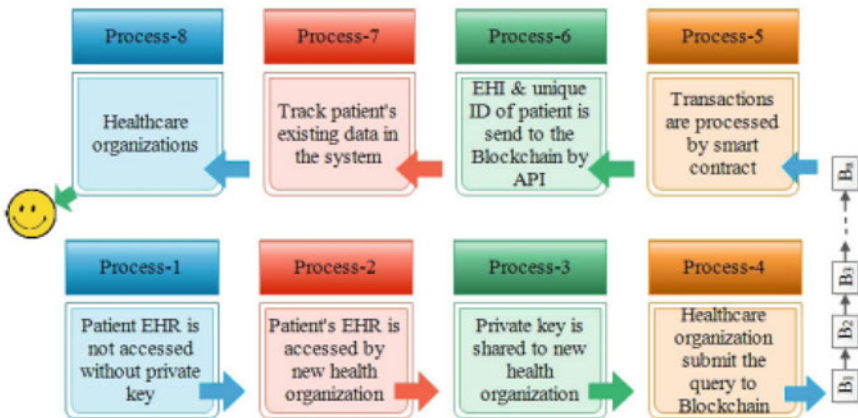
Fig. 2 Blockchain in smart health care (Bodkhe et al. 2020)

5   Blockchain Modules

Blockchain comes in many models, but one of the fundamental aspects with blockchain is that there is always a network of nodes (computers/actors) participating in the network mainly. There are two models of blockchain technology, private and public blockchains (Lizcano et al. 2020). However, based on some other criteria and analysis, blockchain technology can also be described as consortium which means constructed by a group of people, in addition to the hybrid blockchain technology (Wang et al. 2016). In blockchain, the network of nodes is also described as peer-to-peer system (Yue et al. 2021).

"A Peer-to-peer systems are distributed software systems that consists of nodes (individual computers), which make their computational resources directly available to another" (Drescher 2017, p. 33). The benefit of a peer-to-peer system grants users to interact with each other directly. Peer-to-peer system replaces the intermediate, lower the cost and increase the speed of the system. The participants can interact with each other without having central coordination. The relation between a peer-to-peer system and blockchain is that the system uses blockchain as a tool to achieve and maintain integrity (Drescher 2017).

Hybrid blockchain deals with centralized and decentralized systems and it is not open; however, it has the features of integrity, transparency, as well as security (Sagirlar et al. 2018). It has several advantages over traditional blockchains. In hybrid blockchains, maximum customization is being considered as main benefits with private permission-based system as well as a public permission-less system. In this type of blockchain systems, users are able in getting access and selected sections and rest can be recorded or keeps safe due to the benefits of the records from the ledger (Zhu et al. 2019). Hybrid blockchains is flexible that users can join easily as private blockchain. This type of blockchain is able in enhancing the security and transparency of the blockchain network (Omar et al. 2021).

Hybrid Blockchains is a merger of public blockchain as well as private blockchain and it is required in better control for achieving higher goals. Hybrid blockchain deals with centralized and decentralized systems and it is not open; however, it has the features of integrity, transparency, as well as security (Sagirlar et al. 2018). It has several advantages over traditional blockchains. In Hybrid Blockchains, maximum customization is being considered as main benefits with private permission-based system as well as a public permission-less system. In this type of blockchain systems, users are able in getting access and selected sections and rest can be recorded or keeps safe due to the benefits of the records from the ledger (Zhu et al. 2019). Hybrid Blockchains is flexible enough so that users can join easily as private blockchain. This type of blockchain is able in enhancing the security and transparency of the blockchain network (Omar et al. 2021).

A consortium blockchain provides a middle ground between the low trust provided by the public blockchain and the 'single entity that rules everything' of the private blockchain (Mingxiao et al. 2017). In this type of blockchain, instead of allowing any person with an Internet connection to participate in the transaction process or only

allow a single organization to have full control over what is done in the network, a few selected nodes are predetermined, and they control the network (Calvaresi et al. 2018). Only this group of pre-selected nodes can participate in the consensus process, and since is formed by several organizations, the participants have the power to grant write/read permissions to other participants and only a small portion of the nodes in the network would be selected to determine the consensus, making this type of blockchain partially decentralized (Zheng et al. 2017). Consortium blockchains are also very efficient, since there are few participants validating the transactions (Wust and Gervais 2018). As private blockchains, the limited number of participants makes it easier to tamper the blockchain (Zheng et al. 2017).

6 The Concept of Supply Chain

The supply chain is the alignment of firms that move goods or services to market (Ivanov et al. 2022). Since the beginning of the twentieth century, economists have considered the activities associated with the effective management of the critical automated business channels through which goods and services are exchanged through economic systems (Raja Santhi and Muthuswamy 2022; Zilberman et al. 2022). For example, in business, the channel management function is of tactical importance only, due to the reason for the narrow scope and lack of integration between the nodes of the supply network (Moosavi et al. 2022; Cohen and Roussel 2022). However, the importance of the supply chain has begun to take on a wider range in terms of its importance, as it is described as a series of systems and methods to meet demand consisting of several stages starting from the source of supply to the point of consumption and aims to supply, remove, and recycle organizational activities. This requires analyzing several different aspects, which are the quantities, qualities, prices, locations of delivery, storage, and transportation history correctly (Soni et al. 2022; Zhang et al. 2022).

Supply chain management is seen as an integration of a group of major business processes, which includes the provision of a set of information, services, and products to customers by a group of suppliers in a way that makes the customer and all and all parties involved in the business processes within it get the added value (Kim 2003; Hanaysha and Alzoubi 2022). Since the supply chain consists of a set of stages that act directly or indirectly in satisfying the needs of customers, it can be said that the supply chain includes not only the manufacturer and suppliers, but also carriers, warehouses, retailers, and customers themselves (Sunil and Meindl 2001; Shamout et al. 2022). As organizations move aggressively to improve their supply chain management by balancing the increasing demands of customers and the need for profitability growth by treating supply chain management as a strategic variable, I have realized the urgent need to learn about the two important issues of knowing the supply chain comprehensively and the links associated with managing the flow of products, services, and information from suppliers to customers (Crandall et al. 2015; Lee et al. 2022). Over the past 30 years, the concept of supply chain management has

been explored by various researchers and practitioners. In Table 1, we synthesized the conceptual evolution regarding supply chain management through several definitions and concepts of supply chain management from its introduction until today.

7 Software and Supply Chain

Software is often integrated into information systems in a way that creates a set of integrated programs that allow the ability to collect information and carry out the process of storing that information and data, processing the latter and transferring it completely (Herr 2021). The accuracy and correctness of the work of information systems programming are verified by setting an important basic criterion that is evident through some simple methods (Angolia and Pagliari 2018), which include placing a set of questions about the ability of information systems programming in a way that makes it supportive and enhancing in the conduct of supply chain operations in a better way as well as supporting and enhancing some businesses management related to enhancing manufacturing processes efficiently and enhancing compliance (Carmody et al. 2021). Fulfilling demand in a timely manner, managing demand-related processes, managing the distribution of products and services, as well as analyzing a very large set of data related to business processes and enhancing the supply processes based on efficiency and effectiveness (Elgendy 2021; Zhang et al. 2019).

There are some procedures and tools used related to information systems that are considered the common link between information systems programming and an effective supply chain, which works to clarify the relationship of information systems programming to the supply chain (Eggers 2021; Katoch 2022). Its importance in enhancing its efficient management. For example, the ability to analyze large amounts of data is one of the most important tools and organizational procedures and the main entrance to it to support the organization with the ability to possess the required information (Harrand et al. 2021; Helo and Hao 2019). Using these tools and procedures in an integrated manner, in order to benefit from them in the processes of forecasting the potential outcomes of production systems or the decisions taken to develop appropriate solutions to the problems facing the organization in any other field (Baydoun and Ahmad 2022; Sulaeman and Harsono 2021).

Despite those advantages available from the relationship of application programming or programming information systems in the supply chain, there are many concerns that have aroused the interest of business organizations resulting from those systems and the relationships among them, which were mainly focused on the privacy and security of that information that is stored and transmitted (Cox 2019; Vu et al. 2020). As the work of information package managers in programming information systems and supply chain includes obtaining information from outside and entering it as part of applications without affecting the different programming languages used on the progress of the process, such as NPM, Java, JavaScript, and other various software (Decan et al. 2019; Ren et al. 2019; Singi et al. 2019). This

Table 1 Synthesized the conceptual evolution regarding supply chain management

Author(s)	Definitions
Oliver and Webber (1982)	"Supply chain management is the process of planning, implementing, and controlling the operations of the supply chain with the purpose to satisfy customer requirements as efficiently as possible. Supply chain management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point-of-origin to point-of-consumption"
Tan et al. (1998)	"Supply chain management encompasses materials/supply management from the supply of basic raw materials to final product (and possible recycling and re-use). Supply chain management focuses on how firms utilize their suppliers' processes, technology and capability to enhance competitive advantage"
Bowersox et al. (2002)	"Supply chain (sometimes called the value chain or demand chain) management consists of firms collaborating to leverage strategic positioning and to improve operating efficiency. For each firm involved, the supply chain relationship reflects strategic choice. A supply chain strategy is a channel arrangement based on acknowledged dependency and relationship management. Supply chain operations require managerial processes that span across functional areas within individual firms and link trading partners and customers across organizational boundaries"
Sweeney (2007)	"Supply Chain Management is the systemic, strategic coordination of the traditional business function and tactics across these business functions within a particular company and across business within the supply chain, for the purpose of improving the long-term performance of the individual companies and the supply chain as a whole"
Krajewski et al. (2007)	"Supply chain management consists of developing a strategy to organize, control and motivate the resources involved in the flow of services and materials within the supply chain"
Bozarth and Handfield (2008)	"Supply chain management is the active management of supply chain activities"
Simchi-Levi et al. (2008)	"Supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantity, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements"
Wisner et al. (2012)	"Supply chain management is the integration of trading partners' key business processes from initial raw material extraction to the final or end customer, including all intermediate processing, transportation and storage activities and final sale to the end product customer"

work and association with software and third parties' results in a new and growing concern about the privacy and security of the information used and a lack of confidence in the confidentiality of that information (Ohm et al. 2020). Especially, when the development of application programming is done directly by external developers, which makes the validation of information as well as the management of applications in general more complex and difficult (Taylor et al. 2020). In addition, there are clear loopholes that allow intruders to penetrate the privacy of information in the supply chain programming, which includes social engineering as the most prominent example of these attacks and intrusion into the systems that manage that information (Levy 2003; Hata and Ishio 2022). As penetration operations are usually done by relying on persuading the owner and giving him full confidence and reassurance by the attacker or hacker. Then making the correction that is in the interest of the system in order to gain confidence until receiving the control key from the owner to manipulate and make harmful modifications and changes in information packages and work to steal secret keys for each user (Lamb and Zacchiroli 2021; Dey and Mockus 2018).

8   Blockchain Technology as a New Driver in Supply Chain

Blockchain technology is presented as one of the most important technologies that help solve the problems faced by the supply chain and its main new driver (Azzi et al. 2019). It is a tool capable of dramatically changing the way the traditional supply chain works (Helo and Shamsuzzoha 2020). Blockchain technology is a digital record that consists of a set of lists in the data record called blocks (Creydt and Fisher 2019). Which ultimately constitutes a set of information that is presented in digital form and that information usually revolves around three different topics (DHL Trend Research 2018). The first information relates to the commercial operations and the time it takes to complete those operations. The other part of that information relates to the participants in those commercial operations (Wang et al. 2018a). The use of real information about the names of the participants is replaced by digital information, which is represented by the digital signature of each individual, and finally the information that gives the advantage to each block from the others in a way that makes it coherent and stable. Blockchain technology makes the decision regarding changes a collective decision that requires the consent of all participants, including stakeholders, who are connected to the existence of the supply chain network (Černý et al. 2021). In which rights and obligations are distributed to all parties equally, and this process is done safely and continuity thanks to the presence of blockchain technology (Creydt and Fisher 2019).

9 The Main Technologies Can Support Both Blockchain and Supply Chain

The processes related to obtaining accurate information in a timely manner, storing it, and protecting it from intrusion, penetration, manipulation, and modification by strangers, are among the most important technologies that support both blockchain technology and the supply chain. In addition to the fact that these requirements are among the common points within the needs of the blockchain technology and the supply chain to obtain sufficient support to achieve the goals that each of them has been adopted in the organizations. For facilitating business in an inexpensive way in terms of material or time costs, the psychological cost in terms of providing a safety factor is of great benefit to the feeling and awareness of potential participants for adopting blockchain technology along with the supply chain to adopt social commerce in a safe and easy way. Thus, the need for protection and encryption techniques with technologies that allow the use of Internet services is one of the most important technologies that support both the supply chain and blockchain technology.

10 The Main Challenges and Solutions Related to Blockchain and Supply Chain

Frequent attacks on the security of information obtained and transmitted are among the most important challenges facing the application and adoption of blockchain technology in organizations (Zheng et al. 2018; Sun et al. 2019). As the security of the information obtained and stored is one of the most important factors that characterize the work of the blockchain technology (Singh et al. 2019). The main problems and challenges appear when implementing this technology over the Internet, when there are many intruders trying to access and manipulate information through Internet networks (Jiang et al. 2019). Several solutions have been proposed in the form of protection systems that work on information security and effectively maintain user privacy (Deng et al. 2019; Li et al. 2019). It works based on advanced encryption standards, ensuring the possibility of adequate immunization not to change or modify the information without the consent of the participants (Song et al. 2019).

On the other hand, the challenges facing the supply chain are seen through the requirements that must be met to achieve the purpose for which the supply chain was established (Msimangira and Venkatraman 2014). Integration is one of the most important keys to the success of the supply chain and one of its most important challenges at the same time (Casati et al. 2001; Sykes 2018). This is because this integration takes place in a very extensive way that extends between the various technologies adopted in the supply chain, in addition to the integration that must occur between many companies (Sweeney 2012; Sobb et al. 2020). Thus, it is necessary for the success of the supply chain in organizations and in order to solve this

problem that a kind of integration between technologies and systems across organizations is adopted in an agreed upon form between partners and protected through correspondence and encrypted exchanges (Rowan and Laffey 2020).

11 Conclusion

The integration of supply chain activities with blockchain technology makes the information systems that are adopted in the processes of transferring products from the place of their creation to the place of their consumption and the processes associated with obtaining information about trade exchange more quickly, securely, and less costly in terms of effort and time. Hence, the possibility of reducing unintended errors that occur between trading partners, resulting from a disparity in understanding some information and complete lack of agreement about some decisions. Therefore, the turmoil or integration, coordination, and stability can occur between trading partners is clearly reflected on consumers in a way that can increase their motives toward avoiding or adopting social commerce that they desire. Many consumers adopt social commerce depending on the speed of conducting business transactions, information security, and maintaining user privacy, which can be provided through the integration of blockchain technology with supply chain activities on social commerce platforms.

References

Abdellatif T, Brousmiche, KL (2018) Formal verification of smart contracts based on users and blockchain behaviors models. In: 2018 9th IFIP international conference on new technologies, mobility and security (NTMS), February, pp 1–5

Abdullah H, Thajil K, Alnoor A, Al-Abrrow H, Khaw KW, Chew XY, Sadaa A (2022) Predicting determinants of use mobile commerce through modelling non-linear relationships. Cent Eur Bus Rev 11(in press)

Ahram T, Sargolzaei A, Sargolzaei S, Daniels J, Amaba B (2017) Blockchain technology innovations. In: 2017 IEEE technology & engineering management conference (TEMSCON), pp 137–141

Alnoor A, Al-Abrrow H, Al Halbusi H, Khaw KW, Chew X, Al-Maatoq M, Alharbi RK (2022) Uncovering the antecedents of trust in social commerce: an application of the non-linear artificial neural network approach. Compet Rev. https://doi.org/10.1108/CR-04-2021-0051

Anderson DL, Britt FF, Favre DJ (2007) The 7 principles of supply chain management. Supply Chain Manag Rev 11(3):41–46

Angolia MG, Pagliari LR (2018) Experiential learning for logistics and supply chain management using an SAP ERP software simulation. Decis Sci J Innov Educ 16(2):104–125

Azzi R, Chamoun RK, Sokhn M (2019) The power of a blockchain-based supply chain. Comput Ind Eng 135:582–592. ISSN 0360-8352. https://doi.org/10.1016/j.cie.2019.06.042

Baydoun A, Ahmad F (2022) Knowledge base cloud framework for effective knowledge retention in software supply chain. Int J Eng Appl Sci Technol 1:1–6

Beyari HM, Abareshi A (2019) The interaction of trust and social influence factors in the social commerce environment. In: Advances in intelligent systems and computing. Proceedings of

the 3rd international conference of reliable information and communication technology (IRICT 2018), pp 931–944. Springer Link

Bhattacharya P, Tanwar S, Bodke U, Tyagi S, Kumar N (2019) BinDaaS: blockchain-based deep-learning as-a-service in healthcare 4.0 applications. IEEE Trans Netw Sci Eng 8:1242–1255

Bodke U, Tanwar S (2020) Secure data dissemination techniques for IoT applications: research challenges and opportunities. Softw Pract Exper 51:2469–2491

Bodke U, Tanwar S, Parekh K, Khanpara P, Tyagi S, Kumar N, Alazab M (2020) Blockchain for industry 4.0: a comprehensive review. IEEE Access 8:79764–79800

Bowersox D, Closs D, Cooper B (2002) Supply chain logistics management. McGraw-Hill/Irwin, New York

Bozarth C, Handfield RB (2008) Introduction to operations and supply chain management, 2nd edn. Pearson Prentice Hall, Upper Saddle River

Carmody S, Coravos A, Fahs G, Hatch A, Medina J, Woods B, Corman J (2021) Building resilient medical technology supply chains with a software bill of materials. NPJ Digit Med 4(1):1–6

Casati F, Dayal U, Shan MC (2001) E-business applications for supply chain management: challenges and solutions. In: Proceedings 17th international conference on data engineering, pp 71–78

Catalini C, Gans JS (2020) Some simple economics of the blockchain. Commun ACM 63(7):80–90

Černý M, Gogola M, Kubaľák S, Ondruš J (2021) Blockchain technology as a new driver in supply chain. Transp Res Procedia 55:299–306

Cohen S, Roussel J (2022) Strategic supply chain management. McGraw-Hill

Cox A (1999) Power, value and supply chain management. Supply Chain Manag: Int J 4(4):167–175

Cox R (2019) Surviving software dependencies. Commun ACM 62(9):36–43

Creydt M, Fisher M (2019) Blockchain and more—algorithm driven food traceability. Food Control 105:45–51. ISSN 0956-7135

Croxton KL, Garcia-Dastugue SJ, Lambert DM, Rogers DS (2001) The supply chain management processes. Int J Logist Manag 12(2):13–36

Curchoe CL (2022) The blockchain and decentralized manipulation of confidential information: uses in medical healthcare and assisted reproduction. J Assist Reprod Genet 39:317–319

Calvaresi D, Dubovitskaya A, Calbimonte JP, Taveter K, Schumacher M (2018) Multi-agent systems and blockchain: results from a systematic literature review. April

Crandall RE, Crandall WR, Chen CC (2015) Principles of supply chain management, 2nd edn. CRC Press, Boca Raton

Dasaklis TK, Casino F, Patsakis C, Douligeris C (2019) A framework for supply chain traceability based on blockchain tokens. In: International Conference on Business Process Management, pp 704–716

Decan A, Mens T, Grosjean P (2019) An empirical comparison of dependency network evolution in seven software packaging ecosystems. Empir Softw Eng 24(1):381–416

Deng Z, Ren Y, Liu Y, Yin X, Shen Z, Kim H (2019) Blockchain-based trusted electronic records preservation in cloud storage. Comput Mater Continua 58(1):135–151

Dey T, Mockus A (2018) Are software dependency supply chain metrics useful in predicting change of popularity of NPM packages? In: Proceedings of the 14th international conference on predictive models and data analytics in software engineering, pp 66–69

DHL Trend Research (2018) Blockchain in logistics [cited: 27 November 2020]

Dinh TTA, Wang J, Chen G, Liu R, Ooi BC, Tan K-L (2017) BLOCKBENCH: a framework for analyzing private blockchains. In: Proceedings of the ACM international conference on management of data, pp 1085–1100

Drescher D (2017) Blockchain basics: a non-technical introduction in 25 steps. Apress, New York, p 33

Eggers S (2021) A novel approach for analyzing the nuclear supply chain cyber-attack surface. Nucl Eng Technol 53(3):879–887

Elgendy A (2021) The mediating effect of big data analysis on the process orientation and information system software to improve supply chain process in Saudi Arabian industrial organizations. Int J Data Netw Sci 5(2):135–142

Ellram LM, Tate WL, Billington C (2004) Understanding and managing the services supply chain. J Supply Chain Manag 40(3):17–32

Foster ST, Ganguly KK (2007) Managing quality: integrating the supply chain. Pearson Prentice Hall, Upper Saddle River, NJ, pp 256–266

Fraga-Lamas P, Fernandez-Carames TM (2019) A review on blockchain technologies for an advanced and cyber-resilient automotive industry. IEEE Access 7:17578–17598

Glaser F (2017) Pervasive decentralisation of digital infrastructures: a framework for blockchain enabled system and use case analysis. In: Proceedings of the 50th Hawaii international conference on system sciences (HICSS 2017), Waikoloa Village, Hawaii

Hanaysha JR, Alzoubi HM (2022) The effect of digital supply chain on organizational performance: an empirical study in Malaysia manufacturing industry. Uncertain Supply Chain Manag 10(2):495–510

Harrand N, Durieux T, Broman D, Baudry B (2021) Automatic diversity in the software supply chain. arXiv preprint arXiv:2111.03154

Hata H, Ishio T (2022) Software supply chain map: how reuse networks expand. arXiv preprint arXiv:2204.06531

Helo P, Hao Y (2019) Blockchains in operations and supply chains: a model and reference implementation. Comput Ind Eng 136:242–251

Helo P, Shamsuzzoha AHM (2020) Real-time supply chain—a blockchain architecture for project deliveries, Robot Comput Integr Manuf 63:101909. ISSN 0736 5845. https://doi.org/10.1016/j.rcim.2019.101909

Herr T (2021) Breaking trust: shades of crisis across an insecure software supply chain. Atlantic Council

Houlihan JB (1985) International supply chain management. Int J Phys Distrib Mater Manag 15(1):22–38

Ivanov D, Dolgui A, Sokolov B (2022) Cloud supply chain: integrating industry 4.0 and digital platforms in the "Supply Chain-as-a-Service". Transp Res Part E: Logist Transp Rev 160:102676

Jhala KS, Oak R, Khare M (2018) Smart collaboration mechanism using blockchain technology. In: Proceedings of 5th IEEE international conference on cyber security and cloud computing (CSCloud) 4th IEEE international conference edge computing scalable cloud (EdgeCom), pp 117–121

Jiang X, Liu M, Yang C, Liu Y, Wang R (2019) A blockchain-based authentication protocol for WLAN mesh security access. Comput Mater Continua 58(1):45–59

Johng H, Kim D, Hill T, Chung L (2018) Using blockchain to enhance the trustworthiness of business processes: a goal-oriented approach. In: Proceedings of international conference on services computing (SCC), pp 249–252

Katoch R (2022) IoT research in supply chain management and logistics: a bibliometric analysis using vosviewer software. Mater Today: Proc 56:2505–2515

Khan MA, Salah K (2018) IoT security: review, blockchain solutions, and open challenges. Future Gener Comput Syst 82:395–411

Kim SW (2003) An investigation of information technology investment on buyer-supplier relationship and supply chain dynamics. Unpublished Doctoral Dissertation, Michigan State University, Michigan, IL. Retrieved from: http://wwwlib.umi.com/dissertation

Kopyto M, Lechler S, von der Gracht H, Hartmann E (2020) Potentials of blockchain technology in supply chain management: long-term judgments of an international expert panel. Technol Forecast Soc Chang 161:120330. ISSN 0040-1625

Krajewski LJ, Ritzman LP, Malhotra MK (2007) Operations management: processes and value chains. Pearson Prentice Hall, Upper Saddle River

Kshetri N (2017) 1 blockchain's roles in meeting key supply chain management objectives, Int J Inf Manag 39(2018):80–89. ISSN 0268-4012. https://doi.org/10.1016/j.ijinfomgt.2017.12.005

Lamb C, Zacchiroli S (2021) Reproducible builds: increasing the integrity of software supply chains. IEEE Softw 39:62–70

Lambert DM, Cooper MC (2000) Issues in supply chain management. Ind Mark Manage 29(1):65–83

Lee K, Romzi P, Hanaysha J, Alzoubi H, Alshurideh M (2022) Investigating the impact of benefits and challenges of IOT adoption on supply chain performance and organizational performance: an empirical study in Malaysia. Uncertain Supply Chain Manag 10(2):537–550

Levy E (2003) Poisoning the software supply chain. IEEE Secur Priv 1(3):70–73

Li C, Xu G, Chen Y, Ahmad H, Li J (2019) A new anti-quantum proxy blind signature for blockchain-enabled Internet of Things. Comput Mater Continua 61(2):711–726

Li X, Jiang P, Chen T, Luo X, Wen Q (2017) A survey on the security of blockchain systems. Futur Gener Comput Syst 107:841—853

Lizcano D, Lara JA, White B, Aljawarneh S (2020) Blockchain-based approach to create a model of trust in open and ubiquitous higher education. J Comput High Educ 32(1):109–134

Lopes V, Alexandre LA (2018) An overview of blockchain integration with robotics and artificial intelligence. arXiv preprint arXiv:1810.00329

Min H, Zhou G (2002) Supply chain modeling: past, present and future. Comput Ind Eng 43(1–2):231–249

Mingxiao D, Xiaofeng M, Zhe Z, Xiangwei W, Qijun C (2017) A review on consensus algorithm of blockchain. In: 2017 IEEE international conference on systems, man, and cybernetics, SMC, 2017 January, pp 2567–2572

Mistry I et al (2020) Blockchain for 5G-enabled IoT for industrial automation: a systematic review, solutions, and challenges. Mech Syst Signal Process 135:106382

Mohan C (2018) Blockchains and databases: a new era in distributed computing. Retrieved from: http://www.hpts.ws/papers/2017/mohan.pdf. Accessed on 28 February

Moosavi J, Fatholahi-Fard AM, Dulebenets MA (2022) Supply chain disruption during the COVID-19 pandemic: recognizing potential disruption management strategies. Int J Disaster Risk Reduct 75:102983

Msimangira K, Venkatraman S (2014) Supply chain management integration: critical problems and solutions. Oper Supply Chain Manag: Int J 7(1):23–31

Nofer M, Gomber P, Hinz O, Schiereck D (2017) Blockchain. Bus Inf Syst Eng 59(3):183–187

Ohm M, Plate H, Sykosch A, Meier M (2020) Backstabber's knife collection: a review of open source software supply chain attacks. In: Proceedings of DIMVA, pp 23–24

Oliver RK, Webber MD (1982) Supply-chain management: logistics catches up with strategy. In: Christopher M (ed) (1992) Logistics: the strategic issues. Chapman & Hall, London, pp 63–75

Omar IA, Jayaraman R, Salah K, Yaqoob I, Ellahham S (2021) Applications of blockchain technology in clinical trials: review and open challenges. Arab J Sci Eng 46(4):3001–3015

Pradeepkumar DS, Singi K, Kaulgud V, Podder S (2018) Evaluating complexity and digitizability of regulations and contracts for a blockchain application design. In: 2018 IEEE/ACM 1st international workshop on emerging trends in software engineering for blockchain (WETSEB), pp 25–29

Puthal D, Malik N, Mohanty S, Kougianos E, Yang C (2018) The blockchain as a decentralized security framework. IEEE Consum Electron Mag 7(2):18–21

Raja Santhi A, Muthuswamy P (2022) Influence of blockchain technology in manufacturing supply chain and logistics. Logistics 6(1):15

Ren J, Zhao Q, Liu B, Chen C (2019) Selection of pallet management strategies from the perspective of supply chain cost with Anylogic software. PLoS ONE 14(6):e0217995

Rowan NJ, Laffey JG (2020) Challenges and solutions for addressing critical shortage of supply chain for personal and protective equipment (PPE) arising from Coronavirus disease (COVID19) pandemic—case study from the Republic of Ireland. Sci Total Environ 725:138532

Sagirlar G, Carminati B, Ferrari E, Sheehan JD, Ragnoli E (2018) Hybrid-IoT: hybrid blockchain architecture for internet of things-pow sub-blockchains. In: 2018 IEEE international conference on Internet of Things (iThings) and IEEE green computing and communications (GreenCom)

and IEEE cyber, physical and social computing (CPSCom) and IEEE smart data, smartdata, pp 1007–1016

Shamout M, Ben-Abdallah R, Alshurideh M, Alzoubi H, Kurdi B, Hamadneh S (2022) A conceptual model for the adoption of autonomous robots in supply chain and logistics industry. Uncertain Supply Chain Manag 10(2):577–592

Sharma M, Kamble S, Mani V, Sehrawat R, Belhadi A, Sharma V (2020) Industry 4.0 adoption for sustainability in multi-tier manufacturing supply chain in emerging economies. J Clean Prod:125013. ISSN 0959-6526

Simchi-Levi D, Kaminsky P, Simchi-Levi E (2008) Designing and managing the supply chain: concepts, strategies, and case studies, 3rd edn. Mc Graw Hill, New York

Singh S, Ra IH, Meng W, Kaur M, Cho GH (2019) SH-BlockCC: a secure and efficient Internet of Things smart home architecture based on cloud computing and blockchain technology. Int J Distrib Sensor Netw 15(4):1–17

Singi K, Bose RPJC, Podder S, Burden AP (2019) Trusted software supply chain. In: 2019 34th IEEE/ACM international conference on automated software engineering (ASE), pp 1212–1213

Sobb T, Turnbull B, Moustafa N (2020) Supply chain 4.0: a survey of cyber security challenges, solutions and future directions. Electron 9(11):1864

Song R, Song Y, Liu Z, Tang M, Zhou K (2019) GaiaWorld: a novel blockchain system based on competitive PoS consensus mechanism. Comput Mater Continua 60(3):973–987

Soni G, Kumar S, Mahto RV, Mangla SK, Mittal ML, Lim WM (2022) A decision-making framework for Industry 4.0 technology implementation: the case of FinTech and sustainable supply chain finance for SMEs. Technol Forecast Soc Chang 180:121686

Stadtler H (2008) Supply chain management—an overview. In: Supply chain management and advanced planning. Springer, Berlin, Heidelberg, 9–36

Sulaeman MM, Harsono M (2021) Supply chain ontology: model overview and synthesis. Jurnal Mantik 5(2):790–799

Sun G, Bin S, Jiang M, Cao N, Zheng Z, Zhao H, Wang D, Xu L (2019) Research on public opinion propagation model in social network based on blockchain. Comput Mater Continua 60(3):1015–1027

Sunil C, Meindl P (2001) Supply chain management: strategy, planning, and operations. Prentice-Hall, Inc., Upper Saddle River, NJ

Swanson T (2015) Consensus-as-a-service: a brief report on the emergence of permissioned, distributed ledger systems. Work Pap

Sweeney E (2007) Perspectives on supply chain management and logistics. Blackhall Publishing, Dublin

Sweeney E (2012) Supply chain integration: challenges and solutions. In: Supply chain innovation for competing in highly dynamic markets: challenges and solutions. IGI Global, Hershey, PA, pp 1–26

Sykes C (2018) Time-and temperature-controlled transport: supply chain challenges and solutions. Pharm Ther 43(3):154

Tan KC, Kannan VR, Handfield RB (1998) Supply chain management: supplier performance and firm performance. Int J Purch Mater Manag 34(3):2–9

Taylor M, Vaidya R, Davidson D, De Carli L, Rastogi V (2020) Defending against package typosquatting. In Proceedings of the international conference on network & system security, pp 112–131

Vishwa A, Hussain FK (2018) A blockchain based approach for multimedia privacy protection and provenance. In: 2018 IEEE symposium series on computational intelligence (SSCI), pp 1941–1945

Vora J, DevMurari P, Tanwar S, Tyagi S, Kumar N, Obaidat MS (2018a) Blind signatures based secured E-Healthcare system. In: Proceedings of international conference on computer, information, and telecommunication systems (CITS), pp 1–5

Vora J, Italiya P, Tanwar S, Tyagi S, Kumar N, Obaidat MS, Hsiao K-F (2018b) Ensuring privacy and security in E-health records. In: Proceedings of international conference on computer, information, and telecommunication systems (CITS), pp 1–5

Vu DL, Pashchenko I, Massacci F, Plate H, Sabetta A (2020) Towards using source code repositories to identify software supply chain attacks. In: Proceedings of the 2020 ACM SIGSAC conference on computer and communications security, pp 2093–2095

Wang H, Chen K, Xu D (2016) A maturity model for blockchain adoption. Financ Innov 2(1):1–5

Wang Q, Guo S, Yiu KFC (2020) Distributed acoustic beamforming with blockchain protection. IEEE Trans Industr Inf 16(11):7126–7135

Wang X, Xu X, Feagan L, Huang S, Jiao L, Zhao W (2018a) Inter-bank payment system on enterprise blockchain platform. In: Proceedings of IEEE 11th international conference on cloud computing (cloud), pp 614–621

Wang Y, Hugh Han J, Davies PB (2018b) Understanding blockchain technology for future supply chains: a systematic literature review and research. Agenda 24:62–84

Wisner J, Tan KC, Leong GK (2012) Principles of supply chain management: a balanced approach, 3rd edn. South-Western Cengage Learning, Mason

Wust K, Gervais A (2018) Do you need a blockchain? In: 2018 crypto valley conference on blockchain technology (CVCBT), no. i, pp 45–54. Retrieved from: https://ieeexplore.ieee.org/document/8525392/

Yaga D, Mell P, Roby N, Scarfone K (2019) Blockchain technology overview. arXiv preprint arXiv:1906.11078

Yue K, Zhang Y, Chen Y, Li Y, Zhao L, Rong C, Chen L (2021) A survey of decentralizing applications via blockchain: the 5G and beyond perspective. IEEE Commun Surv Tutor 23(4):2191–2217

Zhang H, Nakamura T, Sakurai K (2019) Security and trust issues on digital supply chain. In: 2019 IEEE international conference on dependable, autonomic and secure computing, international conference on pervasive intelligence and computing, international conference on cloud and big data computing, international conference on cyber science and technology congress (DASC/PiCom/CBDCom/CyberSciTech), pp 338–343

Zhang J, Sethi SP, Choi TM, Cheng TCE (2022) Pareto optimality and contract dependence in supply chain coordination with risk-averse agents. Prod Oper Manag 31: 2557–2570

Zheng R (2021) Applications research of blockchain technology in accounting system. J Phys: Conf Ser 1955(1):012068

Zheng Z, Xie S, Dai H, Chen X, Wang H (2017) An overview of blockchain technology: architecture, consensus, and future trends. In: Proceedings of the IEEE international congress on big data, June 2017, pp 557–564

Zheng Z, Xie S, Dai HN, Chen X, Wang H (2018) Blockchain challenges and opportunities: a survey. Int J Web Grid Services 14(4):352–375

Zhu S, Cai Z, Hu H, Li Y, Li W (2019) zkCrowd: a hybrid blockchain-based crowdsourcing platform. IEEE Trans Industr Inf 16(6):4196–4205

Zilberman D, Reardon T, Silver J, Lu L, Heiman A (2022) From the laboratory to the consumer: innovation, supply chain, and adoption with applications to natural resources. Proc Natl Acad Sci 119(23):e2115880119

Dr. Krar Muhsin Thajil is a Senior Lecturer at the Mazaya University, Department of Business Administration, Nasiriyah, Iraq. He published many papers in high-impact journals.

Dr. Hadi AL-Abrrow is a professor of organization studies at the University of Basrah in Iraq. He earned his doctoral degree in business administration from the University of Essex in the United Kingdom. His research interests include organization studies, organizational behavior, leadership,

and innovation. The author of numerous journal articles, Dr. AL-Abrrow is a reviewer for *European Management ReviewInternational Journal of Organizational AnalysisJournal of Management and Health Organization*, and *Global Business and Organizational Excellence (GBOE)*. He can be reached at hauni_2000@yahoo.com.

Dr. Hasan Oudah Abdullah is a lecturer at Basrah University College for Science and Technology in Iraq and a human development coach. He is now a Ph.D. student in business administration at the University of Basrah-Iraq. He is a researcher, who has published research in various journals. He serves as a reviewer for the *International Journal of Organizational Analysis* and *Journal of Health Organization and Management*. He can be reached at hasan_oudah@yahoo.com.

Mobile Commerce and Social Commerce with the Development of Web 2.0 Technology

Nadia A. Atshan, Hadi Al-Abrrow, Hasan Oudah Abdullah, and Hussam Al Halbusi

1   Introduction

Today, commerce is considered one of the most important lifelines, especially when it was linked to the Internet. As a result, online shopping has gained significant popularity (Vărzaru et al. 2021; Omar et al. 2021). With the availability of the Internet and smartphones all over the world as well as the spread of the global epidemic, e-commerce has become an ideal solution (Manchanda and Deb 2021). Therefore, the goal of international companies and institutions was to invest the factors of the smartphone and the Internet to expand their customer base and profits (Salimon et al. 2021; Cheng et al. 2019). A US survey conducted by eCommerce.com found that nearly half of phone users purchased something via smartphones in the last year (2019).Mobile commerce and e-commerce have several advantages that make consumers buy (Sardjono et al. 2020):

1. Can be used anywhere connected to the Internet.
2. Allows conducting transactions between countries.
3. Using international standards.
4. Easy to provide feedback during the transaction.
5. Information on more diverse products that can be in the form of photos or videos.

N. A. Atshan
Management Technical College, Southern Technical University, Basrah, Iraq

H. Al-Abrrow
Business Administration Department, University of Basrah, Basrah, Iraq

H. O. Abdullah
Basra University College of Science and Technology, Basrah, Iraq

H. Al Halbusi (✉)
Department of Management, Ahmed Bin Mohammad Military College, Doha, Qatar
e-mail: Hussam.mba@gmail.com

There are four levels of m-commerce: commercial applications, operating system-to-commercial application integration (middleware), the hardware used to access wireless networks, and networks' hardware (Balasubraman et al. 2002; El-Ebiary et al. 2021). The principal function of an m-commerce transaction is to promote and trade the merchandise anytime and anywhere (Benou and Vassilakis 2010); in combination with mobile devices that are generally readily accessible and applications that are straightforward to use. Consumers prefer to use their mobile devices rather than PCs for practical reasons, regardless of where they are, so M-commerce is the most accessible form of e-commerce. Today, mobile devices provide comfort and convenience in consumer transactions, allowing consumers to enjoy a pleasant experience and leading to a new consumer habit (Vărzaru and Bocean 2021).

As the concept of mobile commerce is used to define e-commerce in a broader sense, it is noted that the latter has expanded significantly and now includes trade in a broad range of goods, including information in electronic form. Mobile communications are largely overlooked as a means of accelerating purchases in e-commerce (Omar et al. 2021; Han et al. 2018), since e-commerce theory is based on networks, not mobile communication (Omar et al. 2021; Han et al. 2018). As international trade has evolved from conventional processes to e-commerce, e-commerce and m-commerce have spread through new firms, customers, and products. In addition, 22 billion visitors visited e-commerce sites in 2020, with food, clothing, and retail technical goods becoming extremely popular (Chen et al. 2019).

Since wireless computing power has become a part of e-commerce, it has enabled many new technologies to be introduced to mobile commerce (e-commerce). The success of m-commerce relies heavily on the quality of its content; m-commerce must satisfy both previously unmet and newly discovered requirements. Providing offers that traditional e-commerce lacks will help organizations reach as many consumers as possible through mobile commerce since content can be rethought several times to achieve a specific service (Feng et al. 2006). In order to solve these problems, many companies strive to find appropriate and satisfactory solutions for their customers. Recently, digital consumers are no longer anonymous, and there are several conditions for identification. The system was either accepted or not by all users, as these problems were primarily controlled (Eastin et al. 2016).

2   Social Commerce

Consumers' purchasing and consumption patterns have changed due to advances in wireless technologies and portable gadgets that are part of the fourth industrial revolution (Vărzaru and Bocean 2021; Liao et al. 2021). For scholars and practitioners, social commerce has emerged as a new subject of study in this era of technology because of the rapid growth and dissemination of this kind of trade in society (Zhou et al. 2013). Thus, products and services via social media can be defined as social commerce. Social commerce has always gained a lot of attention to provide a framework for future commercial channels on the Internet. Using

social commerce allows businesses to engage international consumers more efficiently than they can through traditional retail outlets. Through social commerce, businesses can integrate customer-generated content directly into their storefronts, allowing customers to collaborate online and share product information (Zhang and Wang 2012). Social commerce offers the advantage of displaying paid advertisements tailored to a consumer's preferences, often referred to as personalization. OPA (Online Personalized Advertising) is a type of advertisement that is displayed on advertising media that is tailored to users based on a combination of browsing activity, previously made purchases, and personal data (Baek and Morimoto 2012).

Nevertheless, some customers remain suspicious of social networking sites despite their rapid expansion (Cutshall et al. 2022). The key to maintaining the trend is to enhance customer engagement by cultivating trust in social commerce and utilizing social networking's potential (Al-Kubaisi and Abu-Shanab 2022; Sim et al. 2021). Buyers may also be more willing to divulge their identities or make purchases on social commerce sites if they believe that trust helps to minimize their perceived risk of interacting with online vendors (Susilo et al. 2022; Busalim and Ghabban 2021), where introducing social commerce websites, which offer customers a new shopping experience, is a good way for businesses to engage their customers (Changchit et al. 2022).

Social media have opened the door to the new shopping experience without a third-party intermediary. This type of social commerce is becoming increasingly popular in developing countries, providing an avenue for entrepreneurs to develop their businesses (Gefen and Straub 2004). E-commerce can now have social interactions with customers thanks to social commerce constructs (SCCs). These platforms are designed using Web 2.0 technologies (Liang and Turban 2011), and electronic sellers use them to communicate with customers, establish trust, and facilitate communication between customers (Hajli 2012). The product or service before purchasing is to verify it, and the other is to provide information or advice after the purchase, as it can be called feedback (Lin and Wang 2022). Social commerce can also involve a set of levels (social identification, social conversation, social communication, and commercial activities) (Meydani et al. 2022), where social identity is concerned in order to find out whether consumers are willing to pay and what their loyalty intentions are toward buying (Bauer and Smeets 2015), while the second level expresses social conversation which is intended the social behaviors used when initiating social commerce such as encouragement, reassurance, approval, and praise enable the maintenance as well as the retention of social relationships with customers (Gulz et al. 2011). In addition, social communication, which is considered the third level, is tasked with promoting deep communication to understand implicit signals and convey the feelings of consumers when dealing with them (Sterley and Bains 2021), while commercial activities can contribute to the interpretation of commercial development and at the same time anticipate and plan strategies and future measures on a larger scale (Chatzikonstantinou 2022).

3   Mobile Commerce

Mobile commerce can become a primary method for many users to conduct transactions with the spread of m-commerce usage worldwide. In the m-commerce market, technological advancements and mounting consumer engagement have resulted in emerging business innovations. Product presentations on m-commerce platforms have shifted from simple textual and graphical descriptions to more vivid consumption content formats (Yang et al. 2021). Globally, m-commerce videos have become increasingly popular among users due to the high quality of the Internet, especially product videos created by consumers have become increasingly significant to user decisions (Ngubelanga and Duffett 2021). In recent years, mobile commerce (m-commerce) has proliferated in value, as well as in the number of m-commerce service providers, as well as the amount of interest it has received from consumers and academics (Kalinić et al. 2021). Mobile commerce is the activity of conducting business using mobile phone that have Internet access (Chong 2013; Chau et al. 2021).

Web 2.0 technology has specifically launched many innovative technologies, the most prominent of which is the mobile phone, which is the primary driver of mobile commerce (Gupta et al. 2022). As these changes can be viewed as a development in the commercial sector, mobile commerce is on the rise. The use of networks to strengthen the retail component in real time, with identifying customers to eliminate security issues, giving priority time and allocation (Zeng et al. 2003; Zhang et al. 2021). Overall, mobile commerce is regarded as the most influential factor in customers' propensity to make online purchases and the strongest relationship between buyers and sellers. Moreover, it is vital as it will provide the most relevant and relevant message to sellers and buyers. Customer behavior is a significant factor in facilitating online electronic service (Baker et al. 2021; Qusef et al. 2021). With the use of e-commerce and mobile commerce, consumers are able to do transactions online more quickly, and consumers are given various options according to their needs. They can perform a comparison in a shorter amount of time. This leads to a more convenient shopping experience and fosters consumer confidence (Sardjono et al. 2019).

In response to the growing popularity of mobile apps, businesses around the world are turning to mobile commerce applications (MCAs) as an additional channel for doing business. With MCA, customers can search, order, find, or transact anywhere and anytime from their smartphones, whether it's for banking, e-hailing, retail, or order and delivery services (Ngubelanga and Duffett 2021). Using the mobile browser, retailers can access their web applications, mobile apps, and mobile websites to sell their products. With a tablet, smartphone, or another mobile device, customers can easily and conveniently buy a brand's products (Grøtnes 2009). Therefore, mobile payments will reach 1.3 billion by 2023, according to estimations (De Best 2020), where users have a high confidence level in mobile commerce apps. Hence, businesses continue to innovate their digital products to remain competitive in the digital marketplace (Prayitno et al. 2022).

4 Mobile Commerce in the Hospitality Sector

Many people believe m-commerce can only refer to the sale of tangible products through the Internet. However, services like those found in the tourism and hospitality industries can also be sold this way. E-commerce is an attractive client to the hotel industry, as more than 180 million bed nights were sold in 2015 (Banoobhai-Anwar and Keating 2016). There are many Small and Medium-sized Enterprises (SMEs) operating in the hospitality industry. A large percentage of the success of SMEs in the hospitality sector is directly proportional to the nations' economic growth. This illustrates that the use of m-commerce in hospitality SMEs is important for the country's growth in terms of commercial development (Al-Naimat et al. 2020). Modern technology has made it possible for tourism-related organizations to conduct business in an international way and have more efficient operations via greater data exchange and simpler booking systems. Mobile commerce has also impacted traditional businesses, such as High Street Travel Agencies and Airlines, as well as conventional booking systems (Liu 2012). M-commerce has led to a more significant number of options as well as increased competition for consumers and suppliers of tourism and hospitality services (Pipitwanichakarn and Wongtada 2019; Al-Naimat et al. 2020). M-commerce may help tourism and hospitality businesses compete more effectively by allowing them to:

a. Intranets for managing its internal processes.
b. Extranets for accepting connections with reliable partners.
c. The Internet for interaction with all its stakeholders and customers.

As mobile technologies improved communication and enhanced consumer availability, they had a good influence on airlines' and tourist organizations' strategic operations while providing their day-to-day operations a flexible nature (Algethmi 2014).

5 Mobile Commerce in the Banking Sector

M-commerce is a vital part of the development of the banking sector under the context of globalization. Banking transactions conducted on the Internet reduce time and costs, enabling banks to offer new products and expand their customer base. Because of this, countries that use e-commerce extensively have the fastest-growing banking sectors at the moment (Katamadze et al. 2021). Several aspects of our social behavior in the modern world have changed as a result of technological and demographic developments. By offering value-added, innovative services to their existing, technology-savvy customers, banks can retain and attract new customers from the relevant sections of society (Dilg et al. 2004). Because of their always-on functionality and ease of access, mobile banking technologies provide consumers with an additional avenue for banking transactions, which is potentially huge for consumers.

Mobile banking is a subset of electronic banking that underpins both the determinants of banking business and the unique conditions of mobile commerce. It is the latest and most innovative service offered by banks (Safeena et al. 2011). With the advent of emerging wireless and mobile networks, many new e-commerce applications will be possible and greatly benefited from a convenient, simple, secure, anytime, and anywhere banking model (Varshney and Vetter 2001). A well-thought-out strategy can significantly increase growth, strengthen competitive advantage, and contribute to long-term profitability due to attractive global growth opportunities (Roshandel-Arbatani et al. 2019). By utilizing telecommunication networks in the banking sector, many businesses have been able to perform the functions of e-commerce more easily and efficiently for quite some time now. According to the nature and operations of a business, different types of models are used (Azeem et al. 2015).

Mobile banking users are more likely to access information accurately, more easily, more quickly, and more flexibly compared to traditional bank customers, in addition to the quality of electronic banking services, which is very important. Liao and Cheung (2002) show that mobile banking users enjoy many advantages in comparison with traditional bank customers. As mobile trade services in banks provide facilities to improve the efficiency of mobile advertising and listen to opinions and recommendations on the future strategies of banks, as for the privacy of customers, these technologies have worked to guarantee the rights of users and maintain the efficiency of the system from any breaches (El-Ebiary et al. 2021).

6   Mobile Commerce in the Healthcare Sector

E-commerce has grown in every industry; however, as global Internet usage has increased in medical centers, hospitals, and maternal clinics. E-commerce also plays a critical role in meeting patient expectations and delivering the highest quality health care at the lowest cost (Shahzad et al. 2020). M-commerce particularly in hospitals may have a considerable influence and benefit, especially when deployed cautiously and intelligently in the areas where it can have the biggest impact and value. Many hospitals in the health sectors have used web technology to improve patient services, increase performance efficiency and service effectiveness, and then reach to save the largest possible number of lives (Anonymous 2003). Where hospitals have a long history with mobile technology because they were among the first institutions to adopt pagers (Turisco 2000), information about patients, treatments, and epidemics can be accessed in real time through e-commerce, and many examples of e-commerce relate to accessing e-medical records. However, there is some controversy as to whether mobile devices should be used only to access a subset of the registry, or whether they can be used to access the entire registry (Coonan 2002). Mobile applications provide a significant positive challenge to their purpose. Improved healthcare services and more flexibility for employees to connect with patients and suppliers will be achieved via the use of mobile apps, which will provide important real-time data to patients, physicians, insurers, and suppliers (Siau and

Shen 2006). Furthermore, mobile commerce reduces health care costs by eliminating the redundant time that occurs due to delays in many work, such as receiving patient records or arranging their entry times. It also reduces expenses for administrative work and enhances the quality of services provided (Jahanshahi et al. 2011). Health care with mobile commerce services is providing the best performance, improve efficiency, and enhance effectiveness (Bahlman and Johnson 2005).

7 Mobile Commerce in the Economy Sector

The spread of COVID-19 has led to the suspension of many facilities of life in all countries of the world, especially the economic ones. Many workers have interrupted their work due to the safety measures imposed by the epidemic. Thus, the activity of many people has shifted to e-commerce and mobile commerce as a means of working online and shopping as well. On the other hand, the advantages that mobile commerce give a great incentive to use it in the markets. The electronic market for selling goods and services is dominated (Khan and Shazia 2019), as consumers are increasingly turning to e-commerce due to technical developments, globalization, and liberalization of international trade as well as fluctuations in consumption habits. The development of communications and the availability of Wi-Fi in most public areas has led to the growth of mobile commerce significantly in recent times (Ghose et al. 2013). Smartphone users spend half of their Internet time, especially on online shopping (Dumanska et al. 2021). Companies in the economic sector are raising awareness of the potential of mobile commerce as mobile devices, and mobile applications continue to grow. M-commerce and e-commerce are channels of trading that are growing rapidly in popularity with technological developments (Kim 2020; Chauhan et al. 2021).

8 SEM and ANN Approach in Mobile Commerce

The (SEM, ANN) approach has been used in many studies to facilitate access to reliable results, especially in social commerce. This confirmatory method consists of two steps. The first step involves specifying the model and assessing and valuing it in preparation for testing it in the second step (Zabukovšek et al. 2019; Wang et al. 2022). A conventional model based on SEM is upgraded by integrating ANNs with SEM methodology. This two-stage approach is proposed to quantify and confirm each exogenous variable's importance to the endogenous variable (Milošević et al. 2021). According to Liébana-Cabanillas et al. (2017), SEM was used to identify the significant variables that contribute to m-commerce adoption, next a neural network model was used to identify how significant those variables are relative to each other. As for (Hidayat-ur-Rehman et al. 2022), SEM–ANN analysis was used to observe the relationship between intention-to-use and significant determinants. Likewise, partial

least squares structural equation modeling (PLS-SEM) was employed as a corroboration tool, and artificial neural networks were used to estimate the relative importance of the SEM-based significant determinants. This study provides powerful insights and recommendations for companies developing, executing, and marketing m-commerce services. The use of structural equation modeling showed that consumers have confidence in the products or services provided in mobile commerce in addition to their intention to buy is often large, and the number of consumers for this commerce can increase when sufficient attention is given to the presence and social support, where the researchers of this study concluded that social networking and commerce sites are used to encourage e-marketing and to enhance customer confidence in mobile commerce (Khaw et al. 2022). Comparing the two-stage SEM and ANN approach can allow generalizable results (Zabukovšek et al. 2019), where SEM and ANN can be applied to evaluate structural equation estimates (Xu et al. 2019).

9 Discussion and Conclusion

This chapter discusses how to make the most of mobile commerce and social networks to enhance social commerce and how mobile commerce can be used to take advantage of social commerce today, as mobile commerce technologies allow greater control over resources. Moreover, this technology increases the number of electronic consumers who buy goods and services and strengthens the relationship between businesses and customers. In addition, these technologies increase confidence in online shopping and improve access to high-quality products. In addition to the economic sector, the experiences of utilizing mobile commerce have been radicalized because of the numerous advantages of adopting these tactics in the health care and financial services sectors. The hospitality sector has also been radicalized. Since these methods allow accurate analysis of the data obtained from the study sample, the researchers discussed their experiments using the SEM and ANN approaches in mobile commerce to arrive at reliable and generalizable results. Furthermore, this chapter provides researchers and others interested in social commerce with information on the benefits and challenges of marketing their products and services electronically and how customers respond to these advanced technologies, emphasizing minimizing privacy concerns.

References

Algethmi MA (2014) Mobile commerce innovation in the airline sector: an investigation of mobile services acceptance in Saudi Arabia. Doctoral dissertation, Brunel University School of Engineering and Design PhD theses

Al-Kubaisi HH, Abu-Shanab EA (2022) Factors influencing trust in social commerce: the case of Qatar. Int J Electron Bus 17(1):13–36

Al-Naimat A, Alnuaimi MA, Abdulaal AM, Almuiet MZ (2020) Determinants of m-commerce usage in the Jordanian hospitality industry. J Theor Appl Inf Technol 98(23):3834–3842

Anonymous (2003) Look doc, no wires. Communications News 40(3):12–15

Azeem MM, Ozari A, Marsap P, Arhab P, Jilani AH (2015) Impact of e-commerce on organization performance; evidence from banking sector of Pakistan

Baek T, Morimoto M (2012) Stay away from me. J Advert 41(1):59–76. https://doi.org/10.2753/JOA0091-3367410105

Bahlman DT, Johnson FC (2005) Using technology to improve and support communication and workflow processes. Association of Operation Room Nurses 82(1):65

Baker YA, Julaily Aida J, Pathmanathan PR, Yasser Mohamed AT, Khairi A, Yazeed AM, et al (2021) Determinants of customer purchase intention using zalora mobile commerce application

Balasubraman S, Peterson RA, Jarvenpaa SL, Balasubramanian S (2002) Exploring the implications of m-commerce for markets and marketing. J Acad Mark Sci 30:348–361

Banoobhai-Anwar I, Keating K (2016) An investigation into e-commerce in hospitality: a Cape Town study

Bauer R, Smeets P (2015) Social identification and investment decisions. J Econ Behav Organ 117:121–134

Beatrix Cleff E (2007) Privacy issues in mobile advertising. International Review of Law Computers and Technology 21(3):225–236

Benou P, Vassilakis C (2010) The conceptual model of context for mobile commerce applications. Electron Commer Res 10(2):139–165

Busalim AH, Ghabban F (2021) Customer engagement behaviour on social commerce platforms: an empirical study. Technol Soc 64:101437

Camacho S, Barrios A (2021) Social commerce affordances for female entrepreneurship: the case of facebook. Electron Markets, 1–23.

Changchit C, Cutshall R, Pham A (2022) Personality and demographic characteristics influence on consumers' social commerce preference. Journal of Computer Information Systems 62(1):98–108

Chatzikonstantinou I (2022) Spatiotemporal patterns of commercial activities in Exarchia-Neapoli area

Chau NT, Deng H, Tay R (2021) A perception-based model for mobile commerce adoption in Vietnamese small and medium-sized enterprises. J Glob Inf Manag (JGIM) 29(1):44–67

Chauhan S, Kumar P, Jaiswal M (2021) A meta-analysis of m-commerce continuance intention: moderating impact of culture and user types. Behaviour & Information Technology, 1–19

Chen Q, Feng Y, Liu L, Tian X (2019) Understanding consumers' reactance of online personalized advertising: a new scheme of rational choice from a perspective of negative effects. Int J Inf Manage 44:53–64. https://doi.org/10.1016/j.ijinfomgt.2018.09.001

Cheng X, Gu Y, Shen J (2019) An integrated view of particularized trust in social commerce: an empirical investigation. Int J Inf Manage 45:1–12

Chong AYL (2013) Predicting m-commerce adoption determinants: a neural network approach. Expert Syst Appl 40(2):523–530

Coonan GM (2002) Making the most of mobility. Health Manag Technol 23(10):32–35

Cutshall R, Changchit C, Pham H, Pham D (2022) Determinants of social commerce adoption: an empirical study of Vietnamese consumers. Journal of Internet Commerce 21(2):133–159

De Best R (2020) Mobile payments worldwide-statistics & facts. Statista, November, 10.

Dilg IA, Friedrichsen M, Przyklenk G (2004) Mobile banking-Konzepte im internationalen Vergleich: Grundlagen für einen mobilen Vertriebskanal, July 2004, http://www.hdm-stuttgart.de/news/news20040813100933/stuttgarter_beitraege11.pdf, 10.05.2005

Dumanska I, Hrytsyna L, Kharun O, Matviiets O (2021) E-commerce and m-commerce as global trends of international trade caused by the Covid-19 pandemic.

Eastin MS, Brinson NH, Doorey A, Wilcox G (2016) Living in a big data world: predicting mobile commerce activity through privacy concerns. Comput Hum Behav 58:214–220

El-Ebiary YAB, Aseh K, Bamansoor S, Pande B, Abu-Ulbeh W, Yusoff MH, et al (2021, June) Mobile commerce and its apps-opportunities and threats in Malaysia. In 2021 2nd international conference on smart computing and electronic enterprise (ICSCEE). IEEE, pp 180–185

Feng H, Hoegler T, Stucky W (2006, June). Exploring the critical success factors for mobile commerce. In 2006 international conference on mobile business. IEEE, pp. 40–40

Gefen D, Straub DW (2004) Consumer trust in B2C e-commerce and the importance of social presence: experiments in e-products and e-services. Omega 32(6):407–424

Ghose A, Han SP, Xu (2013) Mobile commerce in the new tablet economy. In Proceedings of the 34th international conference on information systems (ICIS), pp. 1–18

Grøtnes E (2009) Standardization as open innovation: two cases from the mobile industry. Information Technology & People

Gulz A, Haake M, Silvervarg A (2011, June) Extending a teachable agent with a social conversation module–effects on student experiences and learning. In International conference on artificial intelligence in education. Springer, Berlin, Heidelberg, pp 106–114

Gupta A, Lowe D, Galhotra B (2022, March) Holistic view of elements for mobile commerce: technology, security and trust. In 2022 8th international conference on advanced computing and communication systems (ICACCS), vol 1, IEEE, pp 557–561

Hajli M (2012) An integrated model for e-commerce adoption at the customer level with the impact of social commerce. Int J Inf Sci Manag (Special-Issue 2012ECDC):77–97

Han H, Xu H, Chen H (2018) Social commerce: a systematic review and data synthesis. Electron Commer Res Appl 30:38–50

Hidayat-ur-Rehman I, Alzahrani S, Rehman MZ, Akhter F (2022) Determining the factors of m-wallets adoption. A twofold SEM-ANN approach. PLoS ONE 17(1):e0262954

Huang Z, Benyoucef M (2013) From e-commerce to social commerce: a close look at design features. Electron Commer Res Appl 12(4):246–259

Jahanshahi AA, Mirzaie A, Asadollahi A (2011) Mobile commerce beyond electronic commerce: issue and challenges. Asian J Bus Manag Sci 1(2):119–129

Kalinić Z, Marinković V, Kalinić L, Liébana-Cabanillas F (2021) Neural network modeling of consumer satisfaction in mobile commerce: an empirical analysis. Expert Syst Appl 175:114803

Kalinic Z, Marinkovic V, Molinillo S, Liébana-Cabanillas F (2019) A multi-analytical approach to peer-to-peer mobile payment acceptance prediction. J Retail Consum Serv 49:143–153

Katamadze D, Abuselidze G, Katamadze G, Slobodianyk A (2021) Challenges and prospects of e-commerce management in the banking sector. Econ Manag 18(1):19–32

Khan D, Shazia W (2019) Cyber security issues and challenges in E-commerce. In Proceedings of 10th international conference on digital strategies for organizational success

Khaw KW, Alnoor A, Al-Abrrow H, Chew X, Sadaa AM, Abbas S, Khattak ZZ (2022) Modelling and evaluating trust in mobile commerce: a hybrid three stage Fuzzy Delphi, structural equation modeling, and neural network approach. Int J Hum-Comput Int, 1–17

Kim EA (2020) Social distancing and public health guidelines at workplaces in Korea: responses to coronavirus disease-19. Saf Health Work 11(3):275–283

Liang T-P, Turban E (2011) Introduction to the special issue social commerce: a research framework for social commerce. Int J Electron Commer 16(2):5–14

Liao SH, Widowati R, Hsieh YC (2021) Investigating online social media users' behaviors for social commerce recommendations. Technol Soc 66:101655

Liao Z, Cheung MT (2002) Internet-based e-banking and consumer attitudes: an empirical study. Information & Management 39(4):283–295

Liébana-Cabanillas F, Marinković V, Kalinić Z (2017) A SEM-neural network approach for predicting antecedents of m-commerce acceptance. Int J Inf Manage 37(2):14–24

Lin X, Wang X (2022) Towards a model of social commerce: improving the effectiveness of e-commerce through leveraging social media tools based on consumers' dual roles. Eur J Inf Syst, 1–18

Liu M (2012) Internet marketing campaign for railway hotel. Satakunta University of Applied Sciences

Manchanda M, Deb M (2021) On m-commerce adoption and augmented reality: a study on apparel buying using m-commerce in Indian context. Journal of Internet Commerce 20(1):84–112

Meydani E, Düsing C, Fedrau A, Trier M (2022) The "black box" of social commerce platforms-a closer look at users' activities

Milošević I, Ruso J, Glogovac M, Arsić S, Rakić A (2021) An integrated SEM-ANN approach for predicting QMS achievements in Industry 4.0. Total Qual Manag Bus Excell, 1–17

Ngubelanga A, Duffett R (2021) Modeling mobile commerce applications' antecedents of customer satisfaction among millennials: an extended tam perspective. Sustainability 13(11):5973

Omar S, Mohsen K, Tsimonis G, Oozeerally A, Hsu JH (2021) M-commerce: the nexus between mobile shopping service quality and loyalty. J Retail Consum Serv 60:102468

Pipitwanichakarn T, Wongtada N (2019) Leveraging the technology acceptance model for mobile commerce adoption under distinct stages of adoption: a case of micro businesses. Asia Pac J Mark Logist 33(6):1415–1436

Prayitno HJ, Huda M, Rahmawati LE (2022, May) Directive speech acts of mobile commerce application advertising discourse on digital media in indonesian language learning. In International conference of learning on advance education (ICOLAE 2021). Atlantis Press, pp 296–311

Qusef A, Albadarneh A, Elish S, Muhanna M (2021) Mitigating personalization challenges in mobile commerce: an empirical study. Comput Electr Eng 89:106904

Roshandel-Arbatani T, Kawamorita H, Ghanbary S, Ebrahimi P (2019) Modelling media entrepreneurship in social media: SEM and MLP-ANN approach. AD-Minister 34:35–57

Safeena R, Hundewale N, Kamani A (2011) Customer's adoption of mobile-commerce a study on emerging economy. International Journal of e-Education, e-Business, e-Management and e-Learning 1(3):228

Salimon MG, Kareem O, Mokhtar SSM, Aliyu OA, Bamgbade JA, Adeleke AQ (2021) Malaysian SMEs m-commerce adoption: TAM 3, UTAUT 2 and TOE approach. IJTPM.

Saprikis V, Avlogiaris G (2021) Factors that determine the adoption intention of direct mobile purchases through social media apps. Information 12(11):449

Sardjono W, Laksmono BS, Yuniastuti E (2020) The social welfare factors of public transportation drivers with online application as a result of the 4.0 Industrial Revolution In Transportation. ICIC Express Letters 14(4):361–368

Sardjono W, Selviyanti E, Gia Perdana W (2019) The application of the factor analysis method to determine the performance of IT implementation in companies based on the IT balanced scorecard measurement method. JPCS 1538

Shahzad A, Hassan R, Abdullah NI, Hussain A, Fareed M (2020) COVID-19 impact on e-commerce usage: an empirical evidence from Malaysian healthcare industry. Humanities & Social Sciences Reviews 8(3):599–609

Siau K, Shen Z (2006) Mobile healthcare informatics. Med Inform Internet Med 31(2):89–99

Sim JJ, Loh SH, Wong KL, Choong CK (2021) Do we need trust transfer mechanisms? An m-commerce adoption perspective. J Theor Appl Electron Commer Res 16(6):2241–2262

Sterley TL, Bains JS (2021) Social communication of affective states. Curr Opin Neurobiol 68:44–51

Susilo GFA, Rani U, Khotijah SA (2022) The trusting beliefs of users and the intention to continue making purchases via social commerce. Journal of Indonesian Economy and Business 37(1):1–14

Turisco F (2000) Mobile computing is next technology frontier for healthcare providers. Healthc Financ Manage 54(11):78–80

Varshney U, Vetter R (2001, January) A framework for the emerging mobile commerce applications. In Proceedings of the 34th annual Hawaii international conference on system sciences. IEEE, pp. 10 pp.–

Vărzaru AA, Bocean CG (2021) A two-stage SEM–artificial neural network analysis of mobile commerce and its drivers. J Theor Appl Electron Commer Res 16(6):2304–2318

Vărzaru AA, Bocean CG, Rotea CC, Budică-Iacob AF (2021) Assessing antecedents of behavioral intention to use mobile technologies in e-commerce. Electronics 10(18):2231

Wang G, Tan GWH, Yuan Y, Ooi KB, Dwivedi YK (2022) Revisiting TAM2 in behavioral targeting advertising: a deep learning-based dual-stage SEM-ANN analysis. Technol Forecast Soc Chang 175:121345

Xu Y, Zhang W, Bao H, Zhang S, Xiang Y (2019) A SEM-neural network approach to predict customers' intention to purchase battery electric vehicles in China's Zhejiang province. Sustainability 11(11):3164. https://doi.org/10.3390/su11113164

Yang F, Tang J, Men J, Zheng X (2021) Consumer perceived value and impulse buying behavior on mobile commerce: the moderating effect of social influence. J Retail Consum Serv 63:102683

Zabukovšek S, Kalinic Z, Bobek S, Tominc P (2019) SEM–ANN based research of factors' impact on extended use of ERP systems. CEJOR 27(3):703–735. https://doi.org/10.1007/s10100-018-0592-1

Zeng EY, Yen DC, Hwang HG, Huang SM (2003) Mobile commerce: the convergence of e-commerce and wireless technology. International Journal of Advanced Media & Communications 4(3):302–322. https://doi.org/10.1504/IJSTM.2003.003432

Zhang HD, Chen SC, Ruangkanjanases A (2021) Benefits first: consumer trust repair in mobile commerce. J Theor Appl Electron Commer Res 16(4):1079–1096

Zhang P, Wang C (2012) The evolution of social commerce: an examination from the people, business, technology, and information perspective. Wang Chingning & Ping Zhang (2012), The Evolution of Social Commerce: an Examination from the People, Business, Technology, and Information Perspective. Communications of the AIS (CAIS) 31:105–127

Zhou L, Zhang P, Zimmermann HD (2013) Social commerce research: an integrated view. Electron Commer Res Appl 12(2):61–68

Nadia A. Atshan is a lecturer at the Southern Technical University, Management Technical College. She received her MBA from the University of Basrah. Her research interests lie in organizational studies.

Hadi Al-Abrrow is a professor of organization studies at the University of Basrah in Iraq. He earned his doctoral degree in business administration from the University of Essex in the United Kingdom. His research interests include organization studies, organizational behavior, leadership, and innovation. The author of numerous journal articles, Dr. AL-Abrrow is a reviewer for European Management Review, International Journal of Organizational Analysis, Journal of Management and Health Organization, and Global Business and Organizational Excellence (GBOE). He can be reached at hauni_2000@yahoo.com.

Hasan Oudah Abdullah is a lecturer at Basrah University College for Science and Technology in Iraq and a human development coach. He is now a Ph.D. student in business administration at the University of Basrah-Iraq. He is a researcher, who has published research in various journals. He serves as a reviewer for the International Journal of Organizational Analysis and Journal of Health Organization and Management. He can be reached at hasan_oudah@yahoo.com.

Hussam Al Halbusi holds a Ph.D. in Management and Administration, currently working as Assistant Professor at Management Department, Ahmed Bin Mohammed Military College

(ABMMC), Doha, Qatar. Hussam received my BSc degree with first-class honors from the University of Al Anbar in 2011. After completing my BSc in Business Management, he was awarded a Master's degree in Business policy from Fatih University Istanbul, Turkey 2015. He obtained his Ph.D. from the Faculty of Business and Accountancy (UMFBA), University of Malaya, Malaysia 2020. He researches interests lie in the areas of Strategic Management, Business Ethics, Leadership, Human Resources Management, Organizational Psychology, Organizational Sociology, Innovation, Entrepreneurship, SMEs, Technology Adaption, and Technology Addiction. He has published numerous scientific journal articles and conference papers. He is a regular reviewer of numerous prestigious journals. During his career, he was engaged in more than 50 projects.

Artificial Neural Network and Structural Equation Modeling Techniques: Technology of Marketing

How Electronic Word of Mouth (eWOM) and Trust Affect Customers' Intention

Raed Khamis Alharbi, Ghufran Alsaker, Noor Azira Binti Rushar Haimi, and Alhamdi Mohammed

1 Introduction

In addition to developments in information and communication technology (ICT), consumers are increasingly understanding the importance of using information and communication sites to help them make the right purchasing decisions (Leong et al. 2020). Marketers are keen to know how to extract value from their business relationships with consumers (Yadav et al. 2013). Social commerce (also known as social shopping sites) has evolved to combine social networking and shopping sites (Lu et al. 2010). Social commerce has developed an unprecedented way of doing business, that is, business moves from the market to the market space where fundamental changes have occurred in the business environment and customer mindset (Zhang and Benyoucef 2016). It has reshaped traditional e-commerce by combining the positives of social networking with the positives of online shopping (Utz et al. 2012; Hew et al. 2016) and introducing new ways to market business offerings through social platforms (Turban et al. 2010). Social media websites enable marketers to promote their business, products, and services to a large audience using social media such as Facebook, Instagram, WhatsApp, Yahoo, Twitter, and so on (Hassan et al. 2018). Understanding consumer behavior in the context of social commerce has become

R. K. Alharbi (✉)
Department of Finance, Majmaah University, Al Majmaah 11952, Saudi Arabia
e-mail: Raedalharbi99@gmail.com

G. Alsaker
Management Technical College, Southern Technical University, Basrah, Iraq
e-mail: ghufran.jbbara@stu.edu.iq

N. A. B. R. Haimi
School of Management, Universiti Sains Malaysia, Penang, Malaysia

A. Mohammed
Faculty of Accountancy, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

critical for companies that aim to influence consumers' behavior and leverage the strength of their social bonds to improve marketing power (Zhang et al. 2015).

Social commerce is a new e-commerce phenomenon that conducts e-commerce activities through social media platforms and applications. The main characteristics of the Internet environment are uncertainty and a high level of risk. Whether or not people use e-commerce sites is always affected by their level of trust and past experiences (Hammouri and Abu-Shanab 2017; Attar et al. 2021). Trust is often seen as a critical factor in social commerce in particular as a result of the influential and prominent role and the large amount of peer-generated content (Cheng et al. 2019). Trust is created between two parties when they have a history of trustworthy interactions. Social commerce represents a fundamentally different buying environment from traditional online business transactions (Sharma et al. 2019). Therefore, several attempts and studies have emerged to establish the determinants of social commerce by capturing linear and non-compensatory relationships on the basis of structural equation modeling and artificial neural networks. In this chapter, we examine the influence of the trust factor and eWOM in determining consumers' decisions to engage in the social commerce of their purchases.

2   Literature Review of Electronic Word of Mouth

The internet channels are one of the most important tools that companies rely on at the moment to market their goods. Therefore, these companies continuously monitor the reactions of their customers about the products and services. These reactions are called electronic word of mouth and many researchers agreed that electronic word of mouth can significantly affect the evaluation of the product and the decision of the new consumer (Wang 2011).

The negative of (eWOM) means negative feedback from customers on the company's website, which is usually about the product or service used by the customer, where (eWOM) has negative effects on the company's future and reputation in the market. In this regard, a study (Basuroy et al. 2003) that bad customer reviews significantly affect the box office, resulting in a lower level of revenue expected from those films in the coming weeks.

Researchers have agreed that negative feedback about a product or service has a greater impact on the company than positive feedback because negative feedback creates a bad impression on the new consumer and this bad impression is difficult to remove. It requires diligent efforts by companies since it is understood that it is not easy to change the conviction of individuals toward a product or service (Chevalier and Mayzlin 2006; Noort and Willemsen 2012). Some researchers see positive reactions having a greater impact than negative ones (Chevalier and Mayzlin 2006; Chen and Lurie 2013; Chang and Wu 2014).

Refers positive of (eWOM) to the good feedback expressed by customers about the product or service through their comments. Whether these comments are on the company's website or other social media. Many studies such as (Goldsmith and

Horowitz 2006; Liu 2006; Duan et al. 2008) have shown the level of impact of good feedback from existing consumers on potential consumers, which is positively reflected in the company's ability to achieve sustainability in success and provide better future opportunities. Therefore, we will explain factors of positive of eWOM.

3 Perceived Crowding

The concept of perceived crowding means that multiple-dimensional build is created from either human density that exists in a particular place (Machleit et al. 2000). Multidimensional means the directions of interaction between individuals within that space and the nature of the influence of one another. Hence, it includes two types: spatial crowding and human crowding. This is consistent with (McGrew 1970) earlier assumption that spatial crowding and human crowding are the main determinants of the perception of the level of crowding by others. *Spatial crowding* refers to the number of people within a specific place/space. In this regard, the company must provide sufficient space for the presence of people (whether real or moral) to express their opinions and comments about the goods and services provided by the company. Providing enough space for feedback helps other people (potential customers) to view them and form an appropriate perception about those products. On the other hand, *human crowding* means the number of comments and reactions generated by individuals and the level of interaction achieved as a result of these reactions and comments (Machleit et al. 2000). Literature found that human crowding has a significant impact on individuals. This effect has two important aspects: excitement and stress. The impact of stress comes through negative feedback from customers. Excitement is usually generated by positive reactions from individuals.

So it can be said that potential customers when they find there is a large number of comments and feedback on the company's website (spatial crowding) (Eroglu et al. 2005). Also, when there are interactions with feedback and comments either by the company itself or by other consumers (human crowding). This is where the conviction of potential consumers crystallizes by reading the feedback found on corporate websites. As a result of this conviction, the intention is present toward their behavior around the product or service.

4 Wearable Technology and eWOM

In recent years, wearable technology has spread widely and is worn by users to include tracking and discovery of technology-related information and analysis it physiological. Wearable technology gives us the ability to track our locations through GPS tracking systems, monitor fitness levels, and respond to text messages (Colley et al. 2020). Most importantly, these wearables allow us to do without our main devices, eliminating the need to extract them from our pockets. According to Koydemir and

Ozcan (2018), wearable devices are classified as follows, (1) medical devices (blood pressure watches and heart rate monitors), (2) electronic textiles (smart wear), (3) head-mounted devices (earphones and smart glasses), (4) devices that can be worn on the wrist represented by (smart bracelets and watches), and (5) other smart jewelry.

However, these applications of wearable technology are dominant in the current time. These wearable devices are popular primarily among users who practice sports and want to control their progress and their life balance. According to Chandrasekaran et al. (2021), the adoption of wearable technology can help users to improve their efficiency of exercise by nearly 80% more than the people who don't use wearable technology in their fitness. Moreover, the use of wearable technology has grown in the last four years from 9% to the 33% (Loncar-Turukalo et al. 2019). Thus, scholars and researchers seek to determine and explore the more important factors that impact the adoption of wearable technology devices, in addition to exploring the implications based on them for increasing usage.

The repercussions of the use of wearable technology have spread strongly in the last few years. A study carried out by Sharifi et al. (2021) described that the technology of wearable devices can generate health problems in the medical fields such as aging, disabilities, and physical fitness, in addition to problems in education, absorption, financing, transportation, games, projects, and music. Sovacool and Del Rio (2020) also indicated that wearable devices were used in the fields of military technology and much before their presence in the consumer market. Analysts and experts also expect that wearable technology will have a significant impact on the support, development, and spread of technological culture widely, and it is likely that there will be radical changes in phones and other mobile devices in the next few years (Cappiello 2020).

At the present time, we see that wearable technology is prevalent in the electronic markets and at a very high rate. Smart speakers and smartwatches in addition to smart glasses occupied the most used platform for wearable technology (Ashfaq et al. 2021). Wearable technology started differently in the middle of the last century than it is today. Sony made its first use of this wearable technology in 1955 when it made a transistor radio (Egeli and Kurgun 2021). Moreover, the early seventies saw the production of the first wearable computer of this era (Chiang et al. 2021). Perhaps, the idea of a wearable computer was raised in the seventeenth century, but the focus was on it in the last century. Different versions of this wearable device were created in the sixties and seventies of the last century. However, it was a limited range that relied on many other components in order to function properly, therefore it has been considered a non-wearable device (Ancillao et al. 2018). In the year 1977, in particular, the idea of creating an electronic vest as a wearable device was put forward in order to help the blind determine directions and facilitate the process of walking (Petit et al. 2019). Wearable technology is becoming more general and convenient by integrating mission-specific devices with more general purpose devices (Luczak et al. 2020).

In the modern age, one of the most pressing challenges for scientists and researchers is wearable technology, and many companies are working on various initiatives using it (Tavakoli et al. 2020). There are several technical items that may

be worn as accessories, including rings, medical equipment, shoes, clothes, and more. This study reveals intriguing information about wearables consumers whose decisions are greatly impacted by outside forces as well as attitude and belief components in the market (Gaur et al. 2019). Additionally, stakeholders decide to utilize the wearables as long as they have a favorable attitude toward their purchasing behavior and a favorable belief regarding the utilization of wearable technology. Through the use of an integrated model, this study also discovered other repercussions and antecedents outside of the realm of conventional theories of technological acceptance. The findings showed that user type and cultural variations had a moderating influence on behavior intention to utilize wearable technology. Thus, this study seeks to help the researchers and scientists to understand and incorporate the features that will lead to achieving the adoption and use of wearable devices for health, business, and education. Moreover, this study has proven that the user of wearable devices can provide a novel service quality to the stakeholders. Therefore, this chapter stimulates to the adoption of this wearable technology because of its effects on the growth of business, medical science, and education.

5   Customers' Intention of Using New Channels

The search process is a significant component of customers' online shopping behavior (Seock and Norton 2007; Lee and Shin 2014; Gao et al. 2015). Previous studies explain that when customers like using a new product or service, they seek information about this product or service in online channels. When customers do not have enough information, they will continue the search. But if they have enough information, they will seek additional information and need to compare those choices of products or services (Koo et al. 2008). Therefore, customers are affected by what others have said (Laudon and Traver 2009). If the review was positive, it will give a positive impression (Bigné-Alcañiz et al. 2008). However, if a review was negative, it will give a negative impression. Technical issues of social commerce platforms and informational and emotional support are critical elements of customers' intentions towards the use of e-commerce. This depends on the website itself, in terms of the nature of design, arrangement, and level of security at this website. To explain these issues, first, we can say that potential customers choose websites over others because there are a lot of customers who reviewed and shared more positive information about a successful experience with the products or services. There are a lot of websites that required registering before the search process and putting reviews or comments about products or services. It also depends on policy responding to comments of customers and showing the unclear point of customers. In this regard, the researchers confirm that the pre-purchase process (which includes product investigation), is most important and dangerous for the company (Seock and Norton 2007). Because this stage creates the primary impression for the potential customer about the product, which leads to the formation of intention in his mind. Therefore the companies must be assiduous in creating good impression on potential customers about their products.

6 Discussion

This chapter started from a set of basic points about the process of measuring the total impact of negative and positive eWOM about the products offered by companies. How this leads to the formation of intentions among consumers to try new channels is done based on the nature of consumers' perceived crowding on products and how they interpret eWOM. This chapter found that there is a clear impact of the eWOM by customers in the intentions of consumers toward trying new channels for companies where we found many studies confirming this result (Basuroy et al. 2003; Park, and Jeon 2018; Sparks and Browning 2011; Litvin et al. 2008; Vermeulen and Seegers 2009; Chen et al. 2011). It is worth noting that this practical application is consistent with the **Social Impact Theory** developed by Bibb Latané in 1981. Where this theory is based on four main rules, one of these rules is a large number of participants about one opinion or one idea, which leads to an effective influence on others. This applies to the perceived crowding by the potential consumer in the field of our study. This theory shows that experienced individuals have a great role in influencing others to change their convictions. Therefore, positive eWOM had clear importance in directing potential consumers to go toward what they imagined of crowding toward the positives in those products on websites and various channels. This supports what studies (Goldsmith and Horowitz 2006; Liu 2006) indicated that positive eWOM had the most prominent role in creating a positive situation and a sense of reassurance by the consumer toward Internet sites. Also, positive eWOM will lead to positive behavior and good experiences, both at the individual and collective levels.

On the other hand, negative eWOM had negative effects on consumers' attitudes and intentions (Chevalier and Mayzlin 2006; Noort and Willemsen 2012). The results of the study showed that both positive and negative eWOM had an impact on consumers' intentions. To clarify the nature of these differences, it is important to highlight the indicators with a high level of influence and for each gender independently. About negative eWOM, we see that females are affected by the aesthetic and formal aspects of the product and are always looking for the added value of these products compared to other products that they have tried. Where the value index was high, as a result of the high impact of negative reactions on women regarding the value of the product. On the other hand, the study found that females are very concerned about failing to order properly. This is because females usually shop for multiple things from different brands, which leads to failures in processing. It also became clear in the results of the study that females tend to deal with high flexibility on the Internet and always stay away from mishandling dealings that are characterized by severity and not taking into account the possibility of reconsidering the processing of a specific order or the possibility of returning or replacing a specific product. The study showed that many females focus on consumers' eWOM to how companies' websites deal with them, concerning the time of response to the call, the time of processing, or the possibility of changing some items of the order. It is also important to say that the study found that females are greatly affected by the

warnings issued by others on corporate platforms. Therefore, customers check the company's website information for their own protection (Lim and Dubinsky 2004).

Concerning males, the study showed that males are less affected than females by negative eWOM about products. But, the most noticeable effect on males lies in some aspects, including the core functionalities of the product. This shows that males usually look for the main content of the product in terms of quality characteristics, which are at the forefront of durability and repairability. This may be due to the nature of the materials that males are accustomed to buying and relating to work machines and others. Our study also revealed that males are very interested in the fees for shipping charges, as this is attributed to the geographical area in which the product is sold or to its nature in terms of size, weight, and other aspects in it. On the other hand, our study also showed that females are affected more than males by positive eWOM. In this context, the results of the study showed that females are affected by the determinants set by the study at different rates. But it is important to stand on the most prominent effect on females. Females want to see what is mentioned about the aesthetic aspects of the product, and it enhances the ideas and beliefs that they have about the proposed product. Females are interested in comments that support luxury or famous brands. Positive eWOM affects the creation of intentions toward trying the best brands supported by positive opinions. The study also showed the important role of reactions about the technical aspects of the product and how this leads to the perception of crowded opinions about the importance of the technical characteristics of the product capable of achieving customer requirements.

As for males, the study revealed that there is a clear effect of positive eWOM in the perception of crowding around the product by the potential customer. Concerning the company's helping, the results of the study showed that males are very interested in the support and assistance provided by companies about the products offered. This helps to get to know the product better. Therefore, we find that males are greatly affected by the amount of assistance shown by the company. The aspects of eWOM about technical aspects have a significant impact on potential male consumers. Males are affected by what is said about, whether the product is specified only on the Internet. Additionally, perceived persuasiveness, source expertise, and source trustworthiness significantly predict eWOM credibility on websites. This study confirms the significant role that eWOM plays in influencing purchase intentions and reputation.

7 Theoretical Contributions

This study made several new theoretical contributions. Firstly, it explored potential consumers' intentions about trying new channels through the perceptions that they generate resulting from the positive and negative eWOM by experienced customers. This agrees with the recent research trends, which calls for more research and investigation of the reactions generated by customers and how they will affect potential consumers. Some studies have only tested the effect of eWOM on influencing

consumers' intentions, and other studies have only tested the role of perceived crowding in influencing consumers' intentions (Machleit et al. 2000). Therefore, our study came to integrate these two perspectives and show a very clear picture of the effect of both positive and negative eWOM on the purchasing intentions of potential consumers toward trying new marketing channels.

Second, being submissive behind eWOM differs between males and females. Each of them has their own emotions and feelings. This was confirmed by the results of the study, which found that there are determinants that significantly negatively affect females, while they do not affect males of the same size. Third, this study can be considered an important source for future research in the field of spoilers. Thus, the study indicated the importance of studying the positive aspects and identifying their impact on potential consumers. It is evident from the results of our study the extent of the influence of such people on the purchase intentions of consumers. Fourth, the result of our study is to answer the intersections and differences in the visions and perceptions between researchers. Some believe that positive eWOM is more influential on potential consumers (Goldsmith and Horowitz 2006; Liu 2006; Duan et al. 2008). This reflects positively on the company's ability to achieve sustainability in success and provide better future opportunities. On the other hand, some believe that negative reactions are the most influential (Chevalier and Mayzlin 2006; Noort and Willemsen 2012).

8   Managerial Contributions

Practically speaking, the results of the current study have made some useful contributions related to building the intentions of the potential consumer in e-commerce. The importance of these determinants on both the positive and negative levels is evident from the reactions generated by individuals on the websites of companies which was measured at the level of males and females individually. Therefore, the results of the study found that there are important indicators that affected the intentions of potential consumers (both positively and negatively), which must be addressed and disposed or reinforced.

Repeating negative eWOM about the low level of value in the product has significant repercussions in the formation of negative intentions about the product by females thus, going toward trying new marketing channels for other brands. Therefore, it is important for the company to pay great attention to responding to such eWOM, and to reinforce its responses usually with illustrated experiences about the product, which give sufficient conviction to the consumer that the words put forward by the customer are incorrect. Females are greatly affected by negative eWOM from customers about not properly processing orders, including errors that occur in the number and type of materials shipped to the customer, as well as errors in listing customers' addresses (shipping errors). Therefore, companies should be interested in seriously considering their contract with reputable transport companies which completely refutes what is said about it. Also, one of the important matters that

emerged from the results of the study is that females are affected by the eWOM to mistreatment by others and always want to go to sites with high flexibility transactions. This requires companies to allocate individuals with high flexibility in dealing. They have sufficient experience to manage dialogue and persuasion.

As for the negative reactions affecting males, the study has found that males are affected by negative eWOM to the core functionalities of the product and try to search again to obtain more accurate information about it. Therefore, companies should be interested in sending videos about the use of products to everyone who wants them. Likewise, conduct interviews with users of those products and display them on their official websites. On the other hand, the results of our study showed that males are affected by negative eWOM about the costs of shipping charges, and they try to obtain products with the same characteristics, but with lower shipping charges compared to similar ones. This requires companies to clearly explain the advantages and methods of shipping for them compared to other companies. Generally, companies should operate under the style of e-commerce which would like to address the weaknesses mentioned above: to pay attention to the technical aspects of their websites; to be more able to interact with customers. This is done by integrating more information support functions on their websites. For example, through the live chat session, users will be able to get live information to enable them to solve the problem. Besides, it is important to integrate online forums within the website that users can post some questions to be answered either by the service provider or by other users in the online community. In addition, it is also necessary to form online chat groups that users can get advice, suggestions, and solutions to their problems. Finally, useful information on solutions to common problems can be submitted, in the form of a video or animation, which will make it easier for users to access the information they need.

As for the positive reactions, the study showed that their effect was greater on females compared to males where the results of the study showed that females are affected by positive eWOM about the aesthetic aspects of the product, which usually mimic the emotions of females. This matter needs to be further reinforced by companies. The written feedback shows the level of assertion by companies about the product. As for the visual, it greatly enhances the importance of the role that the product plays in female self-confidence. Females are affected by positive eWOM about a good brand. The stability of the brand in the mind of the customer results from the credibility of the company. Therefore, companies need to develop new work mechanisms. The forefront of these mechanisms is to listen to the customers and know what they desire and aspire to obtain by conducting surveys and focus groups as well as placing a special window on the company's website that is concerned only with the developmental aspects of the product and to take care of customers' opinions and suggestions.

As for males, the study showed that males are affected by positive eWOM about the product, especially concerning the company's ability to assist, whether at the level of additional services or after-sales services. Companies need to develop themselves in this field by relying on competent individuals with multiple knowledge who can solve customers' problems, answer their questions, and work to solve them. Individuals are

affected by eWOM about the technical aspects of the product and need to know all aspects of the technology used in that product. They welcome talking about positive experiences that give a good impression about that product. To further enhance this, companies need to clarify the functionality and features of the product or services. Advertisements should focus on explaining how to solve problems with the product or services rather than just showing how to use them.

In order to reinforce all the points mentioned, either at the male or female level, companies must create a sense of a human touch in their interactions with them. In addition to ensuring a warm contact at all times, firms should also use proper methods of communication to make a good impression. Companies should pay more attention in focusing their attention on listening sympathetically to the feelings of users through various communication channels such as online chat, e-mails, hotlines, help desk, video chat, forums, and so on. Friendly words of welcome and politeness in responding to users' questions and inquiries are among the ways to establish a warm connection which leads to the involvement of real agents rather than avatars or virtual agents to portray the human touch of communication. Another way to promote warm communication and interactions is to organize live video chats via Skype, Google Hangouts, Tango, or Peer where users can interact face to face with sellers in real time. In addition, chat applications such as WhatsApp, WeChat, Line, KakaoTalk, Telegram can also be used to enhance interactions between users and sellers. Finally, to promote more direct interactions between users and sellers, competitions can be held for users to participate in with the employees of the seller's company. Through teamwork activities or partnerships, users will feel that they are in a warm and friendly connection with vendors by exchanging information and experiences.

9   Conclusion

Online social networks and social commerce both rely on the Internet to function. The gap established by face-to-face connection and the Internet frequently forces people to draw from the experiences of others to build their own. Users regularly turn to the Internet as a source of information and place their trust in unidentified parties based on ratings, comments made in forums and communities, and personal recommendations. One of the most popular ways to learn more about goods or services on the web is through ratings. Online reviews on social media platforms have a significant role in helping consumers make decisions. However, it might be challenging for customers to believe the reviews on shopping platforms because sellers may offer false material, such as erroneous descriptions or phony comments. Due to the fact that users of social networks are friends or distant acquaintances, this restriction may be eased by employing social network shopping platforms. Each business, organization, or transaction can be rated with stars on a service like Facebook or Twitter in addition to receiving written feedback.

Customers who have purchased the goods are frequently the ones who create these ratings and evaluations, giving them the opportunity to voice their preferences.

Additionally, this gives customers some certainty regarding which products to buy. As a result, we assume that people's trust in ratings and reviews will improve confidence in the social commerce. People can interact socially about a good or service in online forums and communities. Online discussion boards encourage interpersonal communication and frequently assist in providing users with answers to their questions. Existing social commerce users may provide information that may aid new users in choosing the best product to buy. Members of these groups frequently assist one another by disseminating information that appears accurate and objective.

Users of online social networks will ask friends or connected users in their network for their comments. Consumers share their individual shopping experiences, which help them decide what to buy. The degree to which an advice is considered pertinent, reliable, and beneficial determines how good it is. Social media may have isolated users and communities, but it also has incredibly connected parts where people are constantly exchanging information and building trust. Users can focus on the proper brand, products, or functions with the aid of interpersonal recommendations, which assist users to handle the deluge of information offered. Additionally, previous research has demonstrated that suggestions have a favorable effect on trust in social commerce.

References

Ancillao A, Tedesco S, Barton J, O'Flynn B (2018) Indirect measurement of ground reaction forces and moments by means of wearable inertial sensors: a systematic review. Sensors 18(8):2564

Ashfaq M, Yun J, Yu S (2021) My smart speaker is cool! perceived coolness, perceived values, and users' attitude toward smart speakers. Int J Hum-Comput Int 37(6):560–573

Attar RW, Shanmugam M, Hajli N (2021) Investigating the antecedents of e-commerce satisfaction in social commerce context. Br Food J 123(3):849–868

Basuroy S, Chatterjee S, Ravid SA (2003) How critical are critical reviews? The box office effects of film critics, star power, and budgets. J Mark 67(4):103–117

Bigné-Alcañiz E, Ruiz-Mafé C, Aldás-Manzano J, Sanz-Blas S (2008) Influence of online shopping information dependency and innovativeness on internet shopping adoption. Online Inf Rev 32(5):648–667

Cappiello A (2020) The digital (r)evolution of insurance business models. Am J Econ Bus Adm 12(1):1–13

Chandrasekaran R, Katthula V, Moustakas E (2021) Too old for technology? Use of wearable healthcare devices by older adults and their willingness to share health data with providers. Health Informatics J 27(4):14604582211058072

Chang HH, Wu LH (2014) An examination of negative e-WOM adoption: brand commitment as a moderator. Decis Support Syst 59:206–218

Chen Y, Wang Q, Xie J (2011) Online social interactions: a natural experiment on word of mouth versus observational learning. J Mark Res 48(2):238–254

Chen Z, Lurie NH (2013) Temporal contiguity and negativity bias in the impact of online word of mouth. J Mark Res 50(4):463–476

Cheng X, Gu Y, Shen J (2019) An integrated view of particularized trust in social commerce: an empirical investigation. Int J Inf Manage 45:1–12

Chevalier JA, Mayzlin D (2006) The effect of word of mouth on sales: online book reviews. J Mark Res 43(3):345–354

Chiang IY, Lin PH, Kreifeldt JG, Lin R (2021) From theory to practice: an adaptive development of design education. Educ Sci 11(11):673

Colley A, Pfleging B, Alt F, Häkkilä J (2020) Exploring public wearable display of wellness tracker data. Int J Hum Comput Stud 138:102408

Duan W, Gu B, Whinston AB (2008) The dynamics of online word-of-mouth and product sales—An empirical investigation of the movie industry. J Retail 84(2):233–242

Egeli GZ, Kurgun H (2021) Wearable technologies: Kinesthetic dimension in enriching tourist experience. University of South Florida M3 Center Publishing, 18(9781732127586), 4

Eroglu S, Machleit KA, Barr TF (2005) Perceived retail crowding and shopping satisfaction: the role of shopping value. J Bus Res 58:1146–1153

Gao G, Greenwood BN, Agarwal R, McCullough JS (2015) Vocal minority and silent majority. MIS Q 39(3):565–590

Gaur B, Shukla VK, Verma A (2019, April) Strengthening people analytics through wearable IOT device for real-time data collection. In 2019 international conference on automation, computational and technology management (ICACTM). IEEE, pp 555–560

Goldsmith RE, Horowitz D (2006) Measuring motivations for online opinion seeking. J Interact Advert 6(2):2–14

Hammouri Q, Abu-Shanab E (2017, May) The antecedents of trust in social commerce. In 2017 8th international conference on information technology (ICIT). IEEE, pp 648–652

Hassan M, Iqbal Z, Khanum B (2018) The role of trust and social presence in social commerce purchase intention. Pak J Commer Soc Sci (PJCSS) 12(1):111–135

Hew JJ, Lee VH, Ooi KB, Lin B (2016) Mobile social commerce: the booster for brand loyalty? Comput Hum Behav 59(1):142–154

Koo DM, Kim JJ, Lee SH (2008) Personal values as underlying motives of shopping online. Asia Pac J Mark Logist 20(2):156–173

Koydemir HC, Ozcan A (2018) Wearable and implantable sensors for biomedical applications. Annu Rev Anal Chem 11(1):127–146

Laudon KC, Traver CG (2009) E-commerce business. Technology. Society, 5th edition, Prentice Hall, New Jersey

Lee EJ, Shin SY (2014) When do consumers buy online product reviews? Effects of review quality, product type, and reviewer's photo. Comput Hum Behav 31:356–366

Leong LY, Hew TS, Ooi KB, Chong AYL (2020) Predicting the antecedents of trust in social commerce–A hybrid structural equation modeling with neural network approach. J Bus Res 110:24–40

Lim H, Dubinsky AJ (2004) Consumers' perceptions of e-shopping characteristics: an expectancy-value approach. J Serv Mark 18(6):500–513

Litvin SW, Goldsmith RE, Pan B (2008) Electronic word-of-mouth in hospitality and tourism management. Tour Manage 29(3):458–468

Liu Y (2006) Word of mouth for movies: its dynamics and impact on box office revenue. J Mark 70(3):74–89

Loncar-Turukalo T, Zdravevski E, da Silva JM, Chouvarda I, Trajkovik V (2019) Literature on wearable technology for connected health: scoping review of research trends, advances, and barriers. J Med Internet Res 21(9):e14017

Lu Y, Zhao L, Wang B (2010) From virtual community members to C2C e-commerce buyers: trust in virtual communities and its effect on consumers' purchase intention. Electron Commerce Res Appl 9(4):346–360

Luczak T, Burch R, Lewis E, Chander H, Ball J (2020) State-of-the-art review of athletic wearable technology: what 113 strength and conditioning coaches and athletic trainers from the USA said about technology in sports. Int J Sports Sci Coach 15(1):26–40

Machleit KA, Eroglu SA, Mantel SP (2000) Perceived retail crowding and shopping satisfaction: what modifies this relationship? J Consum Psychol 9(1):29–42

McGrew PL (1970) Social and spatial density effects on spacing behaviour in preschool children. J Child Psychol & Psychiat 11(3):197–205

Park HH, Jeon JO (2018) The impact of mixed eWOM sequence on brand attitude change: cross-cultural differences. Int Mark Rev 35(3):390–411

Petit O, Velasco C, Spence C (2019) Digital sensory marketing: integrating new technologies into multisensory online experience. J Interact Mark 45:42–61

Seock YK, Norton M (2007) Attitude toward internet web sites, online information search, and channel choices for purchasing. J Fash Mark Manag 11(4):571–586

Sharifi A, Khavarian-Garmsir AR, Kummitha RKR (2021) Contributions of smart city solutions and technologies to resilience against the COVID-19 pandemic: a literature review. Sustainability 13(14):8018

Sharma S, Menard P, Mutchler LA (2019) Who to trust? Applying trust to social commerce. J Comput Inf Syst 59(1):32–42

Sovacool BK, Del Rio DDF (2020) Smart home technologies in Europe: a critical review of concepts, benefits, risks and policies. Renew Sustain Energy Rev 120:109663

Sparks BA, Browning V (2011) The impact of online reviews on hotel booking intentions and perception of trust. Tour Manage 32(6):1310–1323

Tavakoli M, Carriere J, Torabi A (2020) Robotics, smart wearable technologies, and autonomous intelligent systems for healthcare during the COVID-19 pandemic: an analysis of the state of the art and future vision. Advanced Intelligent Systems 2(7):2000071

Turban E, Bolloju N, Liang TP (2010) Social commerce: an e-commerce perspective. In Proceedings of the 12th international conference on electronic commerce: roadmap for the future of electronic business, Honolulu, United States of America, pp 33–42

Utz S, Kerkhof P, Van Den Bos J (2012) Consumers rule: how consumer reviews influence perceived trustworthiness of online stores. Electron Commerce Res Appl 11(1):49–58

Van Noort G, Willemsen LM (2012) Online damage control: the effects of proactive versus reactive webcare interventions in consumer-generated and brand-generated platforms. J Interact Mark 26(3):131–140

Vermeulen IE, Seegers D (2009) Tried and tested: the impact of online hotel reviews on consumer consideration. Tour Manage 30(1):123–127

Wang X (2011) The effect of inconsistent word-of-mouth during the service encounter. J Serv Mark 25(4):252–259

Yadav MS, De Valck K, Hennig-Thurau T, Hoffman DL, Spann M (2013) Social commerce: a contingency framework for assessing marketing potential. J Interact Mark 27(4):311–323

Zhang KZ, Benyoucef M (2016) Consumer behavior in social commerce: a literature review. Decis Support Syst 86:95–108

Zhang KZ, Benyoucef M, Zhao SJ (2015) Consumer participation and gender differences on companies' microblogs: a brand attachment process perspective. Comput Hum Behav 44(1):357–368

Raed Khamis Alharbi is a lecturer at the Department of Finance, Majmaah University, Al Majmaah 11952, Saudi Arabia. He earned his doctoral degree in Islamic Finance from the Universiti Sains Malaysia in Malaysia. He earned his master's degree in Finance from Flinders University in Australia. He can be reached at raedalharbi7@yahoo.com.

Ghufran Alsaker is a lecturer at the Management Technical College, Southern Technical University, Basrah, Iraq. Alsaker received his MBA from the Southern Technical University, Basrah. Alsaker's research interests lie on Administration Studies. Alsaker is a reviewer and published papers in many journals.

Noor Azira Binti Rushar Haimi is an assistant lecturer at the School of Management, Universiti Sains Malaysia, Penang, Malaysia. She published many papers in different journals. She

is a reviewer for many journals. She works in different industries. She can be reached at azira9968@gmail.com.

Alhamdi Mohammed is a PhD student at the Faculty of Accountancy, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia. He published many papers in high-impact journals. He is a reviewer for several journals. He can be reached at mohsabah91@gmail.com.

Mobile Payment Technology

Mohammed Faris and Mohd Nazri Mahmud

1 Introduction

Humans employed different forms of payment systems throughout history to get good services. They begin to employ many things such as animals, grain, shells, metal coins, pieces of white deerskin, the wampum, gold, charge cards, credit cards, the U.S. dollar, and, most recently, computerized payments, starting with the bartering system. People prefer straightforward, transactional purchases if there is one invariant in the development of payments. These attitudes started to acquire form with the development of the charge card in the early twentieth century. Despite being described by Edward Bellamy in 1887's "Looking Backward", the first charge card was not introduced until 1921 when Western Union clients received a charge card. Customers were soon offered charge cards by department stores, gas stations, and motels, allowing them to avoid going to their local banks. In 1950, the first step in the introduction of what we use and know today was called the credit card by utilising the diners' club card. The Bank America card was the first modern-day credit card issued by a third-party bank, launched in 1958. The payment system disclosure claims the rise in demand for the card, which was used before it changed to Visa in the 1970s. In 1994, the bank introduced a new service known as online banking and bill payment in response to the revelation of the bank's payment system growth. This advancement did not stop there; in 1997, mobile web payment was introduced, which was more advanced according to the invitation of IoT (Internet of Things) in 2000. Mobile phones are no longer exclusively used for communication. We even use our mobile devices to make routine purchases in stores, on websites, and through applications.

Mobile payments are made using a mobile credit card or a mobile wallet, both of which are stored on a mobile application. To make a purchase, a consumer who

M. Faris (✉) · M. N. Mahmud
School of Electrical and Electronic Engineering, Universiti Sains Malaysia,
14300 Nibong Tebal, Malaysia
e-mail: Muhmed@student.usm.my

utilizes mobile payments just scans his/her mobile device over a merchant's POS terminal rather than pulling out a credit card or scanning a debit card and entering a private identifying number (PIN) (Dahlberg et al. 2003). Shopping is simpler, quicker, and more secure when you use mobile banking. Despite its growing popularity in other countries, the United States has been slow to embrace this technology. In 2009, Japan produced $22 billion in contactless payments, while the United States produced $1.5 billion (Hayashi 2012). Despite the fact that the percentage of Americans using mobile banking is expanding, only 15% of smartphone users said they had made a mobile payment in the previous year (Federal 2013). The study showed that 87% of the American population has a smartphone and 15% of those use this smartphone for paying bills. According to the survey, which was conducted over 12 months, the use of mobile payment in the United States indicated that 13% of the American population used the feature of mobile payment while only 6% used the POS (point of sale). Citizens under the age of 44, many with higher incomes, and ethnicities were the most likely to use mobile payments, though these disparities may be closing (Federal 2013). (Rogers 2010) divided individuals who embrace innovative technologies into five groups established on his approach of creation diffusion: developers (2.5%), prematurely adopters (13.5%), prematurely prevalence (34%), late maturity (34%), and stragglers (3.5%). According to this supposition, the gauged 13% of Americans who employed mobile payments in 2012 were early adopters and creators. According to Rogers (2010), instruction was a fundamental differentiator, as those with more significant instruction statuses were more possible to be architects or early adopters. The authors used studies on digital banking uptake as a guiding principle in order to construct a model. (Rogers 2010) divided individuals who embrace innovative technologies into five groups based on his innovation dissemination principle: entrepreneurs (2.5%), early adopters (13.5%), early majority (34%), late majority (34%), and laggards (3.5%) (16%). According to this view, the estimated 13% of Americans who utilized digital purchasing in 2012 were early adopters and innovators. According to Rogers (2010), –e-learning was a crucial factor, since people of higher education were less probably for being inventors or early investors. The authors utilized investigations on online banking uptake as an issue of consideration to create a model. Despite the functional distinctions between online banking (billing and account management) and mobile payments (investments created through the smartphone), the history of online payments banking may be used to track money transfer patterns and user characteristics. In 1998, around 7% of the population in the United States used internet banking, with usage anticipated to rise to 35% by 2004 (Bell et al. 2009). According to studies Lassar et al. (2005), payment is a considerable essential demographic aspect pushing internet banking use. (Kolodinsky et al. 2004) found a relationship between age, education, earnings, and net worth and the intention-to-use online banking in the coming year. Although the consequence was insignificant and the data did not deliver a presentation of the foundation, this research reveals a link between economic management and online banking activity (Hogarth and Anguelov 2004). Although contemporary data imply that the use of mobile banking assistance is expanding, especially among smartphone owners, there is little information on mobile banking behavior (Federal 2013).

This is consistent with an additional contemporary (Federal 2013) analysis, which identifies amenity as the key motivation for using mobile payments, mentioning security crises and a lack of appropriate tools, such as a smartphone, as major deterrents. While there has been researching on the reasons that encourage people to accept and use mobile payment systems, less is comprehended about how mobile payment affects purchasing habits. Mobile payments hold existed singled out in studies on spending behavior as a possible factor in impulsive purchases. These studies tend to stress the advantages of mobile payments for retailers, framing these services as a way to increase customer impulsive buying (Alliance 2008). Mallat and Tuunainen (2008) predicted as mobile payments become more prevalent, impulsive purchases will rise. From the standpoint of the consumer, mobile payments have been marketed as their convenience, with small consideration given the possible disadvantage of greater impulse purchasing. Consumers may utilize their smart phone to pay for items and services they want (usually smartphones or tablets). Consumers create economic payments and cash transfers by transmitting settlement instructions to banks and commercial institutions directly or indirectly via smart phones, the Web, or proximity sensing (near-field communication). Application producers and financial organizations can achieve economic services through the Internet by supporting mobile payments for money and enabling terminal devices (Gerpott and Meinert 2017). Credit cards, membership cards, transportation tickets, and other types of mobile payments can be made to a mobile terminal, thereby turning the phone into a digital wallet (Wang et al. 2019). Mobile terminals, because of technological improvements, allow superior mobility and customized services. This frees customers from having to go to certain areas to do business and removes geographical limitations on business locations (Pauluzzo and Geretto 2018).

Traditional manual operations have been replaced by the interaction of a portable communication terminal with an Internet medium, so digital banking is less limited by the working hours of eligible financial institutions and enterprises, and a continuous 24-h commercial service is now conceivable. Mobile payments, on either side, they are precise, do not require any adjustments, and provide rate, multi-functionality, all-weather service, and access to insecure connections. Micropayments are tiny online payments (Huang 2017). The system requirements for this type of mobile payment method are unique. Less information transfer is necessary to meet certain security standards, while network speed and efficiency require less administration and storage (Du 2018). Micropayments are transactions of less than ten dollars that typically entail the purchase of smartphone services like gaming, movie streaming, and other similar stuff. Macro-payment is another way to pay using your phone (also known as stander payment). The transaction amounts are often significant, in the hundreds of dollars (Yen et al. 2014). The protocol structure and transaction stages are more difficult to secure, and a significant variety of public key technologies are used. The level of security standards differs between the two payment options. For micropayment methods, for example, purchase authentication by a respected commercial bank is required, but for payment processing, the bank's SIM card authentication mechanism suffices (Fan et al. 2018).

In contrast to previous mobile payment studies (Al-Saedi et al. 2020), IJBM and artificial neural networks (ANN) rely on a single-stage data analysis technique known as structural equation modelling (SEM). Because a single-stage-based SEM methodology could only analyse the straight connections between elements in the research model, a hybrid SEM-ANN strategy was used (Sim et al. 2014). The SEM is insufficient in this situation to predict the complicated decision-making mechanism in practice. As a result, the implementation of a hybrid SEM-ANN methodology is thought to offer significant methodological value to the current research and aid in understanding the drivers impacting the long-term use of mobile payment contactless methods in the real world. A study by (Ooi and Tan 2016) proposes a new mobile technology acceptance model (MTAM), which comprises mobile usefulness (MU) and mobile ease of use (MEU) in order to evaluate the implementation of SCC. Additional mobile constructs, such as mobile perceived security risk (MPSR), mobile perceived trust (MPT), mobile perceived compatibility (MPC), and mobile perceived financial resources (MPFR), were incorporated into the frugal MTAM to account for the complexity that exists in the mobile environment. The integrated model, which was evaluated using a partial least square-structural equation modelling-artificial neural network (PLS-SEM-ANN) and when implemented to 459 smartphone subscribers via a questionnaire, it has a novel influence and possibly a new research methodological paradigm because it can capture both linear and non-linear correlations. While the model validates the importance of MU in MTAM, MEU deserves more attention in reality. In this study, just three of the presented hypotheses were judged to be of non-importance, suggesting that they should be further studied. The work contributes to the academic community by introducing new mobile constructs that integrate MTAM and SCC to evaluate the likelihood of mobile users adopting SCC. The research includes a number of significant managerial implications that might be extended to mobile studies in other industries such as transportation, hotels, banking, and tourism.

(Liébana-Cabanillas et al. 2018) create a novel methodological approach for predicting most important aspects that influence whether to use mobile payments. The authors conducted an internet study of a nationwide sample of Spanish mobile phone subscribers for this purpose. The researchers utilized two techniques: first, structural equation modelling (SEM) was applied to determine whether variables have a major influence on the acceptability of mobile payments; and second, a neural network model was utilized to evaluate the relative relevance of the SEM identified key factors. The most important elements impacting the intention to implement in this study were evaluated utility and potential security characteristics. On the other hand, the results of neural network analysis validated many SEM conclusions while also revealing a somewhat different sequence of major predictive effects. (Sharma and Sharma 2019) combined structural equation modelling and neural network analysis in a two-staged method of analysis. The outcomes show that motivation and desire to use are both important antecedents to current consumption and that motivation mediates the link among quality of service, quality of information, and confidence with the desire to apply mobile banking, whereas system quality has no effect. The conceptual and operational implications of the conclusions have been examined.

(Leong et al. 2020) addressed this gap by identifying the problems and issues with mobile wallet innovation adoption from the standpoint of innovation resistance theory (IRT). We effectively expanded the IRT by incorporating socio-demographics and perceived novelty using a two-staged structural equation of high complexity modelling-artificial neural network (SEM-ANN) technique. The research revealed no compensatory or regressive connections found between variables and m-wallet resistivity in this study. In SEM, important variables were utilized for input neurons for the ANN model. They identified major effects of education, wealth, utilization barrier, threat barrier, valuation barrier, tradition barrier, and perceived novelty on m-wallet innovation resistance based on the normalized significance generated by the multiple hidden layers of the feed-forward-back-propagation ANN algorithm. The ANN model can estimate m-wallet innovation resistance with a 76.4% prediction accuracy. We also discussed some novel and positive conceptual and applied implications towards reducing consumer resistance to mobile wallet technologies. Hidayat-ur-Rehman et al. (2022) used innovation theory as the foundation of their research to create a model dedicated and identified the successful aspects of using the mobile wallet, such as ease, perceived risks, personal innovation, and faith in SEM-ANN. The primary factors of intention-to-use were first identified using partial least squares-structural equation modelling (PLS-SEM). Second, the ANN approach was used to provide the PLS-SEM results more resilience and to assess the relative importance of the SEM-based important determinants. Based on their investigation, compatibility, ease of use, observability, convenience, relative advantage, facilitating conditions, apparent trust, and risk perception are the major factors that influence the willingness to use m-wallets. Furthermore, they observed that the most important indicator of intention-to-use is security. The results of ANN corroborated the findings of PLS-SEM, but the order of important items was altered.

Loh et al. (2022) continued that the desire to applied digital banking in the middle of an epidemic is investigated in this study. The cognitive-affective-conative (CAC) structure has been used as a conceptual approach in general. The continuous interconnections between mental and affective categories were derived using a penta-dimensional approach. An online survey of 307 young individuals who utilize digital payments yielded results that were then analysed using structural equation modelling (SEM) and artificial neural networks (ANN). Both affective and emotional elements have a significant influence on continuance intention, and they can operate as mediators between cognitive variables. Surprisingly, cost reductions and the size of the reference network were identified as sources of technology stress. Price reductions should also not be overlooked because of their indirect influence on retention intentions, despite the fact that they have a minor significant effect.

2 Architecture for M-Payments

Figure 1 presents a simplified description of the conceptual model that showed the connections between the factors in mobile payment. The MASP (mobile payment application service provider) provides an important infrastructure (hardware and software) which can function as a connection point that establishes the connection between the bank and the customer that used the phone application payment service (Verkijika and Neneh 2021). The first step allowed the user to use the mobile service payment through registering his account or visa debit number with MASP. At the moment of registration, the MASP collects the customer and merchant's bank account (or debit card) details as well as their active digital certificates. The MASP service was launched once the system checked and verified the account number for clients and merchants and their information such as phone numbers and card numbers through the used digital verification number sent to them. The system ensures that each mobile number is connected to the account for the users (customer and merchant). Customer mobile payment software (mobile wallets) is provided to users and may be located on their smartphones or Memory cards. The mobile wallet connects with the MASP platform to transfer the payment of client to the merchants such as buy things from online shops or tickets fly (Oentoro 2021). Once the client pays from the merchant's online shop, any digital variation code is sent to the client number that connects to his banking account registered on MASP to verify it and send the payment to the merchant's account. When the MASP receives the verification code from the client on the amount of payment for the merchants, the system starts validating the identity of the client once it is finished. The amount is transferred to merchants' accounts; the system sends a digital notification to inform both clients and merchants that the operation is finished. This model might be developed to include interactions between MASP and the financial system, such as interbank payments and settlement.

3 Technologies Used for Mobile Payments

Mobile payments are classified into several types according to the type of mechanism and channel that are used. The research and development of mobile payment networks indicate that there are many factors affecting classifying mobile payments, such as location, payment amount, and security concerns. There are two categories of mobile payment (Perry et al. 2019). The first focus is on the location factor. While security concerns are the first phase of mobile payment categories, payment, time, value, and media can be considered the second phase. The type of cement used is one of the crucial factors to consider in the divided cauterization (Flavián et al. 2020). According to the description before, there are two types of mobile payment: proximity payment and online payment.

1. Online payments: Money transfers from the seller's location to the buyer's location without requiring anybody to relocate. SMS, USSD, UICC, m-ticket, digital
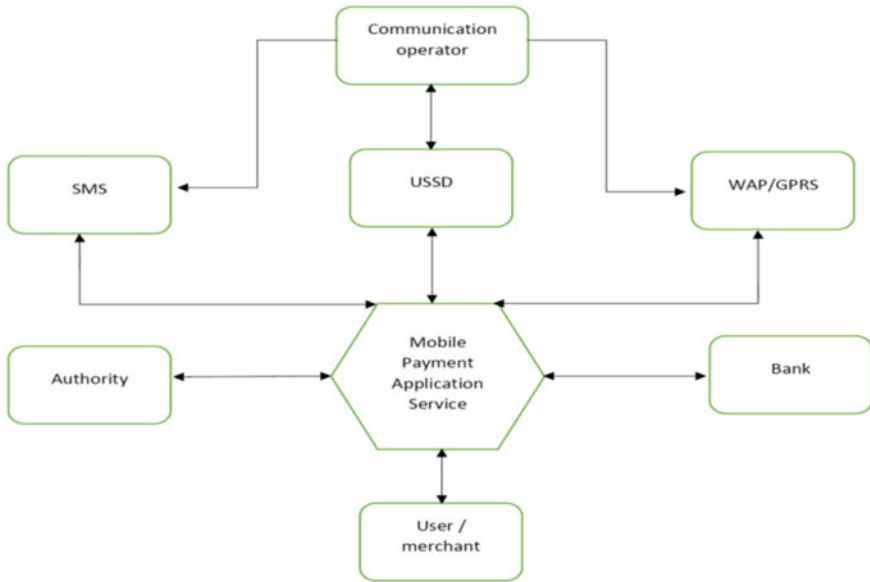
Fig. 1 Mobile payment process

currency, and peer-to-peer payments are just a few examples of online payment methods (Suryaman et al. 2020).

2. Short message service (SMS): This sort of payment is utilized as a communication and payment channel in the digital commerce industry (De Luna et al. 2019). The bank offers an SMS service so that both the client and the merchant can profit. The SMS payment protocol is built using application-based and peer-to-peer (P2P) mechanisms.

3. Application-based: The customer and the bank are notified via SMS through the mobile application, which is called mobile banking. In the first step of this system, both Client and Merchant are registered with their mobile number and account number in the application to receive the verification code through the bank. The bank used two factors in the operation for payment, which are called mobile currency identifiers (MMID) and a mobile personal identification number (MPIN) to enable SMS banking (Qian and Zhen 2018). Using the mobile network operator's SMS gateway, the client composes and sends an SMS to the bank address that includes the merchant's MMID, the client MMID, the amount, and the client mobile number (GSM). This message is 160 characters long and uses the gateway switch to send the payment value between the customer and the merchant across secure SSL/TLS networks.

4. Peer-to-peer (P2P): Its platform provided an SMS-based service for both web and mobile applications and allowed the customer to create their list and the forwarded message form (Liu et al. 2020). This platform allowed sending the message to all recipients in the correspondent list by using an IP link between

the message server and the GSM service provider centre "short message service centre (SMSC)".

5. Unstructured supplementary service data (USSD): This infrastructure functions similarly to the GSM network, allowing mobile banking transactions exclusively in BASIC form on mobile phones (Sumathy and Vipin 2017). They are not obligated to use cellular data. The key benefit of adopting USSD is that the mobile client may connect to the server at any time and from any location. To utilize the USD application platform, the consumer must enter a short code.

6. Interactive voice response (IVR): This allows a user to pay for cargo and assistance given by a merchant using their phone. Users will be permitted to interface with a company's web server via a phone keyboard or voice commands, and then use an IVR conversation to request services (Zaman et al. 2020). IVR is now only accessible in English, however traders will indeed be able to give it in other languages in the near future.

4 Proximity Payments

Purchases are allowed via a smartphone that connects with ATM/PoS machines locally (e.g., via NFC, RFID, IrDA, or Bluetooth). Mobile devices are used to pay for purchases from the net, tolls, vending machines, and other POS products via proximity payments. Near-field communication (NFC) is an approach which enables proximity (short-range) payments between two devices, such as an NFC-enabled smartphone and another NFC reader, NFC tag, or NFC PoS machine. Card emulation and peer-to-peer communication are the three modes in which NFC is primarily used.

1. Reader and writer: an NFC-enabled device (Pos/smartphone) connects with an NFC tag in this product. The essential function of connection is to write or read from or to an NFC tag. It is broken down even into two additional forms: reading and writing. The smartphone is in the reading method that reads the data contained in the NFC tag. However, in the writer's method, data is written into an NFC tag.

2. Card emulation mode: A contactless smart card is emulated by an NFC mobile device in this mode. Most online payments are all done by using this method. An emulated mode is used with contactless smart cards such as debit cards, loyalty cards, and credit cards.

3. P2P method: Any data among all NFC smartphones might be transmitted in this method. Both devices, which have inbuilt power, demand energy when in active mode. Transmission among NFC devices is unidirectional half-duplex in this manner, which means that while one NFC device is transferring data, another must wait and then transfer data once the first has completed.

Bluetooth is a radio transmission mechanism used in technological devices, personal digital assistants (PDAs), cell phones, and laptops. Bluetooth offers new transaction concepts called "proximity payments" by allowing a quick interconnection to devices for mobile banking.

Radio frequency identification (RFID) radio signals are being used to send data among an RFID reader and an electronic RFID tag, which is usually attached towards an item and used for detection and management. RFID wireless signals have varying wavelengths based on the magnetic fields and bandwidth to send data. RFID tags have an embedded electronic chip that can save a limited amount of data and perform simple applications. The embedded device that generates the outgoing signal in active RFID tags has an internal power supply. Active RFID tags are more reliable than passive RFID tags. These tags are more costly and can connect with an RFID reader through a long range of frequencies. Internal power is not required for passive RFID tags. They include an electrical device as well as an antenna. These passive tags are powered by the input waveform on a radio frequency. Based on the planned antenna, length, and radio waves used, transponders may broadcast around 10 feet away (RF).

The usage of mobile devices and personal digital assistants (PDAs) is on the rise, and so is the use of infrared data association (IrDA) ports by customers. With the rapid advancement of technology, user skills are becoming the cornerstone of a new digital payment system that promises to replace the old or standard form of payment. IrFM (infrared financial messaging standard) offers a lot of potential for future digital payment systems.

5   Mobile Payment Protocols

1. ECash is a framework that allows for safe online payments as well as anonymity. C, M, and both customer and seller banks are the three parties involved in the protocol (collectively called E-Bank). E-Bank produces the digital certificate currency, as well as maintains a database of previously employed coins. It uses RSA, a key encryption algorithm with blind authentication, for confidentiality. ECash validates each cash submitted to E-Bank to avoid multiple spending (Chaum and Naor 1988).
2. NetCash is an online system for confidential and encrypted digital money transfers between producers and consumers. C, M, and Currency Server are the participants in the protocol. Customers can sell or purchase electronic checks using the Cash Server, which produces electronic currency for businesses. NetCash employs both symmetric and asymmetric encryption. By verifying currency throughout the payment process, NetCash can protect against fraud and duplicated spending, just like it can with offline transactions. All of these things are possible: security, scalability, acceptability, and interoperability (Medvinsky and Neuman 1993).
3. Secure Electronic Transfer Protocol (SET): In 1996, Bellare and Wang invented SET, a popular credit card payment protocol for wired networks. It has five key components: C, M, I, A, and the certificate authority. Asymmetric and symmetric cryptography is used in SET. SSL and STT are implemented in the protocol. SET authenticates clients and mutually uses X.509v3 standard digital certificates. It uses DES for encryption and RSA digital signatures with SHA-1 for integrity.

The message to be sent is encrypted using a symmetric DES key, which is then encrypted using the RSA public key (asymmetric). For the first time in SET, the dual signature idea is employed to link order information with payment information. SET, on the other hand, needs a significant amount of computation and storage space, making it a lengthy and difficult protocol (Li and Wang 2014).

4. In 2000, Bellare and Garay developed the i-Key System, a credit card-based payment protocol. Then stand for the total number of organizations that have their public key and can make a digital signature. Individual protocols (1KP, 2KP, and 3KP) are created by increasing the value of i. This raises the protocol's intricacy and security strength. C, M, and PG are the three parties involved in the protocol. The protocol employs asymmetric cryptography and is similar to the SET protocol in terms of security strength. For authenticating public keys, the protocol supports a single certificate authority, although it may be extended to multiple certificate authorities. SSL or IPSec are used to protect order information. Because public keys are encrypted and decrypted, the protocol is highly computationally expensive. We only considered $i = 1$ in the study, i.e., iKP (Bellare et al. 2000).

5. Modified Secure Electronic Transfer Protocol (MSET): Shedid created a modified version of the SET protocol called Modified SET, which was universally accepted for mobile payment in 2010. MSET improves performance by reducing cryptographic calculations in SET by switching from asymmetric to symmetric cryptography. SET uses the same entities as MSET and achieves the same security criteria. MSET employs a two-step method to establish a secure channel for communication between organizations. The relevant entities acquire their symmetric keys in the first phase (registration), and payment is completed in the second step (payment) (Shedid and Kouta 2010).

6. Mobile Pay Center Protocol 2 (MPCP2): In 2011, Dizaj et al. created a client-centric private mobile payment mechanism based on symmetric cryptography. The protocol is comprised of four principles: C, M, I, and A, with the customer having total control over the transaction. MPCP2 demonstrated a revolutionary VAM session key agreement technique that was compatible with mobile devices and reduced communication overhead. The protocol was effective in lowering the cost of computing by reducing the number of cryptographic operations. MPCP2 successfully reduced the possibility of a replay attack, employed a digital signature to avoid the issue of repudiation, and provided total payer confidentiality (Dizaj et al. 2011).

7. Secure Lightweight Mobile Payment Protocol (SLMPP): In 2012, Sekhar and Sarvabhatla devised a safe and efficient mobile payment mechanism based on client-centric symmetric cryptography. The protocol has five main principles: C, M, I, A, and PG, with the payer controlling the transaction flow. By adopting symmetric end-to-end encryption, the protocol is able to reduce the number of cryptographic operations. The protocol prevents the payment gateway from defrauding the rest of the organizations and meets all privacy standards (Sekhar and Sarvabhatla 2012).

8. Lightweight Protocol for Mobile Payment (LPMP): In 2012, Tripathi and Ojha developed a web and mobile online payment mechanism for low-end mobile devices based on symmetric key cryptography. By skipping the merchant setup step and using symmetric key operations, LPMP drastically decreases the computational overhead. LPMP is meant to assist in avoiding security threats like Man in the Middle, replay, masquerading, dishonest clients and merchants, and retaining critical transaction attributes (Tripathi and Ojha 2012).

6 Mobile System

A mobile payment system is made up of three components: engaged parties, basic transactions, and payment transactions. These transactions may be described in this section as follows (Kungpisdan 2005, 2009). A customer is a person who wants to purchase goods or activities from a merchant. This party uses a mobile device to purchase items and/or activities from the company. 2) Merchant (M): A merchant is someone who sells products or services. An acquirer is an entity that has access to the trader's credit (accounting organization of the trader). It oversees the merchant's account and provides electronic payment options. An issuer is a person that has access to the customer's wallet (financial services company of the customer). It keeps track of the customer's wallet and makes electronic payment options available. A payment gateway is a third-party service that processes payments on behalf of the issuer (the customer's commercial organization) and the purchaser (the trader's credit institution) are the two financial institutions involved in the transaction. The issuer and the acquirer are represented on the Internet through the payment gateway and the issuer.

This is an exchange between a consumer and a seller in which the customer gives the seller specific instructions to purchase products and/or services on his or her behalf. Debit is the transaction that takes place between the client and the issuer (via the bank transfer). The customer requests that the issuer deduct the money from his account. Credit refers to the exchange of funds between the acquirer and the seller (through the bank transfer). It must be done by the seller in transmitting a desired cash to the seller's card. Payment-clearing is the activity in which the issuer and the acquirer work together to transfer the funds requested by the customer and merchant between their accounts (via the bank transfer). Transfer of Funds A variety of payment protocols (Kungpisdan 2005; Kailar 1996) is dependent on payment transaction data in the next step. The customer will send a payment request to the merchant along with a debit request. The merchant will next make a debit and credit request to the bank transfer. The bank transfer will then manage payment clearance from the issuer to the acquirer. The bank transfer will then send the merchant credit and debit responses, which the merchant will subsequently relay to the customer. The bank transfer will serve as a conduit between the buyer and the seller, as well as between the issuer and the acquirer. As a result, the payment gateway will manage both debit and credit transactions.

7   Mobile Payment Security Issues

As they grow increasingly common, the payments made via mobile devices make these devices more appealing targets for adversaries and attackers. As a result, security is the most significant and important aspect of mobile payments in the area of mobile payments. Trust in mobile commerce applications will be constrained since mobile payments might function in insecure contexts. The application developer for payments via phone should be aware of the significant security and threat models. The following characteristics were considered as security metrics in a research study while developing mobile payment protocols, and they are essential for a developer to produce in an assaulter environment.

Security and Trust: The security and privacy of protected details are part of the major concerns in the implementation of mobile payment systems. Secrecy, identification, integrity, non-repudiation, and authorization are all transaction security objectives that must be met. Economic knowledge sent in an MPS among clients, banking servers, payment gateways, and vendors is never affected. MPS security, privacy, and trust research may be found in (Gao and Waechter 2017; Bojjagani and Sastry 2017; Solat 2017; Ahamad and Pathan 2019).

Wireless public key infrastructure (WPKI/PKI) is a company that verifies customer's information identification over a medium for connection. That happened via a mix of private and public keys generated with the user's identification. A pair of these keys are created using the security algorithms and shared with the certificate authorities (CA). It is important to mention when a public key is linked to a customer's unique identifier. The CA stores those details on a server and issues electronic certification which contains the decryption key or details about the key to confirm the customer's identity. The client, certificate authority, certification system management, PKI directory, and certificate repositories are the aspects of the M-PKI. Studies on the connection among these institutions, as well as when the user obtains a certification from the CA, could be obtained (Yue 2015; Prakasha et al. 2019).

Proxy certificates are certificates that are a normal X.509 public key end-entity certificate that was used to verify the document (Tuecke et al. 2004). Within the PKI-based authentication system, to provide limited proxy permissions and assignment, a proxy identity can be created from another proxy certification. The security considerations associated with using a mobile agent are key concerns for executing activities that their owners must be tied to, such as payments, and are of the highest relevance due to agents' engagement in electronic commerce. The papers are bound using digital signature procedures. This requires the agents to give the host the customer's secret key before approving the papers. As a result, being replicated outside of a secure environment gives attackers access to the customer's secret. To protect against a key attack, agents can use proxy certificates that eliminate the necessity for workers to have access to the customer's private key in order to digitally verify papers (Samadani et al. 2010; Almuairfi et al. 2014).

The basic aim of lightweight cryptography is to offer protection using scant effort. Lightweight cyphers that are reliable, low power, and require few calculations are required for devices with limited resources. A lightweight cypher should have a quick decryption rate and low resource consumption. In lightweight cryptography, a cryptographic approach or method is customized for use in a specific environment, such as RFID tags, UICC/SIM, NFC transactions, mobile banking, sensing, touch smart cards, and public health services (Isaac et al. 2012).

The creation of security protocols, as well as their formal verification, has become important due to the increasing Internet usage, wireless clients, and money transfers which are all on the upswing. Security protocol design is a complicated issue; such protocols must not only be efficient but also meet security objectives. The accuracy and validation of these features are particularly desired since people tend to trust security methods. As an application developer, you must be aware of all attacker activities, including protocol breaches and probable message forging. As a result, standard security assurance is a critical component of their development. The relevant basic, verified investigations may be located in (Ahamad et al. 2017; Bojjagani and Sastry 2017).

Secure electronic transactions/Internet keyed payments (SET/iKP): A group of credit card companies and software companies proposed the SET protocol to secure the authenticity of e-commerce purchases and personal privacy (Isaac and Sherali 2014; Tellez and Zeadally 2017). A secure section of the core processor of a mobile device, PDA, or other associated device is known as the trusted execution environment (TEE). A TEE assures that the customer's confidential data is securely kept, managed, and secured. A TEE's capacity to offer separated secure processing of allowed security applications is known as a "trusted application" (TA) in terms of data access rights, privacy, confidentiality, integrity, and authenticity (Li et al. 2019; Bouazzouni et al. 2018; Fan et al. 2018).

Confidential, identification, the integrity of data, authorization, and non-repudiation are all security criteria for mobile payment systems (Kadhiwal and Zulfiquar 2007). Mobile payment protocols must fulfil the security standards outlined above for end-to-end encryption (Nguyen et al. 2005), and encryption acts a significant role in protecting mobile payments. Decryption technologies are essential for establishing a security solution while utilizing mobile payment systems over insecure connections or in public places. As a result, cryptographic approaches should be included in mobile payment system protocols. The next sections go through the various cryptographic techniques that might be utilized in mobile payment systems.

Symmetric cryptography's goal is to enable the use of the same key for encoding and decoding. To put it another way, the two parties use a single key to share confidential information. The data encryption standard (DES) uses a 56-bit key size; Triple DES uses a 168-bit key size; AES uses a 128–256-bit variable key; IDEA uses a 128-bit size, and Rivest Cipher (RC5) uses a 128–256-bit key size. Asymmetric cryptography uses two separate keys to encrypt and decode data. Each user in the system is given a general key and a personal key. With the receiver's general key, a sender encrypts all sensitive data. Then the receiver decrypts the data using a private key after receiving it. Asymmetric encryption is defined by Ronald Rivest

Shamir Adleman (RSA), elliptic curve cryptography (ECC), the digital signature standard (DSS), and the ElGamal cryptosystem. It is a privacy mechanism that allows a customer to encode visual information before delivering it to a receiver, such as words, images, or graphics. The data is shown as a visual image at the receiver end. Naor and Shami were the first to offer this approach in 1994. In Visual Secret Sharing (VSS), a photograph is divided into n shares, so just a person having all n parts could encrypt it, while one sharing, i.e., n-1, provides no knowledge about the source image. Every share's visibility is printed, and the shares are decrypted by overlaying them. When all n shares are overlapped, the original image appears. The colour approximation of the human visual system is mostly exploited in this method. As a consequence, the secret picture may be reconstructed without a password using a basic film superposition (Lu et al. 2017).

A framework for Visual Secret Sharing (VSS) was proposed by (Wei et al. 2015); the cryptographic security technique that first conceals data to keep it secret then splits it and distributes it to several parties. Shamir and Blakley offered this technique in 1979, based on two independent techniques for secret sharing. This technique aims to divide the confidential information into n sections and distribute them to n persons. The true secret data will be revealed when (kt) people stack their pieces together. VSS improves the application and efficiency of secret sharing by providing visual information instead of sophisticated algorithms. Model checking is a computerized approach that works in the following way: It investigates the validity of property given bounded models of the system and a logical statement of the condition (such as temporal logic). It is a general approach that is used to verify software, hardware, and protocol descriptions in a range of applications. The existence of an attacker is used to verify a protocol, and if the protocol is found to be flawed, a bond is debt security of how a protocol misses fulfilling a given security property is presented (Bujang and Selamat 2009).

The architecture for mobile networks is primarily intended for methods based on the Global System for Mobile Communications (GSM). GSM, on the other hand, is vulnerable to a number of dangers. GSM was intended to increase security by reducing the amount of hardware required. A5 is a symmetric stream cypher that is used to encrypt GSM system over-the-air transmissions. The A5 algorithm receives 228 bits of plaintext as input and outputs 228 bits of ciphertext. Each 228-bit segment is referred to as a "frame" by (Nyamtiga et al. 2013). So far, many A5 variations have been developed, all of which use a symmetric session key KC and a frame counter Fn to generate a keystream of 228 pseudo-random segments. To generate 228 bits of ciphertext, this ciphertext is XORed with a 228-bit simple frame.

The emphasized protection and transactional characteristics (Bojjagani and Sastry 2015, 2017) are lacking in many mobile payment systems. Attackers are increasingly targeting mobile devices and payment systems. Most mobile payment apps employ the same application model as communication technologies like SMS, GSM, Bluetooth, NFC, and RFID. As a result, safety concerns are frequently disregarded while developing such programmes. They recommend particular attention to security aspects throughout the implementation and testing of mobile banking software. This section demonstrates how defects, attacks, risks, and threats might damage an

otherwise secure system. To better understand these risks, we must first define the terminology used by (Ok et al. 2012).

Bojjagani and Sastry (2017) divide hazards to mobile paymeont systems into three categories: threats at the software, connectivity, and device levels.

1. Software-level threats: These are mostly the responsibility of the software developer. A developer should focus on secure code practices while designing and implementing a mobile payment application. The dangers that we have concentrated on are listed below. Insecure data storage arises when app developers presume that consumers or malware will not have access to the file system or memory of a mobile device, where confidential data is kept. The (OWASP 2014) security software project classified this as one of the top ten threats. A malicious user or virus reviewing classified information kept in a smartphone device's storage should be expected. Rooting or jailbreaking a phone eliminates any cryptography security; in practice, an attacker is armed with specialized tools to review data held in unprotected data storage. On several occasions, MBAs have been caught keeping personal information such as usernames, passwords, and additional client information in a decrypted database or plist files.

2. Threats at the connectivity level: Adversaries may try to steal sensitive information by exploiting vulnerabilities in payment transactions that connect with web servers. These risks might come as a result of compromised entry points and routers, Wi-Fi scanning, and other network components such as cellphone towers, gateways, and MBAs failing to appropriately validate an SSL certificate, according to (Yang et al. 2017). These hazards are described in full below. An attack by a man-in-the-middle: One of the effective network assaults is a man-in-the-middle attack. Several additional MitM-related attacks have occurred. When a MitM assault is conducted, communication is captured or rerouted to the intruder, causing significant network harm. MitM simulation in a real-time situation was examined by (Akter et al. 2020; Bojjagani et al. 2020).

3. Device-level threats: Mobile phones may store classified information such as photographs, SMS messages, contacts, MMS, calendars, and memos. Smartphones may also store information such as geographic location, online website history, movies, social networking messages, e-mail, and contacts. This method allows the attacker to thoroughly investigate the file architecture of the mobile platform, functions, storage systems, and additional devices. For a multitude of reasons, including the use of mobile phones to store and transfer private and corporate information, forensic analysis is growing more popular. Mobile phones are being used to make online payments. Mobile forensics is becoming increasingly necessary for various reasons, including criminal activity, law enforcement, and mobile devices (Ahmed and Dhar Askar 2009). A shoulder hacker can collect classified information from the user when a protocol is executed. Shoulder browsing (Sinigaglia et al. 2019) is a method of obtaining data such as identification numbers (PINs), passcodes, and other classified information by peering over the victim's shoulder, either via keyboard strokes on a device or confidential material that are spoken and heard, also known as snooping.

This paragraph describes the risk model developed for an intrusion detection system. An adversary's principal goal is to break security features including secrecy, authentication, authorization, non-repudiation, and availability (Bojjagani and Sastry 2015, 2017). An attacker builds up a false Wi-Fi entry point using a threat model, and when a phone user establishes a connection via the entry point, the adversary employs a MitM. On the network, the attacker is actively monitoring traffic between the end-user and the server. In addition, the attacker has a self-signed identity that is either forged or out of date. The end-user wishes to connect to the network in Step 1; however, the query is forwarded to the MitM adversary. In Step 2, the MitM adversary intends to create a connection (HTTPs) with the selected browser server. The web server responds with a legitimate real-time certification in Step 3. In the meantime, the attacker sends a fake authorization to the smartphone app in Step 4. Due to the lack of authorization pinning on the mobile device, this scenario is possible (Moonsamy and Batten's 2014). As a result, the attacker can take advantage of flaws at all levels, as stated above.

The development of the mobile payment system is increasing day by day due to the use of various technologies that make payments easier and faster. The task that used to take hours and required going to the bank to complete can now be completed in a matter of minutes using mobile phones. But this modern technology comes with a set of drawbacks. We must concentrate on categorizing peer-reviewed research articles according to the newly offered security solution. Worst of all is the possibility of hostile agents compromising the payment system and stealing the money. The latest assault on blockchain-based bitcoin exchanges, which were previously regarded as the strongest digital payment method, increases fears that hackers are devising new ways to circumvent security protections (Qiao et al. 2021). The emerging theatre of morality for enhancing and securing the safety of mobile payment systems against threats is a valuable potential subject for research. In each industry, there is always space for improvement and advancement. We would like to try to understand customers' needs and the motivations for using or not using a certain technology-enabled experience in the future since this is crucial to developing long-term services that benefit customers and other ecosystem stakeholders. Mobile phones are frequently utilized and may be found in almost everyone's possession. Many companies have created mobile phone-based products since the majority of work, everyday purchases, and interaction takes place on a mobile phone (Saranya and Naresh 2021). Mobile payment solutions are also available nowadays, although they demand stronger protection than other mobile services. When compared to other conventional payment methods, mobile payment solutions will extend the client base, which is currently large. That increase will place a burden on infrastructure, which is important to the achievement of such solutions. Improvements in next-generation networks and their impact on mobile payment systems will also be investigated. An investigation of current limits that result in fewer mobile payment options, as well as remedial methods based on network advances, might also be conducted. There are certain conceptual and technical limitations in this work which might lead to significant findings in future research. We do not account for the impact of the digital economy on mobile payment systems, for example, which could lead to more

complex processes than those that emerge through modular rearranging alone. The following are some of the main open issues in mobile payment:

8   Detection of Malware

Many threats can be found in the mobile payment security issues, but the malware issues are the most significant. There are many implemented systems to prevent malware attacks (Gera et al. 2021). On the other hand, this attack was launched on a mobile device and the challenge is to identify the attack and prevent hits. Other malware detection tools, such as digital evidence, static analysis, and analysis methods, now are offered. None of them, on the other hand, can identify malware on mobile devices. It is important to have a malware detection system that is effective. Multi-factor verification may be used to prevent fraud when a user logs into a mobile payment system with a device. Customers should give an access code that is sent to them via emails or other forms of connection. Mobile devices, on the other hand, are easily misplaced or stolen. Users who have access to the e-mail account may try to fool the multi-factor verification system. It is conceivable that data will be leaked. A security breach exposes private details such as mobile telephone numbers, credit accounts, and transaction details. Users' privacy is being threatened. It has the potential to lead to identity fraud. At any time and from any location, mobile payment services are offered. Crooks can also profit from digital payment systems as a result of this. Criminals may utilize stolen card payments or hijacked mobile payment accounts to steal money or conduct fraudulent transactions. When fraudulent transactions occur, it is vital to detect and prevent them. If a user has lost money due to fraud, a clear description of the mobile payment assurance policy may help them gain confidence in utilizing a mobile payment system (Bubukayr and Almaiah 2021).

9   Conclusion

This chapter explored several purchasing methods and how they are applied, as well as mythology and security procedures. The majority of payment strategies are account-based settlement techniques, with protection, privacy, confidentiality, and authentication of top importance. We presented a summary of MPS and explored its many components. We offered a thorough examination of the existing MPS (Mobile Payment Security) structure and its flaws, as well as a history of the development and design of MPS. We addressed economic factors, cost-effectiveness, smartphone adoption, accessibility, innovative activities, severe restrictions and restrictions, inflexible association, a less developed ecosystem, and security risks, as well as MPS relevant attributes and stockholder and interaction entity roles. We emitted about the various security measures used in the MPS. MPS' cryptographic algorithms, digital certificates, and gateways are also examined. All of the articles provide

different methods for providing distinct levels of security. However, keeping the CIA (confidentiality, integrity, and availability) trinity in mind, since the security elements of MPS are crucial to its development, every transaction should be performed using secure communication.

References

Ahamad SS, Pathan AK (2019) Trusted service manager (TSM) based privacy preserving and secure mobile commerce framework with formal verification. Complex Adapt Syst Model (springer) 7(1):1–18

Ahamad SS, Sastry VN, Udgata SK (2017) A secure and optimized proximity mobile payment framework with formal verification. Mobile commerce: concepts, methodologies, tools, and applications 6:161–189

Ahmed R, Dharaskar RV (2009) Mobile forensics: an introduction from Indian law enforcement perspective. International Conference on Information Systems, Technol Manag (ICISTM'2009), CCIS (Springer) 31:173–184, 12–13 Mar 2009, Ghaziabad, India.

Akter S, Chellappan S, Chakraborty T, Khan TA, Rahman A, Al I, Alim ABM (2020) Man-in-the-middle attack on contactless payment over NFC communications: design. Implementation, experiments and detection, IEEE transactions on dependable and secure computing.

Alliance SC (2008) Proximity mobile payments business scenarios: research report on stakeholder perspective. A Smart Card Alliance Contactless Payments Council White Paper. Princeton Junction, NJ.

Almuairfi S, Veeraraghavan P, Chilamkurti N, Doo-Soon P (2014) Anonymous proximity mobile payment (APMP). Peer-to-Peer Net Appl (springer) 7(4):620–627

Al-Saedi K, Al-Emran M, Ramayah T, Abusham E (2020) Developing a general extended UTAUT model for M-payment adoption. Techn Soc 62:101293. https://doi.org/10.1016/j.techsoc.2020. 101293

Bell CJ, Hogarth JM, Robbins E (2009) US households' access to and use of electronic banking. 1989–2007. Federal Reserve Bulletin (July)

Bellare M, Garay JA, Hauser R, Herzberg A, Krawczyk H, Steiner M, Waidner M (2000) Design, implementation, and deployment of the iKP secure electronic payment system. IEEE J Sel Areas Commun 18(4):611–627

Bojjagani S, Reddy BR, Sandhya M, Vemula DR (2020) CybSec-MLC: a comparative analysis on cyber security intrusion detection using machine learning classifiers. Symposium on machine learning and metaheuristics algorithms, and applications (SoMMA'2020):232–245, 14–17 Oct 2020, Chennai, India.

Bojjagani S, Sastry VN (2015) Stamba: security testing for Android mobile banking apps. In Proceedings of the second international symposium on signal processing and intelligent recognition systems

Bojjagani S, Sastry VN (2017) VAPTAi: a threat model for vulnerability assessment and penetration testing of android and iOS mobile banking apps. In IEEE 3rd international conference on collaboration and internet computing (CIC), San Jose. California, USA:77–86. https://doi.org/ 10.1109/CIC.2017.00022

Bouazzouni MA, Conchon E, Peyrard F (2018) Trusted mobile computing: an overview of existing solutions. Fut Gen Comput Syst (elsevier) 80:596–612

Bujang SDA, Selamat A (2009) Verification of mobile SMS application with model checking agent. International conference on information and multimedia technology (ICIMT'2009):361–365, 16–18 Dec 2009, Jeju, Korea (South).

Bubukayr MAS, Almaiah MA (2021, July) Cybersecurity concerns in smart-phones and applications: a survey. In 2021 international conference on information technology (ICIT) (pp. 725–731). IEEE.

Chaum D, Fiat A, Naor M (1988, August) Untraceable electronic cash. In Conference on the theory and application of cryptography (pp. 319–327). Springer, New York, NY

Dahlberg T, Mallat N, Öörni A (2003) Trust enhanced technology acceptance model consumer acceptance of mobile payment solutions: tentative evidence. Stockholm Mobility Roundtable 22(1):145

Dizaj MVA, Moghaddam RA, Momenebellah S (2011, August) New mobile payment protocol: mobile pay center protocol 2 (MPCP2) by using new key agreement protocol: VAM. In Proceedings of 2011 IEEE pacific rim conference on communications, computers and signal processing (pp. 12–18). IEEE

Du K (2018) Complacency, capabilities, and institutional pressure: understanding financial institutions' participation in the nascent mobile payments ecosystem. Electron Mark 28(3):307–319

de Luna IR, Liébana-Cabanillas F, Sánchez-Fernández J, Muñoz-Leiva F (2019) Mobile payment is not all the same: the adoption of mobile payment systems depending on the technology applied. Technol Forecast Soc Chang 146:931–944

Fan J, Shao M, Li Y, Huang, X (2018) Understanding users' attitude toward mobile payment use: a comparative study between China and the USA. Ind Manag Data Syst.

Federal Reserve Board (2013) Consumers and mobile financial services 2013. Retrieved November 15, 2013, from http://www.federalreserve.gov/econresdata/mobile-device-report-201203.pdf

Federal Reserve (2013) Statistical release G.19: consumer credit card (released September 9, 2013). Retrieved September 29, 2013, from http://www.federalreserve.gov/releases/g19/Current/g19.pdf

Flavián C, Guinaliu M, Lu Y (2020) Mobile payments adoption–introducing mindfulness to better understand consumer behavior. Int J Bank Mark

Gao L, Waechter KA (2017) Examining the role of initial trust in user adoption of mobile payment services: an empirical investigation. Inform Syst Frontiers (springer) 19(3):525–548

Gerpott TJ, Meinert P (2017) Who signs up for NFC mobile payment services? mobile network operator subscribers in Germany. Electron Commer Res Appl 23:1–13

Gera T, Singh J, Thakur D, Kaur A (2021, October) A survey on andro-financial Malware attacks, detection methods and current issues. In 2021 6th international conference on signal processing, computing and control (ISPCC) (pp. 587–593). IEEE.

Hayashi, F (2012) Mobile payments: What's in it for consumers? *Economic Review, First Quarter*, 35–66.

Hidayat-ur-Rehman I, Alzahrani S, Rehman MZ, Akhter F (2022) Determining the factors of m-wallets adoption. a twofold SEM-ANN approach. Plos One 17(1):e0262954

Hogarth JM, Anguelov C (2004) Are families who use e-banking better financial managers? J Financ Couns Plan 15(2):61–77

Huang LK (2017) A cultural model of online banking adoption: Long-term orientation perspective. J Organ End User Comput (JOEUC) 29(1):1–22

Isaac, JT, & Sherali, Z (2014) Secure mobile payment systems. *It Professional, 16*(3), 36–43.

Isaac JT, Zeadally S, Camara JS (2012) A lightweight secure mobile payment protocol for vehicular ad-hoc networks (vanets). Electron Commer Res 12(1):97–123

Kadhiwal S, Zulfiquar AUS (2007) Analysis of mobile payment security measures and different standards. Comput Fraud Secur 6:12–16

Kailar R (1996) Accountability in electronic commerce protocols. IEEE Trans Software Eng 22(5):313–328

Kolodinsky JM, Hogarth JM, Hilgert MA (2004) The adoption of electronic banking technologies by US consumers. Int J Bank Mark

Kungpisdan S (2005) Modelling, design, and analysis of secure mobile payment systems (Doctoral dissertation, Monash University).

Kungpisdan S (2009, September) Accountability in centralized payment environments. In 2009 9th international symposium on communications and information technology (pp. 1022–1027). IEEE.

Lassar WM, Manolis C, Lassar SS (2005) The relationship between consumer innovativeness, personal characteristics, and online banking adoption. Int J Bank Mark

Leong LY, Hew TS, Ooi KB, Wei J (2020) Predicting mobile wallet resistance: a two-staged structural equation modeling-artificial neural network approach. Int J Inf Manage 51:102047

Li W, Xia Y, Lu L, Chen H, Zang B (2019) TEEv: virtualizing trusted execution environments on mobile platforms. In Proceedings of the 15th ACM SIGPLAN/SIGOPS international conference on virtual execution environments (pp. 2–16)

Li Y, Wang Y (2014) Secure electronic transaction (SET protocol)

Liébana-Cabanillas F, Marinkovic V, de Luna IR, Kalinic Z (2018) Predicting the determinants of mobile payment acceptance: a hybrid SEM-neural network approach. Technol Forecast Soc Chang 129:117–130

Loh XM, Lee VH, Hew TS, Lin B (2022) The cognitive-affective nexus on mobile payment continuance intention during the COVID-19 pandemic. Int J Bank Mark

Lu J, Yang Z, Li L, Yuan W, Li L, Chang CC (2017) Multiple schemes for mobile payment authentication using qr code and visual cryptography. Mobile Information Systems (Hindawi).

Liu Y, Ai Z, Sun S, Zhang S, Liu Z, Yu H (2020) Fedcoin: a peer-to-peer payment system for federated learning. In Federated learning (pp. 125–138). Springer, Cham

Mallat N, Tuunainen VK (2008) Exploring merchant adoption of mobile payment systems: an empirical study. E-Service J 6(2):24–57

Medvinsky G, Neuman C (1993, December) NetCash: a design for practical electronic currency on the Internet. In Proceedings of the 1st ACM conference on computer and communications security (pp. 102–106)

Moonsamy V, Batten L (2014) Mitigating man-in-the-middle attacks on smartphones-a discussion of ssl pinning and dnssec. In Proceedings of the 12th Australian information security management Conference (pp 5–13)

Nguyen TNT, Shum P, Chua EH (2005, November) Secure end-to-end mobile payment system. In 2005 2nd Asia Pacific Conference on Mobile Technology, Applications and Systems (pp. 4-pp). IEEE

Nyamtiga BW, Sam A, Laizer LS (2013) Security perspectives for ussd versus sms in conducting mobile transactions: a case study of tanzania. Int J Technol Enhancements Emerg Eng Res 1(3):38–43

Ok K, Coskun V, Ozdenizci B (2012) Near field communication: from theory to practice. John Wiley and Sons.

Ooi KB, Tan GWH (2016) Mobile technology acceptance model: an investigation using mobile users to explore smartphone credit card. Expert Syst Appl 59:33–46

Oentoro W (2021) Mobile payment adoption process: a serial of multiple mediation and moderation analysis. The Bottom Line.

OWASP-2014 https://owasp.org/www-project-mobile-top-10/ (Accessed: 06-6-2022)

Pauluzzo R, Geretto EF (2018) Validating the EUCS model to measure the level of satisfaction of Internet users in local banks in Italy. J Organ End User Comput (JOEUC) 30(1):66–81

Perry P, Kent A, Bonetti F (2019) The use of mobile technologies in physical stores: the case of fashion retailing. Exploring omnichannel retailing:169–195

Prakasha K, Muniyal B, Acharya V (2019) Enhanced authentication and key exchange for end to end security in mobile commerce using wireless public key infrastructure. Information Discovery and Delivery

Qian T, Zhen L (2018, May) Design of transnational mobile e-payment application based on SIM card. In AIP conference proceedings (Vol. 1967, No. 1, p. 020011). AIP Publishing LLC

Qiao Z, Yang Q, Zhou Y, Zhang M (2021) Improved secure transaction scheme with certificateless cryptographic primitives for iot-based mobile payments. IEEE Systems Journal

Rogers EM (2010) Diffusion of innovations. Simon and Schuster, New York

Samadani MH, Shajari M, Ahaniha M (2010) A survey on mobile digital signature models. In:Proceedings of the 12th ACM International Conference on. Electronic Commerce: Roadmap for the Future of Electronic Business (ICEC'10), pp 141–145, 02–04 (August 2010) Honolulu. HI, USA

Sekhar VC, Sarvabhatla M (2012, January) Secure lightweight mobile payment protocol using symmetric key techniques. In:2012 International Conference on Computer Communication and Informatics (pp. 1–6). IEEE

Sharma SK, Sharma M (2019) Examining the role of trust and quality dimensions in the actual usage of mobile banking services: an empirical investigation. Int J Inf Manage 44:65–75

Shedid SM, Kouta M (2010, October) Modified SET protocol for mobile payment: an empirical analysis. In 2010 2nd international conference on software technology and engineering (Vol. 1, pp. V1–350). IEEE

Sim JJ, Tan GWH, Wong JC, Ooi KB, Hew TS (2014) Understanding and predicting the motivators of mobile music acceptance—a multi-stage MRA-artificial neural network approach. Telematics Inform 31(4):569–584. https://doi.org/10.1016/j.tele.2013.11.005

Sinigaglia F, Carbone R, Costa G, Ranise S (2019) Mufasa: a tool for high-level specification and analysis of multi-factor authentication protocols. In Second international workshop on emerging technologies for authorization and authentication, (ETAA'2019), pp 138–155, 27 September 2019, Luxembourg

Solat S (2017) Security of electronic payment systems: a comprehensive survey. arXiv preprint arXiv: 1701. 04556.

Suryaman M, Cahyono Y, Muliansyah D, Bustani O, Suryani P, Fahlevi M, Munthe AP (2020) COVID-19 pandemic and home online learning system: does it affect the quality of pharmacy school learning. Syst Rev Pharm 11(8):524–530

Sumathy M, Vipin KP (2017) Digital payment systems: perception and concerns among urban consumers. IJAR 3(6):1118–1122

Saranya A, Naresh R (2021) Cloud based efficient authentication for mobile payments using key distribution method. J Ambient Intelligence Humanized Comput:1–8

Tellez Jesus and Zeadally S (2017) Architectures and models for mobile payment systems. In Mobile payment systems, pp 35–91

Tripathi DM, Ojha A (2012, March) LPMP: an efficient lightweight protocol for mobile payment. In 2012 3rd national conference on emerging trends and applications in computer science (pp. 41–45). IEEE

Tuecke S, Welch V, Engert D, Pearlman L, Thompson M et al (2004) Internet X.509 public key infrastructure (pki) proxy certificate profile. Technical report, RFC-3820 (Proposed Standard)

Verkijika SF, Neneh BN (2021) Standing up for or against: A text-mining study on the recommendation of mobile payment apps. J Retail Consum Serv 63:102743

Wang L, Luo XR, Yang X, Qiao Z (2019) Easy come or easy go? empirical evidence on switching behaviors in mobile payment applications. Inf Manag J 56(7):103150

Wei KJ, Lee JS, Chen SJ (2015) Enhancing the security of credit card transaction based on visual DSC. KSII Trans Internet Inf Syst (TIIS) 9(3):1231–1245

Yang W, Zhang Y, Li J, Liu H, Wang Q, Zhang Y, Gu D (2017) Show me the money! finding flawed implementations of third-party in app payment in android apps. In Network and distributed system security symposium (NDSS), San Diego, CA, USA

Yen SM, Lin HC, Chen YC, Hung JJ, Wu JM (2014) PayStar: a denomination flexible micropayment scheme. Inf Sci 259:160–169

Yue W (2015) Semopias: a novel secure and efficient mutual open PKI identity authentication scheme for mobile commerce. InThe proceedings of the third international conference on communications, signal processing, and systems, pp 373–380, July 14–15 2015, Hohhot, China.

Zaman A, Islam MN, Zaki T, Hossain MS (2020) ICT intervention in the containment of the pandemic spread of COVID-19: an exploratory study. arXiv preprint arXiv:2004.09888.

The Role of Online Advertising in the Intentions of Customers

Sammar Abbas, Zeeshan Zaib Khattak, and Hadi Al-Abrrow

1 Introduction

With the advent and development of information technology social media has become a major source of information. Businesses around the world rely heavily on social media to collect information (customers' feedback, product rating, etc.) to continuously improve their products and services. Social media provides businesses a wider platform to launch their product and reach the distant customers. Accordingly, social media is used as a major tool for product and service promotion through online advertising (Mohammed and Alkubise 2012). Businesses accumulate huge amounts in their annual budget for online advertising. For example, during 2021 the worldwide spending on online or digital advertising amounted to US $455 billion and this is expected to be more than $645 billion in the year 2024.

The recent revolution in information technology has enabled more people to be connected worldwide with other people and companies through various digital devices and have readily access to products and services globally. They spend more time online in searching the products and services of their choice. We witness everyday innovation and creativity through rapid developments in information technology. This has benefitted businesses around the globe where the internet serves as a major tool of communication between businesses and customers. The information

S. Abbas (✉) · Z. Z. Khattak
Institute of Business Studies, Kohat University of Science and Technology (KUST), Kohat, Pakistan
e-mail: sabbas@kust.edu.pk

Z. Z. Khattak
e-mail: dr.zeeshan@kust.edu.pk

H. Al-Abrrow
Business Administration Department, University of Basrah, Basrah, Iraq
e-mail: Hauni_2000@yahoo.com

technology has completely changed the advertisement mechanism from traditional advertisement to online advertisement (Hollis 2005; Hassanein and Head 2007).

Over the last few years, social media has become a powerful communication tool and has found its place in all spheres of life. Accordingly, businesses and customers have shifted their focus to the effective and efficient use of social media platforms such as Facebook, Twitter, LinkedIn, etc. (Alalwan 2018; He and Shao 2018; Dwivedi et al. 2017). The massive penetration of social media into businesses activities has changed the mode of interaction between businesses and customers. Businesses do not need to be physically present to access the customers and similarly customers can search product or service of their choice from variety of products and services advertised through social media platforms. It can be said that social media has completely transformed mode of interaction between businesses and customers from physical to online, and, the exchange of information has become quite easy and useful (Kim and Kim 2018; Jung et al. 2016). Businesses have started to use social media platforms quite extensively to generate more profit and establish sustainable business relationship with the customers. Businesses use social media platform for various purpose, for example, advertising, electronic word of mouth, branding, etc.

However, among all these social media advertising, commonly known as online advertising, has got much popularity among the scholars and practitioners (Alalwan 2018). One major reason for this is that businesses are spending quite a handful amount in online advertising. This in turn suggests investigating the viability of online social media advertising programs from businesses' perspectives. Modern web technology web 2.0 has brought many sophistications in ways of interacting with the customers. Advertisers can develop information rich and interactive ads based on the customers' reviews obtained through two-way business-customer communication (Muñoz-Leiva et al. 2019). Social media ads not only help businesses to effectively convey their message to targeted customers but also facilitate businesses to create customer' awareness, shaping their buying attitude and motivating them to make purchases. Businesses do realize that customers may have varying perception when they interact with online advertising. Social media empowers customers to engage more with the online ads through reviews, likes, and resharing. Hence, it is equally important to focus on that how do customers react to online advertising? Customers' reaction toward and perception of online advertising play a major role in purchase decision. This asks for more studies to investigate the role of online advertising toward purchase decision (Akel and Candan 2022; He and Shao 2018).

The fast growth of internet has influenced the way businesses communicate with their customers. It has made possible for the businesses to target the needs of the worldwide spread customers. The businesses have shifted from physical to online market and increased their customers' net. With the ever-increasing number of customers preferring to use online media platforms and online purchases, the businesses are capturing new and emerging opportunities on these online platforms. Social media has become a powerful and widely used marketing tool to market the products and services. Bernoff and Li (2011) argued that online social media platforms have emerged as powerful communication tool to provide customers with opportunities to develop stronger networks. Customers share product and service

related information through their online networks instead of relying only on information shared by the businesses. They are more intended to use online social media as a major source of information instead of relying on traditional media (Mangold and Faulds 2011). This has created a challenge for businesses to create brand loyalty because customers do not solely depend on vendors' information but what the other customers say matter them more. The transformation from traditional to online media has required business to be more careful while sharing the product information on social media platforms (Keller and Fay, 2009).

More than a 'marketing place' social media offers an 'interaction place' with the opportunity to businesses to build long-term relationships with variety of customers (Gordhamer 2009). Instead of launching the big marketing campaigns, businesses need to develop short and specific ads to reach maximum customers to achieve the targets. Social media is quite different from traditional media because it offers more transparent information instead of fabricated and hence communicating the brand as perceived by the peers instead of what vendors want to communicate the brand image. Everson (2014) suggested businesses to hire special social media experts to properly evaluate the customers' reviews and feedbacks to interact with the customers online for better presentation of products and services on online platforms. In this way, businesses can reach more customers with lesser cost. An effective online advertising campaign can help businesses to remove 'customers' biases' and remove misunderstandings about the products and services. It can also facilitate customers to engage with other customers to increase the brand value (Wolny and Mueller 2013; Kim and Ko 2010). The positive or negative reviews on online media platform significantly influence brand image and also the purchase decision. Because the value of the brand is largely dependent on customers' reviews, so the businesses need special attention on management of customers on online platforms (Vij and Sharma 2013).

2 Online Advertising

According to the American Marketing Association advertising is defined as "any paid form of non-personal promotion of ideas, goods or services by an identified advertiser." Kotler et al. (2006) have defined advertising as paid promotion of products and services via non-personal promotion to create and sustain brand image. Advertisement has been described as a "prominent feature of economic life" (Bagwell 2007, p. 1705). Advertisements serve variety of purposes. Mostly advertisement is used to pursue and alter the consumers' tastes and can significantly reduce cost of obtaining customers' related information. Though the offline advertising and online advertising serve almost the same purpose, the major advantage of online advertisement is cost reduction.

World is living in age of information technology and surrounded by internet as a major source of information. The development of internet has invited businesses around the globe to locate new and more profitable business opportunities. Internet

has offered businesses new and innovative ways of marketing their products and services to geographically spread customers with much ease and speed. With the arrival of internet, the traditional advertising platforms (television, newspapers, and radio) have gone through major transformation and replaced by more cost effective and efficient social media platforms. Internet has proven to be a source of profit for advertising companies who have shifted from traditional to online advertising. Veges and Grigore (2003, p. 90) defined online advertising as a "type of advertising displayed on the Internet, having similar purposes to traditional advertising, but the means and methods of expression, communication, and interaction with the target audience are specific to the electronic environment. This characteristic is manifested mainly by direct interaction, real-time communication and feedback, and targeting restricted to the individual level." With more people spending more time on social media and internet, the online advertisement is growing as a major segment of marketing campaign. Some of the technology tycoons like Google and Facebook generate a greater amount of their revenue by offering online advertisement to businesses.

The history of online advertising is not too old. It is believed to be started in 1994 when a US-based company 'Hot Wire' first time offered its product on company' website. Afterward other companies followed the footsteps of 'Hot Wire' to access customers. For a quite long time, advertising campaigns were led by the traditional media of television, radio, and newspapers. Businesses were not able to reach distant customers while using these media channels. The issue of accessibility and availability of these media on the part of customers always hindered the businesses' ability to effectively transmit their message to targeted customers (Opreana and Vinerean 2015). Then came the era of 'internet' which revolutionized every aspect of socioeconomic life. Internet is a network of inter-connected computers which facilitate two-way communication between senders and end users. Businesses shifted their advertising campaigns from traditional media to internet as it provided less expensive and faster communication between businesses and customers. Though online advertising or internet advertising is effective tool to reach the distant customers, there are various aspects of online advertising which make it more effective and efficient channel. The increase in the number of internet users over the past few years have motivated businesses to develop innovative ways of increasing customers' online purchase. Businesses bring in innovative marketing strategies to make their products and services more attractive and to access more customers. Online advertising provides businesses with an opportunity to place their products and services looking more attractive and aligned with customers' requirements (Mohammed and Alkubise 2012; Wu 2005).

Online advertising is known with different names like digital advertising, web advertising, internet advertising, etc. Generally, online advertising is defined as a marketing strategy which rely on 'internet' to obtain products' and customers' relevant information to target and deliver its products and services to right customers (Mohammed and Alkubise 2012; Casalo et al. 2007). Accordingly, online advertisements are the website contents that are tailored to deliver marketing message to targeted customers to seek their response in a way that they intend to buy

company's products and services. Online advertising is featured with close interaction between customers and businesses, readily available customers' feedback, and targeting the specified market which is difficult task in offline advertising (Frick et al. 2021; Kim and Moon 2020). Unlike traditional offline advertising where businesses initiate advertising program to transmit product/service-related information to customers, there is entirely different mechanism where the consumers initiate advertising program through information seeking. Businesses collect customers' data and use this data to transmit the requisite information to the customers. This also facilitates the customers to exactly find the required information to make purchase decision. Online advertising must also deal with some other important issues of space, time, image creation, direction of communication, interactivity, and call to action (Barbu et al. 2019). These issues are briefly described as under.

Space is usually not a bigger issue in online advertising. There are fewer limitations regarding ad dimension on the webpages. Generally, advertiser can put all the contents in an online ad which deem important to convey message to targeted customers. Webpages also offer opportunity to create the different customer's specific online ads with specific information which advertiser wants to be there. In online advertisement, time refers to what customers spend online in searching for product or product-related information. There must be permanent display of information because customers may return to online ads and can also invite others to do so. This information must be presented in an attractive way to add value to customers' online advertising experience (Veges and Grigore 2003). Creating product and service positive image is also an important concern in online advertising. In the case of traditional offline advertisement, the ads need to be designed keeping in view the limitations of the media. For example, images need to be either static or moving, insertion of music, etc., is always challenging in traditional advertising media. Images appearance in traditional media is based on little and limited amount of information, whereas online advertising uses variety of information databases to create product image. With the use of computer programing, online ads can be more effective in displaying images with spatial and visual effects. In traditional advertising media, there is one-way communication from advertiser to customer, where customer may choose to listen the message or ignore it. Similarly, they cannot obtain additional information to make purchase decision. However, in online environment, the customers have liberty to view online store, as much information and give their feedback and receive seller response. There is a two-way communication which helps both customers and businesses to know about each other's preferences and design the ads accordingly to disseminate maximum information. Instantaneous provision of required information in an online environment helps customer to make purchase decision without unnecessary delays (Barbu et al. 2019).

Goldfarb (2014) described three generic categories of online advertising which include search advertising, classified advertising, and display advertising. Search advertisement is algorithmic advertisement which produces search results on search engine, for example Google or Bing, through matching the results from a customer's search statement. Customers search for something by typing a statement in search bar. Through computer algorithm, search bar shows ads at the same time when customer is

looking for something else. In this way, businesses get their products/services noticed even when the customers are not intended to view them. Businesses do not need to pay for such kind of ads until they are not clicked by customers. Simply, we can say that search advertising show online advertisement through matching keywords from the search statement (Athey et al. 2013; Forman et al. 2009). Classified advertisement is different from search advertisement in a way that it is not based on computer algorithm. These are 'grouped' advertisements appearing under specified category in a section of a website/advertising media. Online job sites, online advertisement for accommodation, sale and purchase fall into this category. One example of classified advertisement is 'Craigslist,' a US advertisement website having different sections on jobs, accommodation, sale, purchase, etc. Display advertisement is a type of advertisement which combines the text, image, and URL that link to a website where customers can find more information about a specific product or service. For online commercial websites and media, display advertisement generates greater revenue. Display ads include videos and other ads which are displayed on different social media. Another emerging type of online advertising is 'contextual targeting that match the product context with the web context. It is similar to search advertising. One common example of such advertising is ads about the cars and related materials on pakwheels.com or cars.com. These ads appear on specific website made for those products or services (Goldfarb and Tucker 2011b; Ghose and Yang 2009.

Online advertisements differ in terms of various characteristics like contents, designing, appearance, etc. These characteristics help businesses to place their products and services differently and in a unique way apart from their competitors. Businesses are more concerned about the quality of these features because they significantly effect target customers and help businesses to seek and secure competitive advantage. They enhance products and services effectiveness and visibility which are major factors to customers purchase decision-making. For example, there are numerous studies which have found that size of the online advertisement significantly influences the number of clicks on that advertisement. Likewise larger online advertisement is more attractive to generate customers' positive response. Similarly, the appearance of design and advertisement contents stimulates customers' interest in online advertising and subsequent purchase decision. Another important dimension of online advertisement is quality of online advertising. Businesses cannot afford to overlook quality component because it can cost in terms of negative customers' responses. The number of locations of online advertisement is also important to access more and more customers. This means the number of webpages showing the online advertisement. Likewise, advertisement should be placed appropriately on webpages to make it clearly visible and understandable (Mohammed and Alkubise 2012; Danaher and Mullarkey 2003).

3   Effectiveness and Issues of Online Advertising

There are numerous studies which encompass the effectiveness of online advertisement (e.g., Lewis and Rao 2012; Malheiros et al. 2012; Lewis et al., 2011). However, still there is no mutually agreed criteria to judge the effectiveness of online advertising. One traditional way used to judge the effectiveness of online advertising is to conduct the field experiments or statistical methods to measure the relationship between advertising and sales growth and thus to make an inference. However, these studies have their own limitations such as external validity and business issues. Similarly, the findings of correlational or relational studies have little practical implications because it is difficult to judge if the same customer views the ads and then purchases the product. However, there is larger interest in measuring the effectiveness of online advertising and in recent past this interest has grown significantly. Studies have identified that it is comparatively easy to determine the effectiveness of online advertising (Goldfarb and Tucker 2011c). Internet communication has facilitated to identify the customers who click or see an ad. Online responses such as clickthrough rate (CRT) can easily be determined. CRT is number of clicks an ad receives divided by number of times an ad is shown.

Additionally, there are recent developments such as 'trackers' through which the businesses can know if the customers who see the ad also buy the same. Similarly, computer networking (customer's device is connected to website server) helps to separate the data and thus to identify if the online view of advertising resulted into actual purchases or not (Goldfarb 2014). Generally, with the advent of information technology, there are numbers of techniques/programs which can easily determine the effectiveness of online advertising. Another measure of online advertising effectiveness is cost reduction (Bagwell 2007; Bakos 1997). Online advertising shows multiple and random ads to customers at a time and thus reduces the cost of targeting the customers. Instead of showing different ads at different time and through different media, online advertising helps to display the ads in a randomized way and thus helps businesses to view the customers' responses to mend their products, services, and strategies. This is all possible because of two-way internet communication between webserver and user device (Goldfarb 2014). Equally important is the website which display online advertisement. A choice of relevant and appropriate website to place advertisement make online advertising more effective in terms of influencing the customers. It is well-known fact that websites serve major source to disseminate company's and product' information and create public awareness about products and services. Ideally, a company's website must be rich in its contents and easy to use. An information-rich and user-friendly website invites more traffic and hence creates greater chances to attract more customers. Customers intend to revisit website which is attractive, secure, easy to use, and has more information. In addition to quality of website, the other features like design of website, search bar, language, context, outlook, and display are equally important in choice of a website for placing an online advertising. These all features provide businesses and customers with a range of options to make better choice. In a study about the effects of online advertising on

customers' purchase intention among university students in Jordan, it was revealed that website reputation is one of the major factors which enhances the effectiveness of online advertising and stimulates customers' purchase intentions (Casalo et al. 2007).

Though there are many benefits of online advertising, there are potential issues of customers' privacy and antitrust. In recent years, many studies have investigated the emergence of privacy and antitrust issues in the context of online advertising. Online advertising involves collection and preservation of customers' data. Apparently, businesses use this data to develop customers' specific ads, to judge the online advertising effectiveness, and to make other ads for commercial purposes. However, it has given rise to the major concerns about the privacy of customers. This is important due to the widespread usage of internet among masses. Goldfarb and Tucker (2012) conducted a study to investigate the customers' privacy response related to the online advertising. They conducted an online survey for the period 2001–2008 and found that customers were hesitant to provide personal information in later years of survey even when the survey was harmless to customers and incorporate all customers' related ethics.

The privacy concerns with online advertising have given rise to new research domains and many studies have been conducted to evaluate different privacy-related aspects of online advertising like customers' privacy and effectiveness of online advertising, effects of privacy on product/service innovation. Studies have documented that customers are less likely to perform online transaction if they are afraid of information sharing. Similarly, various studies have found that customers' privacy concerns significantly effect online advertising effectiveness. For example, Goldfarb and Tucker (2011a), Malheiros et al. (2012), and Tsai et al. (2011) revealed that privacy-sensitive customers demonstrate negative attitude toward online advertising and felt discomfort in case of targeted advertisement with greater chances of information sharing. Many countries around the world have introduced privacy regulations and data protection acts which businesses are required to implement and practice. These privacy regulations have limited the effectiveness of online advertising because it restricts businesses to share customers' data.

Another important issue related to online advertising is 'antitrust' in the contents of online advertising. Same as privacy regulations, there are antitrust-related regulations where antitrust authorities have closer look on online advertising programs. For example, Google has faced antitrust investigation both in America and European countries initiated by the Federal Trade Commission in USA and European Commission. Various studies (e.g., Budzinski and Lindstädt-Dreusicke 2020; Tucker 2019) have shown that antitrust issue is more related to the innovation intensive firms who heavily rely on online advertising for their product promotion. These studies have also revealed that there are closer links between antitrust and privacy concerns in online advertising.

4 Social Commerce

The concept of social commerce is relatively new and it refers to new ways of doing business using internet. Officially, the term social commerce was coined by 'Yahoo' in 2007, and it caught the attention of academia after two years when Jăscanu et al. (2007) published their famous work on 'A new approach to E-commerce multi-agent systems.' However, many believe that the birth of social commerce is linked with the famous book of Surowiecki (2004) 'the Wisdom of Crowd.' In this book, Surowiecki talked about that how the collective actions and wisdom guide to better and intelligent decision-making. With the expansion of online social networking social commerce has emerged as a more feasible business avenue in the age of information technology. The growth of social networking sites (SNSs) is the main reason for the transformation of businesses from traditional to online mode. Social commerce has facilitated customers by designing customers' friendly online interactive contents (Liang et al. 2011; Liang and Turban 2011; Friedrich 2015). Social commerce phenomenon is bringing new features to business models to make them more customer friendly with added value for improved marketing experience.

With the emergence of web 2.0 technology and heavy reliance on social media, social commerce is overcoming the traditional ways of doing business. Social commerce is an emerging field which is supported by the developments in information technology, especially, web 2.0 technology. Through number of online platforms (chat rooms, podcast, ranking, geo-tagging), social commerce has enabled customers' access to various information databases. This facilitates the customers to locate and purchase a product/service of their choice (Jăscanu et al. 2007). Social commerce is based on two business models, i.e., business to customer (B2C) and customer to customer (C2C). Social commerce integrates these two approaches for doing business. It offers customers opportunities to online shopping and collaboration with other remotely located customers (Leitner and Grechinig 2007a, 2007b; Stephen and Toubia 2010). With the expansion of information technology, social commerce is becoming a mobile platform which is easily accessible to customers through smart gadgets (smartphones, smart watches, etc.). Businesses have learned that majority of customers use online platforms to review and recommend products. These online reviews have become more powerful than the product advertisements, and, significantly influence purchase decision.

Literature has identified several related concepts of social commerce. These are consumer-centric community (Leitner and Grechinig 2008a, 2008b), crowd sourcing (Leitner and Grechinig 2007b, 2008a, 2008b), multichannel shopping (Leckner and Schlichter 2005), revenue models (Leitner and Grechinig 2008a; Kang and Park 2009), service-oriented architecture (Liu et al. 2005), and user generated contents (Ghose and Ipeirotes 2009; Leitner and Grechinig 2008a, 2008b). Consumer-centric community refers to online community which asks for using collaborative and interactive experiences of community for better and informed communication between community and then step-by-step integration of information about products to make wise decision. Crowd sourcing is a term introduced by Howe

(2006) and refers to taking benefits of diverse crowd experiences. Multichannel shopping is a technology-based structure which allows customers to purchase products in "consolidated fashion" (Curty and Zhang 2011) using multiple channels (both physical and online). The use of multiple shopping channels enriches customers' online shopping experiences. Revenue models refer to various ways of generating revenue and profit and are commonly used in social commerce, like advertisement, third-party affiliations, and membership fees. Service-oriented architecture considers all applications or sources as service to be implemented to an identified business operations with the help of multi-channeling and real-time application (Curty and Zhang 2011). Lastly, user-generated content is a set of customers generated online contents (reviews, rating, opinion, etc.) that represent the product evaluation by the customers on online platforms. Wang and Zhang (2012) introduced four perspectives to understand the term social commerce. These four perspectives include people, business strategies, technology, and information. People's perspectives refer to individuals, customers, and societies mandatory to the social facet of social commerce. It entails acceptance/rejection of social commerce, people's attitude toward social commerce, roles of individuals in promoting social commerce, and collaboration between the individuals. Business perspective denotes the businesses strategies, policies, procedures, and practices that vendors use in online social commerce transactions to generate profit. It encompasses the use of web 2.0 technology and other emerging social commerce trends for better business. Technology perspectives define the use of information technology and various smart applications for technological viability of social commerce transactions. These include website features, online visualization of product and services, and other online features to enrich online shopping experience. The fourth one is information perspective that refers to online environment which allows creation of online contents relevant to business, product, and service. These contents are constantly produced through online reviews and feedback. The contents include social bookmarking or tags, emotions, textual, audio and video reviews.

Social commerce benefits the vendors in multiple ways, for example, it helps to build sustainable customer relationships, improve relationship quality, increase in revenue, and ensure customers' loyalty (Hajli 2014). The transformation of e-commerce into s-commerce has also redefined the customers' role due to shift of bargaining power from vendors to customers (Kim 2012; Hajli and Sims 2015; Huang and Benyoucef 2013). Now customers are central to vendors' advertising and other marketing campaigns. Vendors are more inclined to develop customer-oriented marketing programs instead of product/service-oriented ones (Huang and Benyoucef 2013; Wigand et al. 2008). Businesses are exploring information technology to secure maximum technology benefits. For instance, the two online business giants 'Amazon and eBay' are pioneer of e-commerce but in recent times they have transformed their business strategies using the social networking sites (SNSs) like Facebook, LinkedIn, etc. Amazon is said to have restructured its customers' relationship strategy to allow its customers to exchange their views with others having common interests (Amblee and Bui 2011). In a recent study, it was revealed that s-commerce is accelerating at a rapid pace and businesses are pouring millions of dollars into s-commerce activities (Liu et al. (2016).

As stated earleir that s-commerce is a newer concept so the research in the filed of s-commerce is at earlier stages. There is no conclusive understanding of what constitutes s-commerce. Businesses and information technology companies need to further explore newer avenues with empirical evidence and to investigate the optimal usage of social media platforms for s-commerce purposes. Social commerce has different meaning to different people/businesses. Generally, it is understood as internet-based business activities where businesses and customers use internet for buying and selling and information sharing within online community (Liang and Turban 2011). Occasionally, social commerce is also understood as development of web 2.0 for online communication (between sellers and buyers, between buyers and buyers) that provide interaction opportunities within larger online community and participation in online business activities via online reviews, blogs, etc. social commerce involve extensive use of SNSs to promote interaction among vendors and customers for launching, promotion and transaction purposes. It is interaction between vendors', products and customers' choice (Dennison et al. 2009). Yadav et al. (2013) offered a more comprehensive and practical definition of social commerce that "s-commerce as exchange-related activities that take place between and are influenced by social network users in computer-mediated social environments, where the activities correspond to the need recognition, pre-purchase, purchase, and post-purchase stages of a focal exchange" (Busalim 2016, p. 1077). Curty and Zhang (2011) defined s-commerce in terms of activities through which individual shop or explore shopping opportunities in an online environment.

As development of web 2.0 technology offers more informed and interactive collaboration opportunities, this enhances the evaluation of products and services. Growth of s-commerce is closely related to the social media usage which entails more business opportunities (Hajli 2015). Social media has become a competitive business tool to achieve marketing objectives. It has become usual practice by the firms to have their own online fan pages and Facebook pages to closely interact with the customers for more sustainable customer relationship. S-commerce has revolutionized ways of interaction between businesses and customers and thus offers business to search for innovative ways of transforming their business strategies and generate greater revenue in digital business environments. Accordingly, social commerce research has grown significantly over the last few years as a main domain of research in social media and has significantly impacted the business strategies and practices. Similarly, scholars in information system research have paid enough attention to the development of s-commerce research to enhance the adoption of s-commerce for better business (e.g., Liang and Turban 2011; Wang and Zhang 2012; Zhang et al. 2014).

In simple form s-commerce is an electronic word of mouth (e-WOM) (Dennison et al. 2009), however, a more comprehensive definition was presented by Parise and Guinan (2008) that s-commerce is a kind of more interactive and collaborative way of doing business in an online environment. S-commerce aligned the developments in web 2.0 with the recent business trends by adding value through content generation by the customers. It is mainly the application of social media to reshape and transform ways of doing business i.e. transformation from physical to virtual markets.

Social commerce is not restricted to the business studies and computer science, but it also encompasses other social science disciplines such as psychology, sociology to add diversity in the field. For example, as a marketing strategy, there are noticeable trends in s-commerce to align social media and web 2.0 as a marketing tool to facilitate customer's purchase decision-making process and influence his/her buying behavior (Constantinides et al. 2008). Similarly, in case of sociology, s-commerce is more related to interaction with online communities and focuses on the influence of social values and culture on behavior and interaction among the online community of customers, because social values and culture are considered major factors to inform individuals' behavior, in this case online shopping behaviors (Kim and Srivastava 2007). In terms of psychology, customers are influenced by the relevant information (in this case online information) from the other customers in their online social networks when they make online buying decision. s-commerce seeks to benefit from the field of psychology in developing online contents to influence customers (Marsden 2009).

Huang and Benyoucef (2013) presented social commerce design model which is depicted in the following figure. This model constitutes four layers including individual, community, conversation, and commerce (p. 253). The first layer represents 'individual' which Huang and Benyoucef called 'the self.' Individuals interact with others because such interaction provides them with more learning opportunities. This layer originates the product related (reviews, comments, posting) and individual (customer) related information (individual profile, context profile, activity profile). The next layer is 'conversation.' This means that individuals (customers) exchange information and engage in conversation with others. They share their thoughts and experiences through posting and reviews. Conversation causes to generate more information through user-generated contents and promotes collective wisdom. This layer mainly focuses on content creation, contents presentation, and information sharing. Next comes the 'community layer.' Community layer accounts for community support, connection between community members and relationship maintenance. These three components of community layer are dependent on conversation layer. Stronger conversation between community members promotes support, connection, and relationship between community members. The last and fourth layer is commerce layer that provides opportunities to initiate commerce (business) activities within community. The basic purpose of s-commerce is to create balanced relationship between community and individuals.

5   Trends in Social Commerce Research

Since the introduction of the term 'social commerce' it is largely driven by practice and less research has been taken to explore various related aspects of social commerce. Social commerce helps businesses to reach globally and geographically spread diverse customers more efficiently. Businesses secure more feedback with less cost and integrate such feedback into their marketing strategy to effectively

meet customers' needs (Wang and Zhang 2012). Social commerce not only facilitates businesses but also promotes collaboration between the customers to exchange product relevant information to make more informed and wise purchase decision. In this way, social commerce influences customers' buying behaviors. Social science studies have found that customers carry their social networks along with them and hence there is a major formation of social networks. This allows businesses to disseminate information to larger online communities without bearing extra cost to access potential customers (Marsden 2010). Because there are fewer barriers to entry to online markets, businesses can easily switch to online mode with the adoption of internet technology. If it is used efficiently, social commerce can give firms competitive advantage through improved marketing operations and customer relationship. With the development of information technology and related security and privacy concern, it may take some time for firms to reap the advantages of social commerce. Customers do not make instant online purchases even if they are inspired from others' experiences. To get more customers buy online products, firms need to introduce online promotion programs. For example, it has been noticed that the largest online coupon company 'Groupon' regularly offers some discounts on products to attract more customers. One potential disadvantage of these promotions is that customers may doubt the sustainability of social commerce business model and other businesses become reluctant to the adoption of social commerce as way of doing business. For example, in past these doubts cost decline in stock price of 'Groupon' (Bhattacharjee and Oreskovic 2012) which caused decline in investment in social commerce.

However, despite the potential hazards and security concerns, social commerce has grown rapidly due to the increased use of social media platforms by the potential customers. A number of studies have been conducted to carry out the detailed analysis on various aspects of social commerce. It has been found that there is a constant and regular evaluation of the social commerce and businesses are accepting it as more viable way of doing business. The development of social commerce has asked for restructuring of the e-commerce with major emphasis on finding out new business strategies for state-of-the-art solution to customers' problems and secure competitive advantage in global digital economy. Digitalization of economic activities has become need of the hour to offer a solution to many of the socio-economic problems. This offers ample opportunities for businesses to adopt to social commerce to sustain their market share. Digitalization of economic activities asks businesses to redefine their business strategies and business models to enrich online social experience of the customers and build online networks for sustainability purposes. These online social networks are mandatory to the growth and survival of the social commerce and help businesses to bring innovation and creativity not only in their products but in other business operations. It is important to learn that social commerce is not just an integration of online and offline business activities or restructuring of e-commerce. The development opportunities and potential challenges to social commerce (e.g., digital economies, cybercrimes, online threats, hacking, etc.) ask for more research studies to explore ways of securing and promoting social commerce.

6 Online Advertising and Customer Purchase Intentions

The recent developments in information technology and its wider usage have made 'internet' an as assets to secure competitive advantage. We are living in an era where 'internet' has become an unavoidable part of daily life. We are developing smart cities, smart transport and smart gadgets, smart shopping, smart homes, etc. where everything is connected through internet to make life easier. IoT (Internet of Things) has become talk of the day. Internet has provided businesses with more efficient and effective ways of collecting information to understand diverse customers' need and design their products and services accordingly. The recent introduction of web 2.0 has revolutionized the digital world. Nowadays businesses heavily rely on internet as a cost efficient and effective tool for devising their marketing strategies (Momtaz et al. 2011). Advertising is considered one major component of a business's marketing strategy and success of marketing strategy is largely dependent on effective advertising campaign. With the increase in internet and web usage as a major communication mechanism worldwide, online advertisement has become most powerful marketing tool. Companies focus more on online advertising as a part of their marketing strategy. Online advertising is considered to stimulate customers' purchase intentions more than any other marketing tool. Commercial websites provide businesses with online advertising facility and serve as major source of revenue for these commercial websites (Singh and Srivastava 2020; Rubab et al. 2018). Accordingly, more research studies are being carried out to evaluate the different aspects of online advertising which relate to customers' purchase intentions. For example, many of the studies have focused on the 'quality of online reviews and customers' purchase intentions thereby stating that with more positive online review there is likelihood of increasing customers' purchase intentions. In an earlier study on the impact of practical benefit of online advertising on customers' purchase intentions, it was found that there is a greater impact of online adverting on customers' purchase intentions. This study also revealed that online advertising promotes product acceptance behavior among the customers more than other traditional advertising techniques (Ajina 2019).

Customers' online reviews are always important to influence customers' purchase intention. One form of review is called e-WOM. It refers to statements made by the customers about a product and is available to large number of customers through online platforms. e-WOM significantly influences the purchase intention and subsequent purchase decision of potential customers. It has been found that with the growth of online technology customers rely more on the opinions of other customers to make purchase decision. Online social media platform provides customers with the space to write their opinion and share their product experiences with other customers. This constitutes a major factor to influence the purchase intention of the potential customers (Lee et al. 2008). For example, e-WOM has been found to have a significant impact on purchase (Tseng et al. 2013). This study revealed that positive e-WOM is positively related to customers' purchase intentions and has more influence than the ads. This asks vendors to encourage customers to share their product experiences

to access more customers in an online environments. Vendors must develop more interactive online ads to engage more customers' props, vlogs, and short ads can be more useful in this regard. Similar findings were reported by Nielsen (2013) in global survey of trust advertising and found that majority of customers (78%) rely on other customers' feedback and e-WOM to make purchase decision.

Positive e-WOM is linked positively with the purchase intentions and has greater effects on purchase intentions as compared to ads. In this way, it is more desirable to motivate customers to share their online experiences and product reviews rather than sharing ads. Also, firms need to develop more interactive and more engaging online ads to seek the attention of potential customers. We have commercial website which offers rich media tools and interactive channels to access global customers. Balakrishnan, Dahnil, and Yi (2014) conducted a study to investigate the impact of social media marketing toward brand loyalty and purchase intentions among generation 'Y.' The study found that e-WOM, online communities, and online advertisement have become popular and powerful tools to advertise the products. It was also found that the generation Y is more interested to engage with and give their feedback through social media rather than using traditional ways. The study argued that because of social media liking among generation Y, social media is more influential tool toward purchase intentions among generation Y. Laksamana (2018) conducted a study to investigate the impact of social media marketing on purchase intention among Indonesian banking sectors. Banking sector heavily relies on information technology and social media tools to give 24/7 access to customers. In this way, social media marketing is being excessively used by banking sector to disseminate products and services related information among the customers. The study found that social media marketing significantly influences purchase intentions. This is because social media offers two-way communication between bank and customers. The study also recommended that banks should avoid social media marketing with overloaded information because it poses challenge to communicate and engage the customers and also customers may get irritated with overloaded information. The banks can generate the positive impact of social media marketing only if such marketing campaign is accompanied with interactive, entertaining, and customized advertisement.

It has been estimated that there were almost 4.48 billion social media users around the world in 2021. This was 13.13% more than the previous year 2020 which was 3.69 billion. With this massive increase in social media users, companies find it more convenient to promote their brands. Social media offers companies frequent communication with the customers with more participation of customers in strategizing the companies' marketing programs. A close interaction with the existing and potential customers allows companies to positively communicate their products and influence customers' purchase intentions. Social media marketing can trigger entry of more customers into online view of products and services and generate positive attitude toward products and services. Social media marketing also positively influences e-WOM. A positive e-WOM positively influences other customers. e-WOM is considered as a major factor to influence the customers' purchase intention and subsequent purchase. Earlier studies have shown that e-WOM is an important mean for the potential customers to obtain more relevant information about the quality of online

products and services to make more informed purchase decision. Positive e-WOM can help reduce the risk and uncertainties associated with online purchases and thus positively influence purchase intentions. Social media offers multiple choices to the companies. It is not only communication tool but also a relational and promotional one as well which is considered to be a perfect platform to offer products and services and to seek reviews and feedback for more improvements. The positive communication and interaction promote positive customers' attitude and develop stronger brand commitment and purchase intentions (Hutter et al. 2013). In a study on brand liking and brand equity, it was revealed that social media advertisement positively influences purchase intentions in e-commerce industry. A recent study of Aji, Nadhila, and Sanny (2020) on the effect of social media marketing on Instagram toward purchase intention among Instagram users in Indonesia concluded that social media has become a preferred communication platform to share behaviors, attitudes, preferences, opinions, feedback, feelings, and reviews. An online interactive environment offers companies more opportunities to place their product to match the customers' needs and preferences. The results of the study confirmed that there is a significant effect of social media marketing activities in developing and promoting positive e-WOM and purchase intentions. Firms are able to attract and retain customers through efficient and attractive use of social media marketing tactics. The study argued that with more focus on Instagram, companies can increase their brand awareness and influence positive purchase intentions. To increase their profit, companies must focus on expanding their customer-base and online networks. Companies must know the significance of Instagram as a powerful social media tool to influence customers' purchase intention by developing positive attitude toward product. Facebook is also another widely used social media platform. Like other social media channels, Facebook also offers interactive opportunities to both customers and firms. It gives options to customers, for example, 'like,' 'dislike,' 'share,' and to view whether others have liked or shared it. Studies suggest that Facebook helps evaluate product or brand credibility. Lee and Kim (2022) argued that customers view messages generated by the other customers on Facebook and other social media and such messages have more influence to motivate the potential customers. In today's competitive market, the success or failure of a business is largely dependent on public image and perception. The success of an advertising program must be measured by evaluating the customers' interest developed through (online) advertisement. Facebook help to viral product advertisement. This invites the companies to invest in online/social media marketing activities and target potential customers through customized advertisement on social media platforms (Facebook, Twitter, Instagram, etc.) (Smock et al. 2011). Social media advertisement needs to be trust-based to secure more market share. Trust-based social media advertisement helps companies to engage customers more effectively and to stimulate the positive e-WOM (Kim and Niehm 2009; Kaplan and Haenlein 2010).

Dehghani and Tumer (2015) conducted a study to determine the effectiveness of Facebook advertising on enhancing purchase intentions of the consumers. The study found a high correlation between Facebook advertising, brand equity, and brand image which influence purchase intentions. The study argued that Facebook

facilitates in obtaining and exchanging relevant information between companies and customers and also among customers which enhances public participation in Facebook promotion of the products and services. The study concluded that Facebook, through spreading e-WOM and viral advertisement, helps build brand image and equity which enhance consumers' purchase intentions. Chetioui, Buttb, and Lebdaouia (2021) proposed a framework to explain the effect of Facebook advertising on customers' purchase intentions. The framework suggests that three components of Facebook advertising (credibility, informativeness, and entertainment) influence perceived value of the product and e-WOM. e-WOM also influences the perceived value. Both perceived value and e-WOM in turn influence attitudes toward Facebook advertisement, which in turn effect consumers' purchase intentions. Their framework is built on the basis of 'theory of planned behavior' which argues that attitudes, subjective norms, and perceived behavioral control together inform and develop behavioral intentions. Purchase intention is considered as an important component of the theory. There are numerous studies (e.g., Dehghani et al. 2016; Permatasari and Laydi 2018; Yang et al. 2016) which studied the relationship between attitudes and intentions. The invasive social media ads bear negative consequences in terms of negative attitudes toward the consumers and thus cause unfavorable behavioral outcomes, i.e., negative purchase intentions. Other studies argue that positive consumers' attitude toward online ads results into positive intention to make purchase.

Logan et al (2012) concluded that informativeness and entertainment are the two important factors which enhance the worth and accessibility of online advertising. They also found a significant relationship between value of advertisement and customers' attitude toward online advertising. Similar results were reported by another study that informativeness and entertainment are the two important characteristic features of online ads (Saxena and Khanna 2013). In a similar kind of study, it was noted that information rich and creative advertisements have significant impact on customers' responsiveness toward online ads that they are more intended to make purchase (Lee and Hong 2016). Wu, Li, and Chang (2016) examined that customer's habit is also an important factor which shape customers' perception and behavior toward online ads. It was found that customer's habitual behavior toward online ads increases the chances of actual purchase. Habit influences customer's behavior in three ways (i.e., perception of easiness of use, joy, and expediency) which results into actual purchase. It has also been witnessed that habit can overcome the negative behavior toward social media ads and can develop positive perceptions about such ads through regular visits of social media platforms. Relevancy has been another important factor which determines the customers' attitude toward online ads. In one recent study, it was concluded that relevancy is significant to predict customers' attitude toward online ads (Jung 2017). It has been contended that customers pay more attention and interest to those ads which they perceive as more relevant to their requirements. However, customers ignore such ads when they have privacy concerns if the ads are relevant (Jung 2017). Privacy and invasiveness have been found to have significant negative effect on the customers' perception about usefulness, ease of use, and behavior toward online advertisement (Lin and Kim 2016). Lin and Kim also studied the effects of ad usefulness on customers' behavior and intention to

make purchases and found sufficient evidence about the stated relationship. Similar results were reported by Boateng and Okoe (2015) that customers' attitude is critical toward purchase intention and subsequent purchase. They further concluded that the relationship between customers' attitude toward online ads and purchase intention is influenced by the reputation of the organization.

7 Discussion

Businesses around the globe are constantly looking for new ways to extend their customer outreach. It has not been much time when the traditional media like television, radio, newspaper were the major component of companies' marketing strategies. Then came the era of information technology (social media, web 2.0) which altogether changed the landscape of companies' marketing programs. In recent times, companies rely less on the traditional media for promoting their products and services. The concept of digital or online advertising has come up with novel ways to engage and interact with customers. Companies are bringing newness and innovativeness in the use of social media online platforms to have competitive advantage. Companies are focusing more on the effective and efficient use of social media to communicate their brand image and influence consumer attitudes. Positive consumer's attitude positively influences customer's purchase intentions. An integrated approach toward use of social media as a component of marketing strategy has become mandatory for the companies. Social media provides an added benefit of spreading the product information to larger online community with less cost in form of reviews, feedback, and e-WOM. Among these, e-WOM is of particular interest and importance. Scholars are interested in knowing that how the e-WOM has developed on social media (Jalilvand and Heidari 2017). e-WOM helps product promotion through value creation which subsequently influences customers' purchase intentions; e-WOM is believed to significantly inform and shape the consumer's attitude and purchase intentions (Srivastava and Sharma 2017; Jalilvand 2017). Online advertising has some explicit benefits such as value creation, dissemination of information, precise and relevant contents, and increased participation of customers in shaping the marketing strategies for product promotion. One of the core components of marketing strategy is that businesses need to consider the ways for enhancing the customers' online shopping experience. Online advertising allows companies to share products and services related information which can be readily accessed by customers. The more detailed information about the product/service means that it has greater chance to be known by more customers (Astuti and Asih 2021; Budiman 2021). Consumers are attracted and convinced by the way products are placed and contents are presented via online advertising. Companies need to make online advertising contents more attractive, informative, and easily accessible.

8 Conclusion

In recent years, social media has become a powerful and reliable source of product information for the consumers. With the development of web 2.0 technology, companies are seeking new ways to promote their businesses online. Companies are investing more amount to benefit from online channels to advertise their products and services. Online advertisement is replacing traditional advertisement through television, radio, and newspapers. Online advertising facilitates both customers and the companies to easily and readily access the requisite information to make informed decisions. It also provides an interactive opportunity to customers and businesses for better online experiences. In recent times, we have a concept of online communities. Online community represents the group of customers who share common interests. There are stronger online networks between online community members, and they rely heavily on the information provided by the other members to make online shopping. The reviews and the feedback from community members significantly influence the customers' attitudes and intentions toward online available products and services. As discussed above that there are numerous studies which have documented the strong relationship between online advertisement and customers' purchase intentions. These studies have been carried out among varied customers inhibited in various locations and considering the various products. There is no difference in the way that online advertising affects customers' attitudes and purchase intentions. The everyday invention in the use of information technology is providing businesses with an opportunity to use online platform efficiently and effectively to promote their products and to reach the geographically widespread customers with minimal cost and effort. Businesses are hiring social media and online marketing specialists to better align their online advertising campaign which look attractive, interactive, informative, appealing, and more engaging to the customers. Customers view several online advertisements when they are online. It has become challenging for the companies to offer online contents which can easily catch customers' attention and stimulate their purchase intention. Online advertising should be more friendly and reflective of both companies' and customers' interests. It should not only focus on the product/service characteristics but also capture the psychological factors which influence customers' attitudes and purchase intentions. Online advertising must take care of psychological, social, and economic needs of customers and should be more appealing in their contents. Additionally, in recent times due to rising fuel cost, prices are rocketing high. Cost for companies and customers is increasing. Under these circumstances of rising fuel prices, it is becoming difficult both for the companies and customers to physically access the markets. Hence, preferred way to access is online. Companies prefer to offer products and services online to reduce supply chain and other related costs. Similarly, customers prefer to make online shopping to avoid the unnecessary costs. Online advertising is bringing companies and customers closer to meet their respective needs. Companies need to invest not only in online advertising but also allocate enough budget for research and development initiatives to find new ways for online promotion of their products. Social commerce is becoming a way of doing

business. Companies need to benefit from the research in social commerce. Social commerce has become an emerging research area for the scholars and in the recent past a handful number of studies have been conducted to highlight the significance of social commerce both for the companies and customers. Social commerce has become inevitable to secure competitive advantage and companies need to invest more in social commerce activities. In conclusion, it is stated that companies need to divert their traditional advertising programs to online programs and need more attention to develop the contents of online advertisement to extend their market networks and offer competitive products/services at competitive prices, possibly the only way to survive in digital market.

References

Aji P, Nadhila V, Sanny L (2020) Effect of social media marketing on Instagram towards purchase intention: evidence from Indonesia's ready-to-drink tea industry. Int J Data Network Sci 4(2):91–104

Ajina A (2019) Predicting customers' online word of mouth intention: the theory of planned behavior applied to understand youth Saudi social media behaviors. Manag Sci Lett 9(10):1553–1566

Akel G, Candan G (2022) Adoption of online advertising by small and medium enterprises. In:Moving businesses online and embracing E-commerce: impact and opportunities caused by COVID-19 (pp. 180–198). IGI Global.

Alalwan AA (2018) Investigating the impact of social media advertising features on customer purchase intention. Int J Inf Manage 42:65–77

Amblee N, Bui T (2011) Harnessing the influence of social proof in online shopping: the effect of electronic word of mouth on sales of digital microproducts. Int J Electron Commer 16(2):91–114

Astuti Y, Asih D (2021) Country of origin, religiosity and halal awareness: a case study of purchase intention of Korean food. J Asian Finance Econ Bus 8(4):413–421

Athey S, Calvano E, Gans J (2013) The impact of the internet on advertising markets for news media (No. w19419). National Bureau of Economic Research.

Bagwell K (2007) The economic analysis of advertising. In: Armstrong M, Porter R (eds) Handbook of industrial organization, vol 3. North-Holland, Amsterdam, pp 1701–1844

Bakos J (1997) Reducing buyer search costs: implications for electronic marketplaces. Manage Sci 43(12):1676–1692

Balakrishnan BK, Dahnil MI, Yi WJ (2014) The impact of social media marketing medium toward purchase intention and brand loyalty among generation Y. Procedia Soc Behav Sci 148:177–185

Barbu CM, Ponea Ş, Bogdănoiu CL (2019) Offline advertising versus online advertising. Theor Pract Res Econom Fields 10(2 (20)), 118–131

Bernoff J, Li C (2011) Effects of brand attitude and familiarity. J Mark 59(1):63–77

Bhattacharjee N, Oreskovic, A (2012). Analysis: groupon fights for its life as daily deals fade. Reuters, November 12, 2012.

Boateng H, Okoe AF (2015) Consumers' attitude towards social media advertising and their behavioural response: the moderating role of corporate reputation. J Res Interactive Mark.

Budiman S (2021) The effect of social media on brand image and brand loyalty in generation Y. J Asian Finance Econ Bus 8(3):1339–1347

Budzinski O, Lindstädt-Dreusicke N (2020) Antitrust policy in video-on-demand markets: the case of Germany. J Antitrust Enforc 8(3):606–626

Busalim AH (2016) Understanding social commerce: a systematic literature review and directions for further research. Int J Inf Manage 36(6):1075–1088

Casalo L, Flavian V, Guinaliu C, M. (2007) The influence of satisfaction, perceived reputation and trust on a consumer's commitment to a website. J Mark Commun 13(1):1–17

Chetioui Y, Butt I, Lebdaoui H (2021) Facebook advertising, eWOM and consumer purchase intention-evidence from a collectivistic emerging market. J Glob Mark 34(3):220–237

Constantinides E, Romero CL, Boria MAG (2008) Social media: a new frontier for retailers? In:European retail research. Gabler Verlag, Wiesbaden, pp 1–28

Curty RG, Zhang P (2011) Social commerce: looking back and forward. Proc Am Soc Inf Sci Technol 48(1):1–10

Danaher PJ, Mullarkey GW (2003) Factors affecting online advertising recall: a study of students. J Advert Res 43(3):252–267

Dehghani M, Tumer M (2015) A research on effectiveness of Facebook advertising on enhancing purchase intention of consumers. Comput Hum Behav 49:597–600

Dehghani M, Niaki MK, Ramezani I, Sali R (2016) Evaluating the influence of YouTube advertising for attraction of young customers. Comput Hum Behav 59:165–172

Dennison G, Bourdage-Braun S, Chetuparambil M (2009) Social commerce defined. White paper, 23747.

Dwivedi YK, Rana NP, Tajvidi M, Lal B, Sahu GP, Gupta A (2017, March). Exploring the role of social media in e-government: an analysis of emerging literature. In:Proceedings of the 10th international conference on theory and practice of electronic governance (pp. 97–106)

Everson A (2014) Five big social media trends for 2014.

Forman C, Ghose A, Goldfarb A (2009) Competition between local and electronic markets: how the benefit of buying online depends on where you live. Manage Sci 54(1):47–57

Frick V, Matthies E, Thøgersen J, Santarius T (2021) Do online environments promote sufficiency or overconsumption? online advertisement and social media effects on clothing, digital devices, and air travel consumption. J Consum Behav 20(2):288–308

Friedrich T (2015) Analyzing the factors that influence consumers' adoption of social commerce–a literature review.

Ghose A, Ipeirotis P (2009) The EconoMining project at NYU: studying the economic value of user-generated content on the internet. J Revenue Pricing Manag 8(2):241–246

Ghose A, Yang S (2009) An empirical analysis of search engine advertising: sponsored search in electronic markets. Manage Sci 55(10):1605–1622

Goldfarb A (2014) What is different about online advertising? Rev Ind Organ 44(2):115–129

Goldfarb A, Tucker C (2011a) Privacy regulation and online advertising. Manage Sci 57(1):57–71

Goldfarb A, Tucker C (2011b) Search engine advertising: channel substitution when pricing ads to context. Manage Sci 57(3):458–470

Goldfarb A, Tucker C (2011c) Substitution between online and offline advertising markets. J Compet Law Econ 7(1):37–44

Goldfarb A, Tucker C (2012) Shifts in privacy concerns. Am Econ Rev Papers Proceedings 102(3):349–353

Gordhamer S. (2009). 4 ways social media is changing business. New York: Mashable.

Hajli MN (2014) The role of social support on relationship quality and social commerce. Technol Forecast Soc Chang 87:17–27

Hajli N (2015) Social commerce constructs and consumer's intention to buy. Int J Inf Manage 35(2):183–191

Hajli N, Sims J (2015) Social commerce: the transfer of power from sellers to buyers. Technol Forecast Soc Chang 94:350–358

Hassanein K, Head M (2007) Manipulating perceived social presence through the web interface and its impact on attitude towards online shopping. Int J Hum Comput Stud 65(8):689–708

He J, Shao B (2018) Examining the dynamic effects of social network advertising: a semiotic perspective. Telematics Informatics 35(2):504–516

Hollis N (2005) Ten years of learning on how online advertising builds brands. J Advert Res 45(2):255–268

Howe J (2006) The rise of crowdsourcing. *Wired Magazine* 14(6):1–4

Huang Z, Benyoucef M (2013) From e-commerce to social commerce: a close look at design features. Electron Commer Res Appl 12(4):246–259

Hutter K, Hautz J, Dennhardt S, Füller J (2013) The impact of user interactions in social media on brand awareness and purchase intention: the case of MINI on Facebook. J Product Brand Manag.

Jalilvand MR (2017) The effect of innovativeness and customer-oriented systems on performance in the hotel industry of Iran. J Sci Techn Policy Manag.

Jalilvand MR, Heidari A (2017) Comparing face-to-face and electronic word-of-mouth in destination image formation: the case of Iran. Inf Techn People.

Jăscanu N, Jăscanu V, Nicolau F (2007) A new approach to E-commerce multi-agent systems. *The annals of "Dunarea de Jos "University of Galati*. Fascicle III, Electrotechnics, Electronics, Automatic Control, Informatics 30:11–18

Jung AR (2017) The influence of perceived ad relevance on social media advertising: an empirical examination of a mediating role of privacy concern. Comput Hum Behav 70:303–309

Jung J, Shim SW, Jin HS, Khang H (2016) Factors affecting attitudes and behavioural intention towards social networking advertising: a case of Facebook users in South Korea. Int J Advert 35(2):248–265

Kang YR, Park C (2009, February) Acceptance factors of social shopping. In:2009 11th international conference on advanced communication technology (Vol. 3, pp. 2155–2159). IEEE.

Kaplan AM, Haenlein M (2010) Users of the world, unite! the challenges and opportunities of social media. Bus Horiz 53(1):59–68

Keller E, Fay B (2009) The role of advertising in word of mouth. J Advertising Res 49(2):154–158.

Kim AJ, Ko E (2010) Impacts of luxury fashion brand's social media marketing on customer relationship and purchase intention. J Glob Fash Market 1(3):164–171

Kim D (2012, May) Marketing games in social commerce. In:International conference on game theory for networks (pp. 125–137). Springer, Berlin, Heidelberg.

Kim G, Moon I (2020) Online banner advertisement scheduling for advertising effectiveness. Comput Ind Eng 140:106226

Kim H, Niehm LS (2009) The impact of website quality on information quality, value, and loyalty intentions in apparel retailing. J Interact Mark 23(3):221–233

Kim N, Kim W (2018) Do your social media lead you to make social deal purchases? consumer-generated social referrals for sales via social commerce. Int J Inf Manage 39:38–48

Kim YA, Srivastava J (2007, August) Impact of social influence in e-commerce decision making. In:Proceedings of the ninth international conference on electronic commerce (pp. 293–302).

Kotler P, Pfoertsch W, Michi I (2006) B2B brand management (Vol. 357). Berlin: Springer.

Laksamana P (2018) Impact of social media marketing on purchase intention and brand loyalty: evidence from Indonesia's banking industry. Int Rev Manag Mark 8(1):13–18

Leckner T, Schlichter J (2005). Information model of a virtual community to support customer cooperative product configuration. In:11th International Conference on Human-Computer Interaction (pp. 10–111)

Lee J, Hong IB (2016) Predicting positive user responses to social media advertising: the roles of emotional appeal, informativeness, and creativity. Int J Inf Manage 36(3):360–373

Lee J, Kim S (2022) Social media advertising: the role of personal and societal norms in page like ads on Facebook. J Mark Commun 28(3):329–342

Lee J, Park DH, Han I (2008) The effect of negative online consumer reviews on product attitude: an information processing view. Electron Commer Res Appl 7(3):341–352

Leitner P, Grechenig T (2007a) Community driven commerce: design of an integrated framework for social shopping. In:IADIS International Conference E-Commerce 2007a (pp. 353–356).

Leitner P, Grechenig T (2007b) Next generation shopping: case study research on future E-commerce models. In:IADIS International Conference E-Commerce, Algarve, Portugal, 5–312

Leitner P, Grechenig T (2008a) Collaborative shopping networks: sharing the wisdom of crowds in ecommerce environments. 21st Bled eConference eCollaboration, Bled, Slovenia, 15–321.

Leitner P, Grechenig T (2008b) Consumer centric communities: integrating community-based features into online shops. International Conference on Web Based Communities (IADIS), Amsterdam, 3–273.

Lewis RA, Rao JM, Reiley DH (2011, March) Here, there, and everywhere: correlated online behaviors can lead to overestimates of the effects of advertising. In Proceedings of the 20th international conference on World wide web (pp. 157–166).

Lewis RA, Rao JM (2012) On the near impossibility of measuring advertising effectiveness working paper.

Liang TP, Turban E (2011) Introduction to the special issue social commerce: a research framework for social commerce. Int J Electron Commer 16(2):5–14

Liang TP, Ho YT, Li YW, Turban E (2011) What drives social commerce: the role of social support and relationship quality. Int J Electron Commer 16(2):69–90

Lin CA, Kim T (2016) Predicting user response to sponsored advertising on social media via the technology acceptance model. Comput Hum Behav 64:710–718

Liu L, Cheung CM, Lee MK (2016) An empirical investigation of information sharing behavior on social commerce sites. Int J Inf Manage 36(5):686–699

Liu YH, Yih JS, Pinel F (2005, July) Collaborative gift registry in multi-channel retail commerce. In:Seventh IEEE International Conference on E-Commerce Technology (CEC'05) (pp. 176–180). IEEE.

Logan K, Bright LF, Gangadharbatla H (2012) Facebook versus television: advertising value perceptions among females. J Res Interact Mark.

Malheiros M, Jennett C, Patel S, Brostoff S, Sasse MA (2012, May) Too close for comfort: a study of the effectiveness and acceptability of rich-media personalized advertising. In:Proceedings of the SIGCHI conference on human factors in computing systems (pp. 579–588).

Mangold WG, Faulds DJ (2009) Social media: the new hybrid element of the promotion mix. Bus Horiz 52(4):357–365

Marsden, P. (2009). How social commerce works: The social psychology of social shopping. Social Commerce Today.

Marsden, P. (2010). A new age of enlightenment. Mark, 11.

Mohammed AB, Alkubise M (2012) How do online advertisements affect consumer purchasing intention: empirical evidence from a developing country. European J Bus Manag 4(7):208–218

Momtaz H, Islam MA, Ariffin KHK, Karim A (2011) Customers satisfaction on online shopping in Malaysia. Int J Bus Manag 6(10):162

Muñoz- F, Hernández-Méndez J, Gómez-Carmona D (2019) Measuring advertising effectiveness in travel 2.0 websites through eye-tracking technology. Physiol Behav 200:83–95

Nielsen (2013) Nielsen global survey of trust in advertising. Nielsen. Retrieved from http://www.nielsen.com

Opreana A, Vinerean S (2015) A new development in online marketing: introducing digital inbound marketing. Expert J Mark, 3(1).

Parise S, Guinan PJ (2008, January) Marketing using web 2.0. In:Proceedings of the 41st annual Hawaii International Conference on System Sciences (HICSS 2008) (pp. 281–281). IEEE.

Permatasari A, Laydi F (2018) The effects of social media advertising on consumer purchase intention: a case study of Indonesian family start-up enterprises. Int J Technol Transf Commer 16(2):159–172

Rubab N, Shoukat S, Shaheen M, Sandhu KY (2018) The impact of website designing factors on online purchase intention: evidence from fashion brands. IUP J Mark Manag 17(1):53–72

Saxena A, Khanna U (2013) Advertising on social network sites: a structural equation modelling approach. Vision 17(1):17–25

Singh S, Srivastava RK (2020) Understanding the intention to use mobile banking by existing online banking customers: an empirical study. J Financial Services Mark 25(3):86–96

Smock AD, Ellison NB, Lampe C, Wohn DY (2011) Facebook as a toolkit: a uses and gratification approach to unbundling feature use. Comput Hum Behav 27(6):2322–2329

Srivastava D, Sharma RW (2017) Developing a model for studying the antecedents and effects of Word of Mouth (WoM) and e-WoM marketing based on literature review. Jindal J Bus Res 6(1):25–43

Stephen AT, Toubia O (2010) Deriving value from social commerce networks. J Mark Res 47(2):215–228

Surowiecki J (2004) The Wisdom of the Crowds: Why the many are smarter than the few and how collective wisdom shapes business, economies, societies and nations. Doubleday, New York

Tsai J, Egelman S, Cranor L, Acquisti A (2011) The effect of online privacy information on purchasing behavior: an experimental study. Inf Syst Res 22(2):254–268

Tseng C-H, Kuo H-C, Chen J-M (2013) The relationship among advertisement, electronic word of mouth, and purchase intention of virtual community members. Northeast Region Decision Sciences Institute.

Tucker CATHERINE (2019) Online advertising and antitrust: Network effects, switching costs, and data as an essential facility. CPI Antitrust Chronicle, April.

Vegeş RI, Grigore B (2003) Relaţiile publice şi publicitatea online (Public relations and online advertising).

Vij S, Sharma J (2013, January). An empirical study on social media behaviour of consumers and social media marketing practices of marketers. In:5th IIMA conference on marketing in emerging economies.

Wang C, Zhang P (2012) The evolution of social commerce: the people, management, technology, and information dimensions. Commun Assoc Inf Syst 31(1):5

Wigand RT, Benjamin RI, Birkland JL (2008, August). Web 2.0 and beyond: implications for electronic commerce. In:Proceedings of the 10th international conference on electronic commerce (pp. 1–5).

Wolny J, Mueller C (2013) Analysis of fashion consumers' motives to engage in electronic word-of-mouth communication through social media platforms. J Mark Manag 29(5–6):562–583

Wu G (2005) The mediating role of perceived interactivity in the effect of actual interactivity on attitude toward the website. J Interact Advert 5(2):29–39

Wu YL, Li EY, Chang WL (2016). Nurturing user creative performance in social media networks: an integration of habit of use with social capital and information exchange theories. Int Res.

Yadav MS, De Valck K, Hennig-Thurau T, Hoffman DL, Spann M (2013) Social commerce: a contingency framework for assessing marketing potential. J Interact Mark 27(4):311–323

Yang S, Lin S, Carlson JR, Ross WT Jr (2016) Brand engagement on social media: will firms' social media efforts influence search engine advertising effectiveness? J Mark Manag 32(5–6):526–557

Zhang H, Lu Y, Gupta S, Zhao L (2014) What motivates customers to participate in social commerce? the impact of technological environments and virtual customer experiences. Inf Manag 51(8):1017–1030

Intention to Use Social Media Technology Among Customers

Melike Sak, Yavuz Çetin, Ali Turan Bayram, and Gül Erkol Bayram

1 Introduction

The information technologies have increased to change incredibly today. Perhaps, social media is one the most important in the technological developments known as Web 2.0. According to Aydede (2006), the reason for this development is that social media is highly preferred. According to a study conducted in about 240 countries shows that there are 3.8 billion people using the internet in the World and 2.8. billion are actively involved in social media. Social media allows for two-way communication. Social media, which strengthens communication between businesses and customers, is in an intense interaction. Managements present their products and services on their social media using tools such as pictures, videos and texts. In this way, it is closer to its customers and stays in the minds of customers for a longer period of time. Social media offers great opportunities and conveniences to managements in terms of providing rapid and easily feedback, customer service and advertising. Especially since the middlemen are eliminated, the costs are reduced and the products reach the consumer at a more affordable price. Customers buy the product comfortably, easily and at the lowest price. In addition, they can reach information about the product they want to buy in a short time, obtain accurate and objective information about products and companies, read the comments by the people who bought the product and compare different labels and managements. These advantages enable products to be purchased via social media (Tutar et al. 2015).

M. Sak
Department of Travel Management, Selçuk University, Konya, Turkey

Y. Çetin
Department of Tourism Management, Adnan Menderes University, Aydın, Turkey

A. T. Bayram · G. E. Bayram (✉)
Department of Tour Guiding, Sinop University, Sinop, Turkey
e-mail: gulerkol@windowslive.com

With the effect of the increase in people's internet usage rates, businesses have been able to reach more customers in a shorter time. With technological developments, all applications related to products, services and business are now online. This situation has made it easier for businesses to reach new customer groups with technological developments. Customers have started to use online services with this new era. Customer's ability to research the product or service to be purchased and to have information about it before purchasing affects customer relations and purchasing behavior. Both the use of technological developments and sales and after-sales services are factors that positively affect customer relations. The ability to provide online products and services that emerged with the development of technology provides many advantages in the development of customer relations of enterprises.

Being social is a human need. However, with the development of internet technologies in recent years, the concept of socialization has changed in size and shape. Today, being social means being active on the internet in different environments and platforms. This unique world, which is defined as social media, has provided people to communicate among themselves and has turned the world into a global village. It is a general name given to any platform where social media users share the information they wish (Klieber 2009). Social media is an access that occurs when people influence other people (Blossom 2009). Individuals are active on social media. Information on social media is created and disseminated by users. In this way, the liberation and development of knowledge has also become easier (Bekaroğlu 2011). Social media is defined as applications that contain web-based and electronic methods for distributing information. Some examples include LinkedIn, Twitter, Facebook, YouTube, Myspace, blogs, chat rooms, wikis and photo-sharing sites. In recent years, businesses have been using social media sites a lot in customer relations and development (Parveen et al. 2015).

Consumers affect managements positively and negatively with their social media comments. Comments and posts about products sharing customers on social media are read by many people around the world within minutes. For consumers using social media technologies, the first stage in the purchasing process is the consumer's seeing the product. Then he thinks about and evaluates this product. User comments are very effective in the evaluation process. The next step is purchasing. After the product is purchased, it is shared and feedback about the product is sent. This process takes place in a cycle. This loop is called "the social feedback loop" (Uyar 2019). In general, social media marketing is a type of marketing that focuses on people rather than the product. Products are offered by the company with qualitative features and promotional tools whenever possible. At this point, the important thing is the customer's comments and appreciation for the product. People create content about the product they use, and if it is a bad social media content, the product may not be preferred anymore. In this context, social media has a decisive role on management sustainability. Social media is a twenty-first century movement that has replaced traditional marketing with internet-focused marketing. Consumers can share and exchange all product information and documents over the internet and social media tools (Ertemel and Ammoura 2016).

After the literature rievew, it is possible to express that social media is effective on the purchasing decision process. Pate and Adams (2013) emphasized that social media is effective in purchasing decision. Another study by Florez et al. (2017) stated that the comments received from the social media environment and conveyed by word of mouth messages are a guide in the purchasing process. On the other hand, Ioanas and Stoica (2014) state that the Z generation and social media users generally refer to social media before purchasing their products. In addition, it is stated in studies that social media has a stimulating effect (cited by Uyar 2019). According to Kaplan and Flaenlein (2010), user warnings or complaints on social media encourage and promote managements to produce a better product. The Dell brand, taking into account the warnings on Twitter, repaired the faulty parts of its products and produced a better product and experienced a sales increase of $ 1 million. Chanthinok et al. (2015) emphasized that social media is one of the most effective factors in product development and sales. Kumar et al. (2016), on the other hand, emphasized the power of social media on increasing the sales (Trainor 2012). In their research, Hoffman and Fodor (2010) examined the relationship between brand loyalty and social media. Their research has examined the increasing Starbucks comments on Twitter after a coffee-themed advertisement on television. As a result, it has been emphasized that increasing Starbucks sales after a general coffee advertisement may be associated with brand loyalty. Another first attractive result is that the comments of those who do not buy the product but are interested in the brand are effective in the purchase intention of the consumers. For example, a product with a high price and brand value may not have a large customer base. However, if the brand is frequently mentioned on the social media and has a large following population on Twitter, Facebook or Instagram, this brand can be chosen for interested consumers who have enough Money to buy it (Şimşek 2019).

2   Social Media Technologies, Challenges and Opportunities

Social media is the whole of digital platforms that enable their users to collect information, share it, produce their own content, play games and cooperate in the form of groups and communities on the internet. Nowadays, more than 4.5 billion people worldwide are active users of social media. And this number is increasing day by day. Social media, which entered our lives with Web 2.0 after Web 1.0 and continues to develop, has a very important position for individuals, brands, institutions and organizations, politicians and states. As a result of its impact on people and globalization, it has become quite easy to access content on social media where boundaries such as geographical location have been removed. One of the most important features of social media emerges as simultaneous sharing to society and communities. For this reason, this technology that provides information communication and transfer is widely used in our lives. Today, users from almost all walks of life use digital communication channels. Almost everyone from the lower class to the upper class uses digital communication channels all over the world. Social media is a platform

where message exchange takes place based on thoughts and feelings (Miller et al. 2016: 8). As it can be understood from these main definitions, the concept of social media has differences from traditional media in terms of quality and quantity. Social media is a generic name given to online information resources where businesses, brands, users and topics are their relevant users and creators, where they prepare, develop, distribute, control their content and track their feedback. Social media is very easy to learn and use. Being able to be transferred independently of time and place, the interaction potential is at the maximum level. Cross-platform connections can be easily shared and transitions can be provided, easily measurable and providing nearly unlimited participants are among its most important features.

2.1 Social Media Advantages/Opportunities

Nowadays social media constitutes one of the largest sources of information for its users. There are many benefits to businesses, consumers and the business world, from evaluating the products purchased by consumers to receiving feedback, but on the other hand, it is necessary to mention that there are also disadvantages. The main and important advantages of social media will be briefly mentioned below. These advantages have been selected from the most important ones for both businesses, institutions and organizations and users (Kütük 2016):

Low cost: Traditional communication tools can be extremely expensive, especially for small businesses. However, many social media platforms are completely free to use, businesses just spend their time on these social media sites and do not pay any fees. This advantage is seen as the most important benefit of social media as it is accessible to more business owners due to low-cost entry barrier. The low cost of getting into social media makes it particularly useful for small businesses who find the costs associated with traditional media prohibitive. Businesses can use social media to create and distribute promotional materials such as articles, videos and audio at a fraction of the cost of that content appearing in the press, radio or TV.

Unlimited access: Social media is easily accessible to most people, regardless of business size, profits and connections. For this reason, businesses have the ability to act more with social media. Social media is open to everyone. However, it is very difficult to reach the classical communication tools. It also requires cost and time.

Simplicity: Traditional marketing requires a high level of skills, training, expertise and qualifications. Of course, both the traditional and the modern method have some advantages and disadvantages. However, the use of social media is quite simple, and all users need is computer use. So social media communication is quite easy.

Global reach. With the rapid growth of technology, social media has become a situation that can be accessed by everyone from many parts of the world. Social

media should be accessible to everyone. The mass of social media should be global.

Communicating: Social media offers ideal options for real-time, interactive events-related events and communication. Businesses can be prepared for the first use of media, for example, the traditional ones like Facebook, Twitter and so on and the type of ones to post and a preferred choice of options. Social media's business-customer proximity feature also allows for a more open communication instead of just conveying explanation messages.

Flexibility: The adaptability of social media to different terms and situations makes content management more flexible in general. For a print advertisement, magazine article or article, information can be updated, modified, supplemented and discussed in a completely unknown way. In addition, information is published in a very short time, which makes it possible for businesses to ensure that their content is always up to date.

Measurability: While social media statistics can be measured instantaneously, traditional media figures often need to be monitored over a long period of time. With social media, businesses test their marketing messages and approaches and measure the reactions of users. However, their messages also change accordingly. Social media measurement is done with free, useful social media measurement tools.

Entertainment: Consumers browsing online shopping sites shop with the aim of "solving problems or having fun", "realizing their joyful dreams and fantasies" or "getting emotional pleasure and pleasure". It is known that researchers still try to observe and examine the purchasing behaviors of customers based on the emotional experiences they have during shopping and the activities they are satisfied with, even for customers who act directly for a specific purpose. As a result of these research, it has been revealed that shopping, especially for entertainment and pleasure, is seen as a means of evaluating spare time (Güven 2013).

Customer service performance: Keeney (1999) argues that buyers attach importance to both customer support and after-sales service quality. Online or social media buyers expect to find quick and easy answers to all questions that may arise in their minds during or after shopping, and to any problem they may encounter. Meeting these expectations in a best way is an important factor which will enable the customer to continue shopping in a healthy way and to shop from the same online sales channel again.

Order Fulfillment Performance: In the new structure where the customer base is very large, but demand forecasting is difficult, it is of great importance that the product and information synchronization be successfully implemented and the customer satisfied. As soon as the consumer enters the order, he expects the product to be supplied, to have stock to meet it, and to receive the product he ordered at the time he wants or within the promised time frame. In addition, customers pay a certain amount of money for products or services that e-retailers have to deliver. For this reason, they want retailers to meet this expectation smoothly and well (Cavlak 2012).

Information Quality: In online purchases, customers have to buy the product without testing it. For this reason, they expect to be presented with satisfactory information about what kind of product they will encounter. By presenting rich and accurate information, customers are encouraged to shop online by finding answers to their questions. Liu and Arnett (2000), describe the wealth of knowledge; price information, product/service comparison,product/service differentiation and product/service.

Ease of Shopping: Ease of shopping refers to people's perception of how much impact a particular system will have on their job performance. One of the reasons why consumers use this new shopping environment in online shopping is their expectations and beliefs that they will have a better shopping experience. In order to provide ease of shopping, consumers' expectations from businesses such as designing the website in a way that is easy to read and not requiring complex operations, ordering processes to be not difficult and troublesome and direct access to the desired product or service are at the forefront. Therefore, as the convenience is provided, it is assumed that the expected and perceived benefit will increase, while the intention to use will increase (Yaman 2018).

Security/Privacy: One of the most disturbing situations related to security and privacy issues is experienced during the payment process. Payments for online sales are mostly made by credit cards, which somehow raises high concerns about security. Even though many of the online shopping channels have secured their transaction security with encryption systems such as SSL, customers expect a service that they can trust more and more every day. According to Jackson (2015), social media platforms can offer some advantages to their users:

- Social media can create a meeting space. When trying to schedule meetings with colleagues or friends, accessing social networking platforms expands available times and places for meetings. You can choose social media channels to gather, people can meet and chat on Facebook or open a video chat on Google.
- In traditional ways, communicating with our family members is so difficult. But in modern era, it is possible to contact with social media platforms easily. Also, we can share our daily life safely.
- *We can create a professional networking via social media for* professionals and academics allow users to create networks of like-minded people.
- People who use social media channels share their ideas, thoughts, comments on a news, products, etc. People on social media is so aware of trends, current issues and many important news around the world.

2.2 Social Media Challenges, Risks and Disadvantages

Social media has several advantages for businesses. However, it has some disadvantages such as risk factor and expected benefit. Knowing these disadvantages is very important for both businesses and consumers. Hacking is one of the most common potential risks of social media platforms. Hackers hack profiles and accounts and this

is defined as social engineering. Hackers print social security cards, driver's licenses, identity cards with information such as birth date, name, location of users, etc. The interesting part at this point is that although social media users know these risks, they do not hide their information. In other words, although social media users are aware of the danger, they do not adjust their privacy settings. Securing social media accounts against scammers and the unknown makes great contributions in the long run. Social media allows businesses to create a positive perception. In this context, businesses should warn their users against such virtual dangers. The officials of the enterprises should be reliable people who are competent in this regard and should not leak the information of their users. In the slightest loss of data, the reputation of businesses can be damaged, and their brands can be destroyed forever**.** Social media scams, which are the subject of even movies and TV series in social life, are most popularly fictionalized with fake accounts and used as a means of propaganda in illegal and harmful environments. These attempts, which try to generate income on the image of others with fake accounts, can be observed or controlled by ending these actions with the complaints of real people. Identity deformation, which begins with the capture of individuals' social media accounts by hackers, leads to serious material and moral losses as a result of accessing the private information, investment and bank accounts of the individual. In addition to that, many businesses actively use the advantages of social media, and some businesses tend to have a more measured approach to social media without breaking away from the traditional media they had previously adopted (Kütük 2016).

On the other hand, risk perception is a very powerful aspect of consumer behavior because risk is painful, and this can cause anxiety. When shopping online or on social media, customers encounter more than one risk. For example, customers may be concerned that the online ordering process is difficult or that there will be potential delays in the delivery of goods as a result of the order. Both types of anxiety are types of perceived anxiety with loss of time/convenience. Another risk perception is the possibility that the purchased product is not similar to the ordered product. The desire of consumers to protect their rights, which is a need that comes with such risks, is sometimes not possible. For example, it is difficult to complain about companies that do not have a physical presence or are headquartered in another country, and it distracts the consumer from online shopping (Kalburan et al. 2018). One of the important concepts that affect customer behavior in online purchases is "privacy". For this reason, transaction and customer data security issues are among the main risk perceptions. With the developing technology, the increase in opportunities such as collecting and analyzing the information of the customers visiting the online sales channels of the companies threatens the privacy rights of the consumers and this situation creates anxiety and discomfort for some customers (İnci 2014). From a general perspective, although trust is a basic requirement for any business relationship, trust is much more important in online or social media purchases than in traditional retailing. Because of the unique characteristics of the online shopping environment, customers have a greater sense of uncertainty and increased risk. Creating a sense of security by reducing uncertainty and risks is one of the most important issues for online sales channels (Güven 2013).

3   Managing Customer Relations on Online Products and Services

With the globalizing world, all sectors have entered into a change. In addition to the developments in the sectors, the customer structure has also started to change. The change in the customer structure has brought businesses into a new process of change and made it necessary to renew their strategies for their customers. At this point, the main strategy that businesses will implement for their customers is to make the customer the focal point of the business, to ensure customer satisfaction and to improve customer relations. Customer relationship management is defined as being able to establish a one-to-one relationship with each customer and respond to each customer (Kotler 2003: 34).

Customer Relationship Management, which has been widely used in recent years, is the creation of customer data by collecting all information about customers, classifying customers according to similar characteristics, so that they operate in line with these criteria in the product and service process. This strategy is the most important way of providing customer satisfaction and customer loyalty (Özilhan 2010). Customer relations is a process that aims to provide mutual benefit between the business and the customer, covering all pre-sales and post-sales activities (Yücel 2013). With the establishment of customer relations, customer loyalty is ensured together with customer satisfaction. The main purpose of customer relationship management is to provide customer-oriented service in line with customer information. In this process, to better understand the customer is to provide the right service to the customer (Askool and Nakata 2010). Customer relationship management is to offer the right product or service to the right customer at the right time, at the right price and at the right place. Customer relationship management has various purposes. These purposes are listed as follows in a report published in The Marketing Rewiew (Mail 2001):

1. Customer relationship management helps businesses gain loyal customers. Thanks to customer relationship management, businesses do not lose customers during periods of intense competition, and they gain more profit than their competitors.
2. With customer relationship management, businesses will be able to retain more profitable existing customers instead of finding new customers.
3. Businesses will be able to create a loyal customer base with customer relationship management. Customers who are loyal to the business do not terminate their relationship with the business when they encounter a product or service problem. Customer satisfaction can be achieved by the company's ability to compensate for this situation. This situation improves customer loyalty.
4. With customer relationship management, the business knows the expectation of the customer. At the same time, there is a mutual loyalty because it chooses a business that can meet the customer's expectations. At the same time, the customer is more comfortable with a business he knows. Therefore, it is possible to develop effective relationships with customers.

5. With the successful establishment of customer relationship management, it is easier for businesses with loyal customers to acquire new customers. Since loyal customers will contribute positively to the image of the business, the business will be able to gain new customers.

In line with the purposes of customer relationship management, it has become easier to identify customer needs and meet customer demands in line with their tastes. The fact that the enterprises know their customers well will ensure that products and services are offered to the customer, thus ensuring error-free production. A customer-oriented approach is adopted throughout the sales period. Thus, customer loyalty can be achieved, the efficiency of the business can be increased, a competitive advantage can be obtained and the business can reach a different and innovative position among its competitors. In this context, customer relationship management has many positive contributions to the business, especially customer loyalty.

Internet is the fastest and easiest communication tool used by the majority of people today. With the development of technology, various sites and social media applications are among the communication tools used by many people. The Internet has become a part of daily life, and this allows people to purchase a product or service as well as communicate and message (Melović et al. 2021). People can reach the opinions of users who buy a product or service before they buy it. On the other hand, individuals can share their experiences after purchasing a product. Positive and negative comments shared in online applications affect the purchasing behavior of individuals.

Online marketing activities are the promotion of a product or service online, and the sale of it through social networks and websites with the aim of increasing the popularity of the brand and business (Gunelius 2010; Demirci Orel and Arık 2020). Buying behavior of people in the virtual environment is quite different from the purchasing behavior in the physical environment. The reason for this situation is that positive and negative thoughts about a product or service in online applications can reach very large masses very quickly. Thus, the purchasing thoughts of customers can change very quickly. In this sense, online services of businesses are very effective in the purchasing behavior of customers (İşler et al. 2014). The volume of online shopping is increasing day by day. Businesses should determine the wishes and demands of customers very well and act in this direction. At this point, businesses should develop methods that can attract customers' attention and increase purchasing behavior. For example, social media applications can be used effectively to develop advertising and promotional tools that can attract the attention of customers. In addition to this situation, customers can be reached instantly via sms, e-mail and other communication applications and they are informed about the campaigns. Businesses can positively affect their purchasing behavior by transmitting discount news to customers with online applications (Rigger et al. 2022).

There are various dimensions in order to present the value-creating sides of the product or service they produce to the customers and to direct them to purchase. Studies by Yadav and Rahman (2017) and Kim and Ko (2010) were used to determine these dimensions (Demirci Orel and Arık 2020):

- Interaction: Since there is no limit to the concepts of time and space in online marketing, businesses can ensure that the product or service sales process continues (Şahin et al. 2017).
- Knowledgeability: In online marketing activities, businesses can effectively introduce the features of the product or service to the customer.
- Personalization: It is the personalization of the marketing process through online social networks for the interests of individuals. In this process, the display of advertisements by individuals through social media applications provides the opportunity for businesses to reach the target directly.
- Being trending: Businesses enable them to gain popularity by promoting their product or service through social media.
- Word of mouth communication: Businesses can share their positive and negative thoughts about the product or service through their websites and social media accounts. Since customer reviews are found to be more reliable by other consumers, positive comments from businesses will contribute to the increase in purchasing behavior (Godey et al. 2016).

The use of dimensions that are effective in the online sales process will positively affect this process. The online sales of products and services, which are developing day by day, affect the thoughts and behaviors of customers. The prevalence of online purchasing today means that businesses can reach a much wider audience in a very short time. However, if this process is not managed well, it can lead to negative situations for businesses. In order to prevent this situation, businesses need to provide customers with an effective purchasing process during the online product and service sales process. Businesses will be able to acquire new customers, increase the satisfaction and loyalty of existing customers and find various methods to stay in the online market if they can improve online shopping methods and online sales that can increase purchasing behavior.

Today, globalization and the rapid increase in competition have led businesses to new marketing methods in order to maintain their existence and develop their brands. With the increase in internet usage day by day, businesses have started to use online applications. With the active involvement of technology in every aspect of human life, businesses need to use technology in the most effective way to gain superiority over their competitors, to attract and protect customers and to strengthen relationships. Due to the lack of the concept of time and place, businesses that can reach the customer continuously have started to experience various innovations in customer relations with this new period (Özçiçek Dölekoğlu and Çelik 2019). Maintaining strong customer relations, customer satisfaction and loyalty are the main goals in online product or service marketing. Businesses can also create new customer groups with online marketing methods, which can reach the target audience more easily and quickly compared to the old marketing understandings. With online marketing activities, getting to know the customer, presenting marketing approaches for the customer's purchasing behavior, realizing the customer's demands and requests are a fast and effective tool that creates a positive effect in customer relations. Along

with customer relationship management, it ensures long-term relationship with the customer and increases customer satisfaction (Rita et al. 2019).

The dynamic nature of online product and service marketing requires the constant monitoring of changes in the competitive environment and the creation of customer-oriented strategies in line with these changes. On the other hand, businesses should increase the permanence of the customer by performing advertising and promotional activities through social media. Positive and negative opinions of the business are very important for the image of the business, as a previous purchasing behavior will also affect the subsequent purchasing behavior. The comment of a customer who has previously purchased the product or service of the business is very important as it will be an objective comment by other customers. In this context, positive comments on the product or service enable it to increase customer satisfaction and loyalty, as well as gain new customers (Kajtazi and Zeqiri 2020). In addition to this situation, customer comments expressing an opinion on a problem related to a product or service belonging to the enterprise can create a positive image by quickly eliminating the problem and ensuring customer satisfaction.

When the literature is examined, various studies have been found that examine the relationship between online product or service marketing and customer relationship management. Sökmen and Baş (2019) stated that online product and service marketing practices are an important opportunity in customer relationship management. They concluded that customer relationship management has a significant impact on customer satisfaction and loyalty. In another study, they concluded that online applications have a very important role in the management and development of customer relations, and businesses that are actively involved in online applications are more successful in developing customer relations (Çalışkan and Şahbaz 2019).

Customer relationship management is a management approach that determines the customer as the center point of production and marketing with online applications of the enterprise. The fact that businesses gain superiority over their competitors in competition, being in constant communication with their customers (notifying about campaigns, discounts and opportunities) in line with the developments in technology, and reaching many customers in the online environment quickly, easily, means that businesses can maintain their online customer relations (Kampani and Jahmb 2020).

The concept of customer relationship management has gained importance in online product or service marketing. In this context, it has become extremely important for businesses to manage customer relations with online tools. A good management of customer relations enables businesses to gain advantages over their competitors, increase their earnings ratio, reach wider customer bases and increase customer satisfaction and loyalty by strengthening relationships with existing customers.

4 Customer Intentions to Use Social Media Technology

Social media technologies undoubtedly affect every aspect of life. Social media, which is defined as user-generated content to share, discuss and collaborate by creating highly interactive platforms with mobile and web-based technologies (Kietzman et al. 2011: 242), is generally used to obtain information or to socialize, used for fun or learning. Social media gives users the opportunity to search, edit, share, annotate and contribute to content collaboratively (Şahbaz and Bayram 2013: 250). Social media is a system that works on the basis that users invite other users to contribute to the groups they have established and to join the network (Trusov et al. 2008: 10). Within this system, some applications or businesses have come to the fore and become a global power. According to a study conducted in 2022, it is stated that there are 4.62 billion social media users worldwide in January. In the same research, it was also stated that the most preferred social media tools were Facebook (2,910 billion users), Youtube (2,562 billion users), WhatsApp (2 billion users) and Instagram (1.478 billion users) (Digital 2022 Report). Although people in social media channels are called users, they are also called consumers in every environment where they are used the social media for consumption purposes. In this case, the fact that the consumer sees social media as a consumption tool is the result of a choice, because at this point the concept of intention comes into play. The intention of customers to use social media is the most important and frequently researched issue in literature, because this intention is also related to the purchase intention. Purchase intention, as an important decision that enables consumers to gain the title of customer by activating their purchasing instincts, constitutes an important step in purchasing behavior (Çağlar Çetinkaya 2020: 99). Intention to use social media technology is actually related to purchase intention of a customer. Customers' attempts to seek information, compare or experience a product or service on social media are seen as steps that can create their purchase intention. Social media tools are seen as tools that have the same qualifications as a salesperson or more than better a salesperson in this regard.

Customers use social media tools for different purposes in different areas. For example, a consumer who wants to go on vacation can use social media tools to obtain destination information. This information can be obtained from the sharing of different users, as well as from the social media accounts of businesses. As another example, a customer who wants to buy a computer can read the comments of other consumers as well as visit the social networks of the business. Although it is possible to perform these transactions on websites, the interaction offered by social networks makes the use of these networks more attractive. However, consumers may not have a positive view of being a customer in social networks, especially due to the perception of security. The perception of being a customer in social networks is associated with the consumer's acceptance of these networks. At this point, first of all, customers' trust and acceptance of these networks is required.

Before measuring customers' intention to use social networks, it is necessary to understand and explain their behavior. Many models come to the fore in the literature regarding this situation. Among these models, the Technology Acceptance Model

(TAR) is seen as the most prominent model. It can be said that the technology acceptance model developed to explain the adoption of technology (Yıldırır and Kaplan 2019: 26) is based on the Reasoned Behavior Theory (TRA) developed by Fishbein and Ajzen (1975) (Turan 2008: 726). According to TRA, behavioral intention is seen as the closest cause of behavior and behavioral intention is affected by one's attitudes and subjective norm (Trafimow 2009: 506). This model was later developed and formed the basis of the theory of planned behavior. Planned behavior theory is a theory that is created to explain and predict human behavior that takes place within a defined framework. Planned behavior is the main motivation for people to perform a behavior (Bayram 2018: 22). In this context, it can be seen as a useful model for understanding behavior in social networks. In addition to these models, the theory of diffusion of innovations has also mentioned. The theory of diffusion of innovation, on the other hand, is related to the adaptation process of people to innovation, gathering information and eliminating uncertainties (Rogers (1995). The technology acceptance model (TAM) specifically focuses on understanding the behavioral intention for actions related to technology (e.g., websites, social networking sites, smartphones, Wi-Fi networks, e-learning, e commerce, biometrics, etc.). According to TAM, the main determinants of users' attitudes toward technology are perceived usefulness and ease of use of technology (Acharya and Mekker 2022: 55). As mentioned above, TAM is seen as a derived model from the TRA model and replaces two of the attitude variables of the TRA with the technology acceptance factor (Zaineldeen et al. 2020: 5062). In other words, TAM is seen as a model that has renewed itself according to technological innovation while measuring the behavior of customers. The main purpose of the model is to investigate the effects of technology on user behavior and the model is lacking in determining the intentions of customers to use social media tools and contribute to the development of the use of social networks in the right direction.

Customers' social media usage intention is a subject that has been examined in different studies within the framework of different titles and topics. Studies show that the trust factor is an important issue in the formation of intention. For example, Isıp and Lacap (2021) examined the effect of social media use on the purchase intention of social media users. In the study, they concluded that the use of social media significantly affects the perceived risk, trust and purchase intention, and that the significant relationship between social media use and purchase intention is mediated by trust. Laksamana (2018) investigated the effect of social media marketing on purchase intention and brand loyalty and determined in the study that social media marketing leads to purchase intention and brand loyalty. Yılmaz (2018) found that perceived ease of use has a positive effect on both perceived usefulness and online shopping intention. In addition, in the study, it was concluded that the perceived product risk negatively affects the perceived usefulness and online shopping intention. Matin et al. (2020) investigated the effect of social media use among different customer segments on the level of trust in the advertising campaign and purchase intentions. In the study, it was concluded that participation in social media differs for different customer segments, but in all categories, participation in social media positively affects the level of trust and purchase intention among customers.

As a result, social media usage intentions of customers differ according to different variables. However, doing studies that will ensure the trust of customers in social networks can positively affect the intention. In addition, the occurrence of extraordinary situations (such as the COVID-19 pandemic) may also affect the intention to use social media. Good management of these processes will also make great contributions to businesses or practitioners.

5 Discussion and Conclusion

The need to support traditional applications of brands, products and services in their activities with social media technologies has given birth to the concept of social media-based customer relationship management with the introduction of social media into our daily lives recently. While today there are many products and management, very few potential consumers are in the market for this large number of products. In this context, it is seen that digitalization takes the first place and replaces traditional marketing methods. Now, people see the products of the companies, they follow on social media, read the comments of the customers who bought it before, and buy products by blending this information. In the developing and changing world, while social media attracts a certain audience for managements, it also threatens the existence of rival companies in the market. Social media is cheap, fun, easily accessible and interactively establishing a fast and direct connection between the consumer and managements. Comments or experiences shared on social media affects the purchasing ideas and attitudes of consumers, their pre-/post-purchase behavior, and after this evaluation, the consumer buys/gives up/does not repeat the product. Although it is emphasized that social media is cheap or less costly, it is not zero cost. In order to be more effective social media on customers' purchasing intentions, it is imperative that some experts in the field needs to be employed in this context. Social media technologies provide sustainable success and contribute significantly to the society, economy and future generations if they are carried out with an expert (Kahraman Aslan and Yavuz 2020).

With the increase in internet usage, changes have started to occur in customer purchasing habits, as is the case in every field. As a result of this situation, the excessive amount of time spent in social media applications has led businesses to online product and service marketing. It has been revealed that customers now examine the comments about the product on the websites or social media tools of businesses and brands without purchasing a product or service, and these comments affect their purchasing behavior (Yücel 2013). Its dynamic structure enables information to reach large masses very quickly.

In recent years, customers have been finding managements in an instant, low cost and interactive way and building relationships. Today, social media technologies are defined as our basic needs. Social media needs such as people's need for food, drink and shelter fill a large part of their lives. Comments, advertisements and content on social media are a determining factor in customers' product preference

and customer intentions. Considering that managements are consumer-oriented, the huge role of social media in sales should be taken seriously. Especially today, when online commerce has reached unavoidable dimensions, social media affects both preference, satisfaction and brand addiction and loyalty (Habibi et al. 2014). Studies show that business and product reviews on social media are found to be reliable by consumers. Promotion on social media, rather than traditional promotion, creates a greater impact and elevates managements to a more modern, unique and contemporary brand. Traditional marketing strategies are a method preferred by very few customers. Today's many consumers prefer to follow their favorite brand on social media, which is almost always at hand, and shows many people that they like that brand. This pretentious attitude creates the loyal customer base of the managements. In this context, managements should control all their promotion, marketing and promotion activities through social media with an expert and follow the feedback as much as possible. Social media, which is a result of developing communication technologies, may become out of date in the face of development. In this case, managements should always follow the agenda, trend concepts and popular events. People such as youtubers, Instagram able and influencer, who have emerged in recent years, are famous social media users that a large part of the world follows and takes as an example. The products and brands purchased by these people are preferred and both their reliability and quality are registered with the words of that person. For these reasons, it can be ensured that phenomenal people prefer the brand and managements and promote them on their own accounts (Kahraman Aslan and Yavuz 2020).

There are studies stating that e-satisfaction, e-trust and e-loyalty are effective on social media marketing activities (Humphrey et al. 2017; Asih and Pratomo 2018; Seo and Park 2018: 36–41). Kozinets (2002) found that consumers use various online formats such as blogs, podcasts, social networks and wikis to share ideas about a particular product, service or brand and to communicate with other consumers, whom they see as more objective sources of information. According to Mangold and Faulds (2009), social media technologies have a long and comprehensive process starting from the information process of customers to post-sales feedback. On the other hand, Scloser (2005) states that even a few negative feedbacks affect the customer's attitude toward the product or service (Atılgan 2020).

The literature review in the study reveals that there is a relationship between social media technologies and purchase intention. However, some issues need to be revised or changed for providing sustainable relations. For example, customers interest can be determined, and the accounts of managements can be arranged on this axis. Even interested managements can apply promotions and campaigns such as gifts, coupons, concert tickets, raffles, discounts to consumers from their social media accounts. Another issue is to customers want the trust that they expect from social media. Customers should forward any complaints or requests to the business via social media platforms and receive a quick response. The most important reason why customers prefer online commerce is that it is more economical. Therefore, businesses should always offer more suitable but quality products in online commerce. Finally, managements should adopt an approach that suits their customer profile,

interest and expectation in all products and services offered through social media. It can be recommended to businesses to prepare suitable content for these expectations such as entertainment, information exchange, communication and affordability, not to forget that they have different value perceptions and identity behaviors, and to introduce applications that will increase trust and satisfaction in online commerce.

References

Acharya S, Mekker M (2022) Public acceptance of connected vehicles: an extension of the technology acceptance model. Transp Res Part f: Psychol Behav 88:54–68

Adams DA, Nelson RR, Todd PA (1992) Perceived usefulness, ease of use, and usage of information technology: a replication. MIS Q 16(2):227–247

Asih RRD, ve Pratomo LA (2018) Peran mediası e-satisfaction dan e-trust terhadap e-loyalty. J Manaj Dan Pemasar Jasa 11(1):125–144

Askool SS, Nakata K (2010) Scoping study to identify factors influencing the acceptance of social CRM. In: 2010 IEEE International Conference on Management of Innovation & Technology, pp 1055–1060. IEEE (June)

Atıgan F (2020) Sosyal Medya Pazarlaması Ve Tüketici Satın Alma Değişkenleri İlişkisi, Sosyal Kimlik Ve Algılanan Değerin Aracılık Rolü Üzerine Bir Araştırma. BMIJ 8(2):1892–1921.

Aydede C (2006) Sanal Ortam Gümrükleriyle Blog Çağı. Hayat Yayınları, İstanbul

Bayram AT (2018) Planlanmış Davranış Teorisi Çerçevesinde E-spor Turizmine Katılma Niyeti. Turizm Akademik Dergisi 5(2):17–31

Bekaroğlu ŞB (2011) Doktor-Hasta İlişkilerinde Sosyal Medya Kullanımı. Akademik Araştırmalar Dergisi 13:145–165

Blossom J (2009) Content nation-surviving and thriving as social media changes on customer our work, our lives and our future. Wiley Publishing Inc, Indiana

Cavlak E (2012) Online Alışveriş Sitesi Tercihinde Etkili Olan Kriterlerin Belirlenmesine ve Önceliklendirilmesine Yönelik Bir Karar Modeli. Yayınlanmamış Yüksek Lisans Tezi. İstanbul Teknik Üniversitesi FBE, İstanbul

Chanthinok K, Ussahawanitichakit P, Jhundra-indra P (2015) Social media marketing strategy and marketing outcomes: a conceptual framework. In: Allied Academies International Conference. *Academy of Marketing Studies.* Proceedings, 19(2):35–52

Çağlar Çetinkaya N (2020) Tüketici İlgilenimi ve Satın Alma Niyeti Arasındaki İlişki Üzerinde Markaya Duyulan Güvenin Düzenleyici Etkisi. Uluslararası İşletme ve Ekonomi Çalışmaları Dergisi 2(2):98–109

Çalışkan G, Şahbaz RP (2019) A research on the determination of social customer relationship management approach: İzmir case. Int J Turk World Tour Stud 4(1):17–34

Demir FO, Kırdar Y (2007) Customer relations management: CRM. Rev Soc, Econ & Bus Stud 8:293–308

Demirci FO, Arık A (2020) The impact of social media marketing activities on online consumer engagement and purchase intention: fashion brands example. Erciyes Univ J Soc Sci Inst 49:146–161

Digital 2022 Report (2022) https://wearesocial.com/uk/blog/2022/01/digital-2022/

Dölekoğlu CÖ, Çelik O (2019) Internet shopping of generation Y. OPUS Int J Soc Res 11(18):1589–1601

Ertemel AV, Ammoura A (2016) The role of social media advertising in consumer buying behavior. Int J Commer Financ 2(1):81

Fishbein M, ve Azjen I (1975) Belief, attitude, intention and behavior. Addison – Wesley, Reading, MA

Florez GEL, Escobar CIM, Resrtrepo HA, Botero AA, Arias VA (2017) Influence of social networks on the purchase decisions of university students. Cuadernos De Gestión 18(1):61–84

Godey B, Manthiou A, Pederzoli D, Rokka J, Aiello G, Donvito R, Singh R (2016) Social media marketing efforts of luxury brands: influence on brand equity and consumer behavior. J Bus Res 69(12):5833–5841

Gunelius S (2010) 30-minute social media marketing: step-by-step techniques to spread the word about your business: social media marketing in 30 minutes a day. McGraw Hill Professional

Güven A (2013) Tüketicilerin Özel Alışveriş Sitelerinden Beklentileri ve Tüketicilerin Özel Alışveriş Siteleri Tercihini Etkileyen Faktörlerin Belirlenmesi: Ünye Örneği. Yayınlanmamış YüksekLisans Tezi. Karadeniz TeknikÜniversitesi SBE, Trabzon

Habibi MR, Laroche M, Richard MO (2014) The roles of brand community and community engagement in building brand trust on social media. Computers in Human Behavior 37:152–161

Hoffman DL, Fodor M (2010) Can you measure the ROI of your social media marketing? MIT Sloan Manag Rev 52(1):41

Humphrey WF Jr, Laverie DA, Rinaldo SB (2017) Brand choice via incidental social media exposure. J Res Interact Mark 11(2):110–130

Ioanas E, ve Stoica I (2014) Social media and its impact on consumers behavior. Int J Econ Pract Theor 4(2):295–303

Isip MSR, Lacap JP (2021) Social media use and purchase intention: the mediating roles of perceived risk and trust. J Mark Adv Pract 3(2):76–93

İnci B (2014) Bir Online Perakendecilik Yöntemi Olarak "Özel Alışveriş Sitesi" İş Modeline Yönelik Tüketici Algıları ve Satın Alma Davranışları. Yayınlanmamış Doktora Tezi. Marmara Üniversitesi SBE, İstanbul

İşler DB, Yarangümelioğlu D, Gümülü E (2014) A review on the factors affecting online buying behaviours of consumers: an application in Isparta District, Turkey. Int J Alanya Fac Bus 6(3)

Jackson GS (2015) The advantages of social network sites. Retrieved May 19, 2022 from http://smallbusiness.chron.com/advantages-social-network-sites-32069.html

Kahraman Arslan İ, Yavuz A (2020) Sosyal Medyanın Tüketici Satın Alma Davranışları Üzerindeki Etkisi. İstanbul Ticaret Üniversitesi Girişimcilik Dergisi (e-ISSN: 2717–7416), 4: 8, pp 151–170

Kajtazi K, Zeqiri J (2020) The effect of e-WOM and content marketing on customers' purchase intention. Int J Islam Mark Brand 5(2):114–131

Kalburan Ç, Aydın O, Haşıloğlu S (2018) İnternet'ten Alışveriş Faktörleri Modelinin Oluşturulması ve Bilişsel Haritalama Tabanlı Karar Verme. Tüketici Ve Tüketim Araştırmaları Dergisi 10(1):79–100

Kampani N, Jhamb D (2020) Analyzing the role of E-Crm in managing customer relations: a critical review of the literature. J Crit Rev 7(4):221–226

Kaplan AM, Haenlein M (2010) Users of the world, unite! The challenges and opportunities of social media. Bus Horiz 53(1):59–68

Keeney RL (1999) The value of internet commerce to the customer. Manag Sci 45(4)(April 1999)

Kietzman JH, Krıstopher H, Mccarty IP, Sılvestre BS (2011) Social media? Get serious? Understanding the functional building blocks of social media. Bus Horiz 54:241–251

Kim AJ, Ko E (2010) Impacts of luxury fashion brand's social media marketing on customer relationship and purchase intention. J Glob Fash Market 1(3):164–171

Klieber P (2009) Document classification through data mining social media networks. Stetson University, Florida

Kotler P (2003) Marketing insights from A to Z: 80 concepts every manager needs to know. John Wiley & Sons

Kozinets RV (2002) The field behind the screen: using netnography for marketing research in online communities. Journal of Marketing Research 39(1):61–72. ISO 690.

Kumar A, Bezawada R, Rishika R, Janakiraman R, Karman PK (2016) From social to sale: The effects of firm-generated content in social media on customer behavior. J Mark 80(1):7–25

Kütük A (2016) Social media marketing in tourism industry and role of the social media on consumer preferences: a survey on the effects of social media sites on the buying decision making process. Master Thesis.

Laksamana P (2018) Impact of social media marketing on purchase intention and brand loyalty: evidence from Indonesia's banking industry. Int Rev Manag Mark 8(1):13–18

Liu C, Arnett K (2000) Exploring the factors associated with web site success in the context of electronic commerce. Inf & Manag 38:23–33

Mail R (2001) Customer managed relationships. Mark Rev 2(4):461–473

Mangold WG, Faulds DJ (2009) Social media: the new hybrid element of the promotion mix. Bus Horiz 52(4):357–365

Matin A, Khoshtaria T, Tutberidze G (2020) The impact of social media engagement on consumers' trust and purchase intention. Int J Technol Mark 14(3):305–323

Melović B, Šehović D, Karadžić V, Dabić M, Ćirović D (2021) Determinants of millennials' behavior in online shopping-implications on consumers' satisfaction and e-business development. Technol Soc 65:101561

Miller D, Sinanan J, Wang X, McDonald T, Haynes N, Costa E, Nicolescu R (2016) How the world changed social media. UCL Press, p 286

Özilhan D (2010) The effects of customer relationship management (Crm) practises on enterprise performance. Gümüşhane Univ Soc Sci Inst Electron J 1(1)

Parveen F, Jaafar NI, Ainin S (2015). Social media usage and organizational performance: reflections of Malaysian social media managers. Telematics and Informatics, 32(1):67–78

Pate SS, Adams M (2013) The influence of social networking sites on buying behaviors of millennials. Atlantic Marketing Journal, 2(1):7

Riegger AS, Merfeld K, Klein JF, Henkel S (2022) Technology-enabled personalization: impact of smart technology choice on consumer shopping behavior. Technol Forecast Soc Chang 181:121752

Rita P, Oliveira T, Farisa A (2019) The impact of e-service quality and customer satisfaction on customer behavior in online shopping. Heliyon 5(10):e02690

Rogers E (1995) Diffusion of innivations, 2nd edn. Adivision of Macmillan Publishing Co. Inc, New York

Schlosser AE (2005) Posting versus lurking: communicating in a multiple audience context. J Consum Res 32(2):260

Seo EJ, ve Park JW (2018) A study on the effects of social media marketing activities on brand equity and customer response in the airline industry. J Air Transp Manag 66:36–41

Sökmen A, Baş M (2019) The influence of electronic customer relationship management practices on relationship quality and customer loyalty: a research in airline industry. J Bus Res 11(1):641–652

Şahbaz RP, ve Bayram AT (2013) Otel İşletmeleri Facebook Sayfalarının Pazarlama İletişimi Açıcından Değerlendirilmesi: Antalya Örneği. Ulusal Turizm Kongresi Bildiri Kitabı, pp 249–265

Şahin E, Çağlıyan V, Başer HH (2017) The effect of social media marketing on customer purchasing behavior: the example of Selcuk Unıversıty Faculty of Economıcs and Admınıstratıve Scıences. J Ömer Halisdemir Univ Fac Econ Adm Sci 10(4):67–86

Şimşek M (2019) An assessment on the purposes and practices of social media customer relationship management. Unpublished Master Thesis, Maltepe University

Trafimow D (2009) The theory of reasoned action a case study of falsification in psychology. Theory Psychol 19(4):501–518

Trainor KJ (2012) Relating social media technologies to performance: a capabilities based perspective. J Pers Sell & Sales Manag 32(3):317–331

Trusov M, Bucklin RE, Pauwels KH (2008) Effects of word-of mouth versus traditional marketing: findings from an internet social networking site. Social Science Research Network Electronic Paper Collection. http://ssrn.com/abstract=1129351

Turan AH (2008) Internet Alışverişi Tüketici Davranışını Belirleyen Etmenler Geliştirilmiş Teknoloji Kabul Modeli E TAM ile bir Model Önerisi. Presented at the Akademik Bilişim 2008

Tutar K, Ünalir MO, Toker L (2015) Sosyal Ağlar Üzerinde Ontoloji Tabanlı Sezgi Analizi İçin Bir Uygulama Çerçevesinin Geliştirilmesi. Pamukkale Üniversitesi Mühendislik Bilim Dergisi 21(5):194–202

Uyar A (2019) Sosyal Medyanın Tüketicilerin Satın Alma Niyeti Üzerine Etkisi: Üniversite Öğrencileri Üzerine Bir Çalışma. J Yasar University 14(Special Issue):137–147

Yadav MS, De Valck K, Hennig-Thurau T, Hoffman DL, Spann M (2013) Social commerce: a contingency framework for assessing marketing potential. J Interact Mark 27(4):311–323

Yadav M, Rahman Z (2017) Measuring consumer perception of social media marketing activities in ecommerce industry: scale development & validation. Telematics and Informatics, 34(7):1294–1307

Yaman Y (2018) Müşterilerin Mobil Alışveriş Kanalını Kullanma Niyetini Etkileyen Faktörler. Beta Dergi 10(1):1–27. http://www.betadergi.com/ttad/yonetim/icerik/makaleler/165-published.pdf, 06.05.2022

Yıldırır SC, Kaplan B (2019) Mobil Uygulama Kullanımının Benimsenmesi: Teknoloji Kabul Modeli İle Bir Çalışma. Kafkas Üniversitesi İktisadi Ve İdari Bilimler Fakültesi Dergisi 10(19):22–51

Yılmaz Ö (2018) Tüketicilerin Online Alışveriş Niyetlerinin Teknoloji Kabul Modeli Bağlamında İncelenmesi. Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi 20(3):331–346

Yücel N (2013) The customer relationship management in the a new understanding: social customer relationship management. J Acad Soc Sci Stud 6(1):1641–1656

Zaineldeen S, Hongbo L, Koffi AL, Hassan BMA (2020) Technology acceptance model' concepts, contribution, limitation, and adoption in education. Univers J Educ Res 8(11):5061–5071

Dr. Melike Sak is a senior lecturer at the Selçuk University, Department of Travel Management, Konya, Turkey. Sak published many papers and book chapters in different journals. Sak is a reviewer in several journals.

Dr. Yavuz Çetin is a senior lecturer at the Adnan Menderes University, Department of Tourism Management, Aydın, Turkey. Çetin published many papers and book chapters in different journals. Çetin is a reviewer in several journals.

Dr. Ali Turan Bayram is a senior lecturer at the Sinop University, Department of Tour Guiding, Sinop, Turkey. Bayram published many papers and book chapters in different journals. Bayram is a reviewer in several journals.

Dr. Gül Erkol Bayram is an associate professor at Sinop University, Department of Tour Guiding, Sinop, Turkey. She has published many papers and book chapters in different journals. She is a reviewer in several journals. She is also a keynote speaker at different conferences. She can be reached at gulerkol@windowslive.com.

Barriers to Using Mobile Payment Technology

Alaa Mahdi Sahi, Haliyana Khalid, and Alhamzah F. Abbas

1 Introduction

Electronic commerce (e-commerce) transformed the business world in 1990. Since then, e-commerce has expanded and grown, benefiting customers and businesses worldwide. With so many companies doing business this way, it is obvious that the e-commerce industry has a bright future ahead of it and the companies will benefit the most (Abrazhevich 2004, p. 1). Thanks to Internet business transactions, e-commerce has gained popularity. It enables the buying and selling of items over the Internet, as well as the provision of a wide range of services and information, and the rapid exchange of funds between business partners. Electronic payments refer to business payments that take the form of online monetary exchanges via e-commerce. The system of electronic payments is the backbone of e-commerce and one of its most important components.

A. M. Sahi (✉) · H. Khalid
Azman Hashim International Business School, Universiti Technologi Malaysia, 54100 Kuala Lumpur, Malaysia
e-mail: sahi.alaa@graduate.utm.my

H. Khalid
e-mail: haliyana@utm.my

A. M. Sahi
College of Administration and Economics, Wasit University, 52001 Al-Kut, Iraq

H. Khalid
College of Business Administration, University of Business and Technology, 23435 Jeddah, Saudi Arabia

A. F. Abbas
Azman Hashim International Business School, Universiti Technologi Malaysia, 81310 Johor Bahru, Malaysia
e-mail: alhamzahfadhil@graduate.utm.my

The importance of digital payments in e-commerce is an information and communication technology-based payment service such as integrated circuit cards (IC), cryptography, and telecommunications networks (Raja et al. 2008). A well-functioning electronic payment system reduces the cost of trade and is considered critical to the smooth functioning of capital and interbank markets. Electronic payment systems have evolved as technology has advanced and include credit cards, debit cards, electronic cash and check systems, smart cards, digital wallets, contactless payment methods, and mobile payments.

According to Dahlberg et al. (2003), mobile payments can replace all major payment methods, including "cash, credit and debit cards, and electronic bill payments." Because mobile devices have so many capabilities, continued research and innovation are helping consumers embrace mobility. According to Oliveira et al. (2016), mobile devices can be used for a variety of transactions, including account transfers, travel tickets, peer-to-peer transfers, proximity and remote payments, rebates, bill payments, and mobile marketing. This flexibility makes it easier for consumers to manage their payments.

Although many customers are aware of the benefits of mobile payments such as simplicity, convenience, and effectiveness, Yang et al. (2015) claim that their adoption of mobile payments is influenced by their fears of potential risks. Given how the Internet and digitization have shaped consumer behavior and views, and the significant benefits that can be realized, it is interesting that there seems to be so much resistance to mobile payments. Many customers still have questions about the reliability and safety of mobile payments because mobile payments transmit certain private information such as credit card data and account balances. However, there might be more reasons for the resistance.

Moreover, since the majority of customers value mobility and everyday Internet access, it is essential to develop technologies that beneficially help them. According to Smolarczyk (2018), mobile payments allow consumers to transfer money faster, which can increase their satisfaction (Ates 2019). So, this chapter going to focus on barriers to using mobile payment technology, by exploring the concept of mobile payment technology, mobile payment technology acceptance, and mobile payment determinants. And at the end of the chapter, their will mentioned the discussion and conclusion.

2 Concept of Mobile Payment Technology

Payment for goods, services, and bills via a mobile device typically require the use of wireless and other communication technologies. This is what is meant by the term "mobile payment." Also can be defined as "Payments for goods, services, and bills with a mobile device (such as a mobile phone, smartphone or personal digital assistant (PDA) by taking advantage of wireless and other communication technologies" (Dahlberg et al. 2008, p. 165).

Karnouskos and Fokus (2004) add to this definition by explaining that mobile devices need to verify and approve that money is exchanged for goods and services during a payment transaction. Thus, the difference between mobile payments and traditional payment methods is that in transfer technique value, the characteristics of the mobile devices are important and the consumer's financial data is tokenized (Pandy and Crowe 2014). It is a process that involves three parties: customers, merchants, and banks (Ghezzi et al. 2010).

Mobile payments distinguish between remote and proximity mobile payments, as shown in Fig. 1 (Kerviler et al. 2016; Slade et al. 2013). Mobile Internet payments for digital content or online transactions are examples of remote mobile payments. But, nearby mobile payments and proximity mobile payments let you pay for things like tickets and items at the point of sale. As the name suggests, physical proximity is the most important part of this technology, i.e., the short distance between payer and payee (Ceipidor et al. 2012). NFC (Near Field Communication), Bluetooth, or displaying the code QR on the smartphone are all options for payment (Slade et al. 2013). To purchase with proximity payments, the customer must be in the store (Kaymaz 2011).

Traditional in-shop payment methods, for example, cash, debit, and credit cards can be substituted with proximity mobile payments (Dahlberg et al. 2008). Because proximity mobile payments are less popular and less accepted than remote mobile payments (Kerviler et al. 2016).

According to Hayashi (2012), consumers benefit from mobile payment systems in proximity. The main advantage of mobility is that you do not need to carry around a multitude of plastic cards. Another advantage of mobile payments in close proximity is their speed because depending on the size of the transaction, users only need to show or wave their smartphones to complete the transaction. Since smartphones can
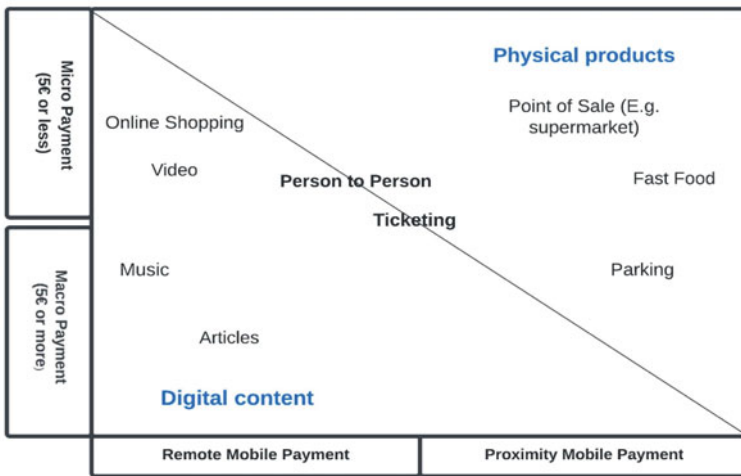

Fig. 1 Classification of mobile payment (Dotzauer and Haiss 2017)

link some business actions to payments, can save money by using proximity mobile payments. Financial management and control should also be simplified. However, one of the most important benefits is the very high level of security that is associated with mobile payment transactions, because the data transfer is one-of-a-kind and does not depend on a fixed PIN due to the dynamic authentication provided by the chip built into the phones.

Financial services delivered through digital mobility technology come in a variety of forms, purposes, and functions. You can obtain some banking functions known as mobile banking through an agent-technology combination, and destinations. They are also able to represent the functions of transaction payments, commonly known as mobile payments. They could mimic the concept of digital currencies, which would then be called mobile money. On the other hand, these concepts are not black and white and their boundaries are not fixed. There are several misconceptions regarding these terms, which are often used in a way that is not consistent with their original meaning. The term "mobile payments," which can refer to invoice payments, acquisition payments, or a transfer of funds from financial agent to financial agent, is also used in the banking sector. Other terms such as "mobile money," "mobile money transfer," and/or "mobile banking" may be more accurate in certain circumstances. M-banking, m-payments, m-transfers, m-payments, and m-finance together refer to a range of applications that allow people to use their cell phones to manipulate their bank accounts, store value in an account linked to the cell phone, transfer money, or even access credit or insurance products.

Because of using these terms extensively, a conceptual basis was needed to support the literature review. To this end, they used a technique developed by Cernev (2010) according to a past study (Jenkins 2008; Laukkanen et al. 2008). Cernev (2010) mentioned four basic terms that need to be defined to capture the many expressions related to financial transactions via mobile devices: mobile transactions, mobile payments, mobile banking, and mobile money. Table 1 lists the proposed definitions for these terms, and Fig. 2 shows their semantic linkage.

In this way, mobile banking, mobile money, and mobile payments are grouped under the term mobile transactions according to Cernev (2010), suggesting that each of these terms is a single transactional application performed using a mobile device (see Fig. 1). Since these are mobile device payment services some mobile banking and payments overlap. This is the case, for example, when you pay a bill using a mobile device's bank account. Mobile money can also be used for mobile payments, which are made with cash in a digital wallet or without a bank system.

Mobile payment is the term practitioners and researchers use to study the phenomenon based on these definitions. As shown in Fig. 2, mobile payment includes payment transactions associated with other definitions like mobile money or mobile transaction.

Table 1 Definitions of mobile payment concepts

Concept	Definition
Mobile transactions	This refers to transactions made through mobile devices and other technological gadgets. It includes all types of mobile transactions enabled by technology, whether financial or not, as well as making mobile payments
Mobile payments	Mobile payments are transactions made or enabled by digital mobility technologies, such as portable devices and mobile telecommunications networks, regardless of whether mobile telecommunications networks are used or not. Even though these payments are digital financial transactions, they are not always associated with financial institutions or banks. There are various mobile payment systems in use around the world today
Mobile banking	Mobile banking is a collection of mobile banking services that use telecommunication networks are connected to mobile devices. They allow customers to make mobile payments, conduct transactions, and access other banking and financial services associated with their accounts, whether or not traditional banking institutions are involved. This term can also refer to the banking channel, which is the way financial organizations offer digital mobile services to their customers by integrating the principles of service and channel
Mobile money	Because it is primarily digital, e-money has the characteristics of mobility and portability; it is comparable to mobile money or mobile cash. It differs from other forms of electronic payments (such as credit cards, debit cards, smart cards, etc.) in that it can mimic the basic characteristics of traditional money, such as liquidity, acceptability, and anonymity A 'mobile wallet,' i.e., a digital shop for electronic money implemented through mobile devices that enables peer-to-peer (P2P) transactions between mobile devices (M2M) of users of the same service, can be used to operate mobile money. It works similarly to a traditional physical wallet and stores money as well as credit and debit cards

3 Barriers to Using Mobile Payment Technology

The literature is replete with studies on innovation, ranging from firms' perceptions of how to innovate to customers' acceptance of innovation. Innovation literature emphasizes all innovations are beneficial, promising advancements to consumers, and better current offers, implying a tendency to change (Dotzauer and Haiss 2017; Kleijnen et al. 2009; Laukkanen et al. 2008). In reality, companies have to deal with a variety of innovation failures, Coca-Cola is one of the most famous examples among many others. In 1985, the company introduced "New Coke" to replace the previous "Classic Coke." Many consumers objected to Coca-Cola's decision, and protest groups formed, eventually leading to the reintroduction of "Classic Coke."

Hew et al. (2017) describe innovation resistance as an individual's behavioral resistance to anticipated changes in their existing beliefs or status quo as a result of the introduction of a particular innovation. Innovation Resistance Theory (IRT) describes the resistant behavior of users when faced with the challenge of a modern technological introduction. In a previous study, innovation resistance was divided into
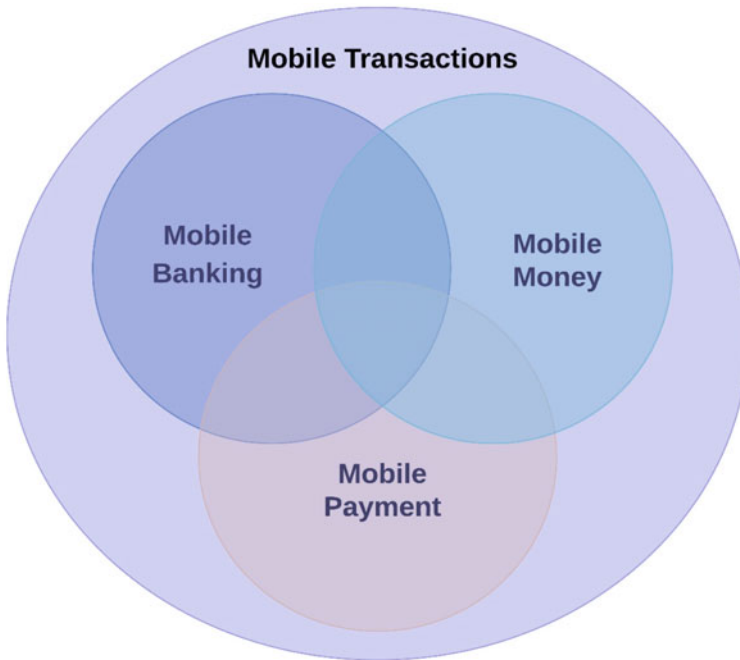
Fig. 2 The most regularly used phrases in the area of mobile financial transactions and their relationships—Cernev (2010)

two types: (1) active resistance, which assesses the flaws linked with the innovation's features, and (2) passive resistance, which doubts the innovation's subsequent benefits (Heidenreich and Handrich 2015). As a result, consumer reluctance to adopt new technologies is a crucial component of the success of innovations commercialization, and implementation (O'connor and Rice 2001). To distinguish successful innovations from failed implementations, it is critical to identify common characteristics to overcome current market resistance (Cheng et al. 2019). To ensure profitability and market competitiveness, industry practitioners should make product/service changes that reflect the underlying causes of market resistance (Cham et al. 2021; Roy et al. 2018).

The IRT paradigm has attracted much attention in academia because it can explain why consumers reject innovative initiatives such as mobile banking, both consciously and unconsciously (Laukkanen 2016), mobile payments (Leong et al. 2020), and social commerce (Hew et al. 2019; Lew et al. 2020). This concept is also evident in the current situation, where the steady development of mobile payment use is being held back by widespread social resistance and rejection (Kaur et al. 2020; Leong et al. 2020). The inability of consumers to recognize the benefits and value of various technological advances is a contributing factor. Several research papers have highlighted

the far-reaching consequences of the existing barriers such as functional, psychological, and risk-related barriers as common resistance-inducing limitations. Previous academic attempts to explain customers' intention to adopt mobile payments encompassed a variety of theoretical views, including the theory of planned behavior, the theory of innovation diffusion, the technology acceptance model, and the theory of technology acceptance and use. This chapter takes a sideways look at the topic and examines behavioral resistance using the IRT conceptual framework. The idea of inventive resistance to mobile payment was explored in this chapter by identifying both antecedents (barriers) and consequences (attitude and non-acceptance intention) (Cham et al. 2021).

Ram and Sheth (1989) were among the first to focus their studies on the challenges of introducing products that lead to consumer resistance. They provided a conceptual foundation for researching resistance to innovation. This conceptual framework has been regularly refined and tested in different circumstances and is the most commonly used model in the study of innovation resistance (Laukkanen and Kiviniemi 2010). Although the model is relatively old, in today's research, it's still relevant and particularly well suited for this study because it used in several studies that also addressed technological breakthroughs such as mobile banking and online shopping. Moreover, one study in the field of mobile payments has concentrated on barriers to adoption, further underscoring the suitability of the model (Dotzauer and Haiss 2017; Pinchot et al. 2016).

Ram and Sheth (1989) identified five barriers to adoption, which they divided into two categories: functional barriers, which are directly related to innovation, and psychological barriers, which are due to consumers' disagreement with their previous beliefs. Functional barriers include things like usage habits, the value of the product or service, and the risks associated with the use of the product or service (Dotzauer and Haiss 2017). Consumer habits and the perceived image of innovation are the most important psychological barriers, according to the authors. Figure 3 shows the original model in detail.

Fig. 3 Innovation resistance model by Ram and Sheth (1989)
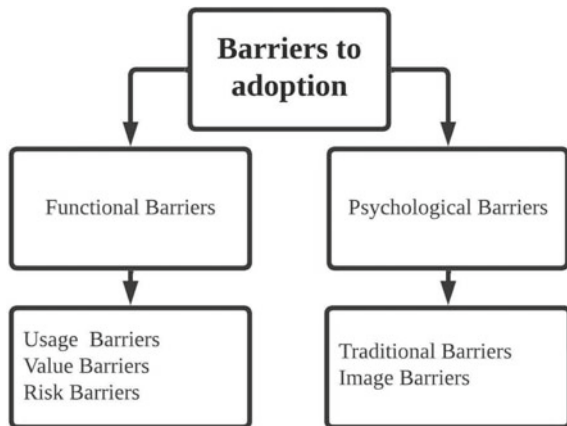
3.1 Functional Barriers

Porter and Donthu (2006) define functional barriers include the utility, value, and likely customer valuation of a modern invention. According to Ram and Sheth (1989), consumer barriers to use arise when customers encounter conflicting prospects between subsequent advances and existing features and applications. Rogers (2003), on the other hand, examined the importance of relative value in weighing the benefits of technological progress, breakthrough in terms of willingness to adopt it (Gupta and Arora 2020). To date, functional barriers have been explored from the independent perspectives of the use barrier, the value barrier, and the risk barrier (Antioco and Kleijnen 2010; Cham et al. 2021; Mani and Chouk 2018).

3.2 Usage Barrier

Consumers must change to use a new product or service because new skills must be learned and existing habits must be changed (Ram and Sheth 1989). Consumers may resist innovation if they are satisfied with their present circumstances and see no reason to change them, especially in the early stages (Kleijnen et al. 2009). The barrier to Use (UB) refers to the functional usability of an innovation, which is mainly composed of two aspects: The first consideration is whether the new product or service is simple to use or complex. The second relates to the extent to which consumers have made changes to use the innovation, which often goes against their habits (Dotzauer and Haiss 2017; Laukkanen 2016).

3.3 Value Barrier

The following barrier examines the value of innovation to the consumer, especially (Ram and Sheth 1989) on the value of money of the invention and the need for the innovation to have compelling "value for money" (Ram and Sheth 1989, p. 8). If the new product or service requires users to do more work, it is likely to meet resistance. In terms of mobile payments, consumers' value means the effort required to use mobile payment services more than the benefits they offer compared to traditional payment methods. Also, more authors mentioned that the overall benefit or added value of using an electronic device is the value barrier (VB) (Dotzauer and Haiss 2017; Laukkanen et al. 2008).

3.4 Risk Barrier

For consumers, innovations involve certain risks, as new products or services are associated with a large number of unknowns (Ram and Sheth 1989). Consumers who are aware of the risks are more inclined to reject new technologies. According to Ram and Sheth (1989), there are four different types of risk barriers. The first is physical risk, which describes how innovation can cause injury to people or property. Privacy, confidentiality, and personal information concerns can arise from technological advances (Chemingui and Ben 2013). Second, economic risk is associated with the cost of a new product or service that is becoming more popular as costs rise (Ram and Sheth 1989). The third category of risk is a functional risk, which is about how innovations work and the fear that they will fail because of their novelty. Consumers are particularly concerned about problems with Internet connectivity in mobile and Internet banking (Chemingui and Ben 2013), which may be important in mobile payments. Another part of the functional barrier associated with the risk of being hacked when making a payment is a concern with mobile payments, also the concern that the smartphone battery life will run out at a point of sale (Hayashi 2012). Also, social risks refer to the concern of being judged by others as a result of the adoption of a new product or service in the context of technology, this last type of risk has proven to be less essential (Dotzauer and Haiss 2017; Kleijnen et al. 2009).

In the invention process, the risk is almost always unavoidable (Humbani and Wiese 2019). The section is widely considered a significant barrier to the widespread use of contemporary adoption and innovative acceptance frameworks (Sivathanu 2019). In response, Joachim et al. (2018) highlighted the importance of an inverse relationship between innovation adoption and the level of uncertainty. When adopting an unfamiliar structure or system, industry actors constantly face organizational and environmental risks (Stjepic et al. 2021). The basics of simplicity and usefulness in mobile transaction services, according to Wiradinata (2018), contribute to increased organizational performance without consideration of innovation-related risks. In reality, the element of risk created by greater levels of uncertainty would lead to consumer rejection (Sivathanu 2019). Zhang and Zhang (2011) presented a risk paradigm from an individual perspective and categorized risks into financial considerations, social components, psychological concerns, performance, safety, and opportunity/time. Ryu (2018a) then presented different perspectives on the initial acceptance of financial technology from the perspectives of money, privacy, security, performance, psychological, and social.

3.5 Privacy Risk

Featherman et al. (2010) define privacy risk as to the possibility that consumers' private information will be exposed by the application of a technology product or service. This concept has been considered the most significant barrier to the adoption of products and services relating to technology (Herault and Belvaux 2014). Privacy and data protection issues have hindered the adoption of contact tracking technology (Hew et al. 2017; Liu et al. 2021). Perceptions of customers of security in certain mobile transactions are influenced by privacy and online visibility concerns, in addition to the relevance of brand position and ease of use (Khanra et al. 2021). These concerns stem from the mobile payment service's privacy disclosure obligation. In contrast, the importance of the risk element is outweighed by the service-related trust in using a financial service (Sahi et al. 2022). However, this does not preclude the possibility of an intentional breach through carelessness and negligence, confidential information was disclosed (Cocosila and Trabelsi 2016; Sahi et al. 2021). Privacy concerns remain a viable predictor of customer aversion to mobile payments (Liu et al. 2021; Thakur and Srivastava 2014).

3.6 Security Risk

Any potential loss due to hacking or fraud that compromises the security of a transaction technology is defined as a security risk (Thakur and Srivastava 2014). The component considered in this context is the security of the network, device, and mobile payment application (De Luna et al. 2019). In turn, virtual intruders and experienced fraudsters can cause financial losses and violate users' privacy (Ryu 2018b). The security aspect has been found to affect consumer trust and intention to use mobile payments, while system functionalities increase market acceptance (Ryu 2018a). While organizations conducting mobile transactions are held highly accountable for user risk assessment, experienced losses and uncertainty avoidance determine culpability for unauthorized security and privacy breaches (i.e., ability to resolve security issues) (De Luna et al. 2019). Thakur and Srivastava (2014) reached similar conclusions about the combined influence of risk appetite, security, and trust on market intention to use mobile payments. The component is also recognized as the main concern of people who conduct online transactions (Ryu 2018b). As a result, financial, time, and social insecurity could all be antecedents to using mobile payments (Thakur and Srivastava 2014). Therefore, the influence of security risk on reluctance to use mobile payment services is recognized (Cham et al. 2021; De Luna et al. 2019).

3.7 Financial Risk

The risk of financial loss in a transaction involving technological innovation is called financial risk (Featherman and Pavlou 2003). Financial fraud, moral hazard, additional transaction costs, and payment system collapse are common occurrences (Ryu 2018a; Sahi et al. 2022). Therefore, disclosing users' financial data by using wireless communication technology is a possibility (Kaur et al. 2020). Consumer security expectations of universality and traceability, on the other hand, emerged as barriers that make mobile payment systems dangerous for the transaction of money (Johnson et al. 2018). Malware intrusion into account and financial data during transactions via two-dimensional codes (2D code) and near field communication (NFC) have also been discussed. In addition to trust, perceptions of security, privacy, and financial risk have been shown to have a significant impact on the adoption of mobile payment services (Kaur et al. 2020). Before mobile uptake, trust and risk perception were contrasted. As a result, one of the most common reasons why individuals do not use mobile payments is that they don't want to take a financial risk (Yang et al. 2015).

3.8 Operational Risk

Operational risk is defined as any loss of cash or information leakage that consumers of mobile payment services may be exposed to (Barakat and Hussainey 2013). The component contains the following from a financial perspective: Various errors caused by a company's technical systems, personnel, and general financial operations, as well as external variables such as product complexity, regulatory structure, social system, and legal judgment (Ryu 2018b; Yang et al. 2015). The use of mobile payments would be slowed down by problems in internal processes, system failures, inadequacies, and a lack of quick response and operational skills (Humbani and Wiese 2019). Operational risk is often considered a major impediment to the performance of financial institutions and has the potential for significant operational losses (Yang et al. 2015). Operational constraints are seen as a barrier to the successful use of mobile transactions because of lower digital penetration within a community (Pal et al. 2020). The impact of operational barriers on consumers' continued use of mobile financial technologies has been overshadowed by the importance of financial constraints (Cham et al. 2021; Putritama 2019), operational factors are still important factors in users' decision-making process.

3.9 Psychological Barriers

Psychological barriers are the outcome of a clash between the cultural and perceptual biases of the user and innovation (Porter and Donthu 2006). As the only components

of psychological barriers, Antioco and Kleijnen (2010) concentrated on the factors of the traditional barrier and image barrier. Because technology adoption directly reflects anticipated lifestyle change, disruptive innovations often face market resistance in the form of negative reactions, rejection, and attempted subversion (Shao et al. 2020). This is true when pre-existing perceptions about a particular innovation are at stake and few product-related facts are available to make an appropriate assessment (Hew et al. 2017). As a result, psychological and cultural factors are important predictors of consumers' preference for virtual technologies over their physical counterparts (Bellis and Johar 2020; Cham et al. 2021). The latest studies extend the previously identified predispositions to examine the particular role of trust, inertia, and technology anxiety in innovation adoption.

3.10   Tradition Barrier

The tradition barrier (TB) is defined by Ram and Sheth (1989) as the disruption of routines that have been in place for a long time and are highly respected as a factor in psychological resistance to innovation. This is especially true for eating habits. However, it is crucial in the context of technological advances, such as the use of self-service technologies in the absence of traditional staff or the general fear that technology will replace human labor (Chemingui and Ben 2013; Dotzauer and Haiss 2017). The more traditions are broken, the greater the consumer resistance.

3.11   Image Barrier

If there is a link between innovation and bad elements of the manufacturer's brand, country of origin, or industry, customers will construct a negative image of it, which leads to resistance (Ram and Sheth 1989). The image barrier (IB) is uniquely shaped by prejudice or stereotype and is, therefore, seen as special. About technological breakthroughs, this element also includes a consumer's general willingness to use technology and his or her impression of the unreliability of technology (Laukkanen 2016). An example of mobile payments is the perception of many consumers that it is not a secure payment option (Hayashi 2012). However, because authentication is very dynamic, e.g., using NFC crisps or facial recognition, mobile payment can greatly limit misuse. Compared to typical payment systems that use a static PIN or the same signature every time, this provides better security that is often overlooked by consumers (Dotzauer and Haiss 2017).

4 Mobile Payment Technology Acceptance

4.1 Prominent Technology-Related Models

Numerous theoretical models of mobile payment technology adoption have been developed, based on theories from psychology and sociology, to explain technology adoption and usage (Momani et al. 2017; Rahman et al. 2021; Samaradiwakara and Gunawardena 2014; Venkatesh et al. 2000). After a thorough literature review, there are a variety of theories and models that are often invoked to better understand why people choose to use or not use technology. Table 2 shows the main supporting theories and models for customers' use of technology.

4.2 User Perception and Experience with Mobile Payments

A particular mobile payment system will prevail depends on customer acceptance. Therefore, the predominance of technology-based payment solutions depends on whether they meet their perceived or actual needs (Amoroso and Magnier-watanabe 2012, p. 95). Customers' payment methods have evolved from traditional credit cards to mobile devices due to technological innovation (Kerviler et al. 2016). Mobile payment service (MPS) was introduced to improve the simplicity and utility of the payment method (Ting et al. 2016).

4.3 The Technology Acceptance Model

The technological acceptance model is one of the approaches that previous researchers have commonly familiar with the aspects that influence the adoption of innovation. Davis' (1989) model introduces two crucial variables: perceived usefulness and perceived ease of use. In the rest of his research, he determines the importance of the two variables. First, Davis (1989) defines perceived usefulness as "the extent to which a person believes that using a particular system will improve his or her job performance." Consequently, consumers should believe that the use of technology and innovation would make their lives easier. Second, it is important to develop applications or tools that are easy to use by users. Consequently, adoption of the second component, perceived ease of use, is critical. It is described as "the extent to which a person believes that using a particular system would be easy" (Davis 1989, p. 319). The following diagram shows the overall procedure of the model (Fig. 4).

Table 2 Models for technology-related prominence

Theory/Model	Acronym	Author	Definition
Innovation Diffusion Theory	IDT	(Rogers 1962)	Describe the decision-making process in terms of innovation
Theory of Reasoned Action	TRA	(Fishbein and Azjen 1975)	Model the attitude-behavior relationships using an adaptable behavioral theory
Social Cognitive Theory	SCT	(Bandura 1989)	People learn by observing others, according to this learning paradigm
Technology Acceptance Model	TAM	(Davis et al. 1989)	A model that takes into account the psychological factors that influence technology acceptance
Extended Technology Acceptance Model 2	TAM2	(Venkatesh et al. 2000)	TAM2 has two hypothesized mechanisms social influence mechanisms and cognitive-instrumental processes are used to explain perceived usefulness and behavioral intentions
Theory of Planned Behavior	TPB	(Ajzen 1991)	This theory aims to predict an individual's intention to engage in certain behaviors at a specific time and location
Model of PC Utilization	MPCU	(Thompson et al. 1991)	This model makes predictions about how people use computers
Motivational Mode	MM	(Davis et al. 1992)	Researchers in psychology frequently employ this approach
Combined TAM and TPB	C-TAM- TPB	(Taylor and Todd 1995a)	This model is used to determine the impact of the aspects of social and control missing from TAM but present in TPB

Table 2 (continued)

| Theory/Model	Acronym	Author	Definition
Unified Theory of Acceptance and Use of Technology	UTAUT	(Venkatesh et al. 2003)	The purpose is to describe the user's objectives for using an information system, as well as the users' subsequent behavior
Unified Theory of Acceptance and Use of Technology 2	UTAUT2	(Venkatesh et al. 2012)	UTAUT2 is an extension of UTAUT, to give a clearer picture of new developing technologies and consumer ruse by the use of new constructs
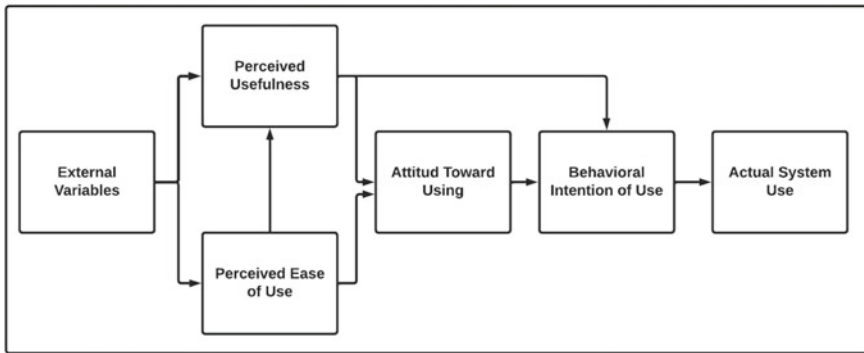
Fig. 4 TAM (Davis et al. 1989)

4.4 The Innovation Diffusion Theory

One of the well-known theories that have been used by numerous scholars to describe the term diffusion of innovations is used to spread of mobile technologies. This term is conceptualized in Everett Roger's 1962 book Diffusion of Innovations, which is also available in numerous editions. In his book, he describes the hypothesis by focusing on how, when, and why new technical innovations are accepted. Rogers's fifth edition (2003), diffusion is "the process in which an innovation is communicated through certain channels over time among the members of a social system". Moreover, for customers to embrace innovation, the right channels must be chosen to capture their attention. Although most innovation diffusion theory is pro-innovation that says new ideas or discoveries should be accepted by everyone without hesitation (Laukkanen et al. 2008). However, it appears that communication is the most significant motivating factor for consumers to adopt innovations Also, diffusion is a special type of communication, in which the messages are concerned with a new

idea. This newness of the idea in the message content of the communication gives diffusion to its special character. The newness means that some degree of uncertainty is involved (Rogers 2003).

Moreover, Ram and Sheth (1989) claim that consumers take a long time to internalize technologies that require them to make changes in their daily lives. According to Karsikko (2015, p. 21), the diffusion of innovations can lead to social changes such as adoption or rejection. On the other hand, consumers tend to believe that innovations are always better than old products or services before they are adopted, which is not always the case (Ates 2019; Laukkanen et al. 2008).

According to Rogers (2003), the four critical factors for innovation diffusion are invention, communication channels, time, and the social system. First, Rogers defines innovation as "An innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption" (Rogers 2003, p. 12). He also emphasizes that innovation is only recognized as an "innovation" if consumers view it as a novel. This chapter focuses on mobile payments, so there are many unique developments in the payments space. According to Smolarczyk (2018, p. 8), credit/debit cards, Internet banking, and bill payments are examples of cashless payment options. In addition, smartphone payments and mobile Internet payments have recently become available as cashless payment options.

According to Rogers (2003), three main steps in an innovation-decision process can influence the form of novelty, e.g., knowledge, persuasion, or the decision to introduce new tools or services. However, uncertainty seems to be the biggest barrier to adoption. More standards tend to slow down consumer adoption, most likely due to the uncertainty of service continuity or the number of competing plans and providers (Au and Kauffman 2008, p. 8). Rogers (2003) mentioned that uncertainties can lead to the adoption or rejection of an innovation. On the other hand, Rogers (2003) advises that customers must be fully informed regarding the benefits and drawbacks of the innovation to reduce the uncertainties associated with adopting the innovation.

4.5 The Decision Process of Innovation Adoption

Attitudes are influenced by perceived usefulness and ease of use (Davis 1989), and customers are also influenced by other factors. According to Mallat (2007), customers' decision to use a payment method is highly influenced by the number of other consumers and merchants using that method. For consumers to adopt innovations, it is crucial to get as much information as possible from the social environment. In his study, Rogers (2003, p. 172) argues that the innovation-decision process is easily characterized as one of minimizing uncertainty by thoroughly examining the pros and cons of the innovation. Since mobile payments are a new way for consumers to make payments, how the perceptions of individual consumers are changed and attracted depends on the experiences of early adopters. Because mobile payments are a novel system, building a sufficiently large base of customers and businesses
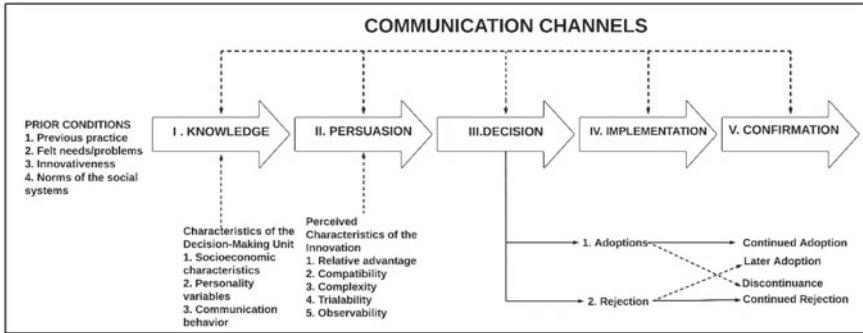
Fig. 5 The innovation-decision process: A five-stage model (Rogers 2003, p. 170)

that participate early is also a critical success criterion for mobile payments (Mallat 2007, p. 33).

The five-phase model of the innovation-decision process is often used to explain the innovation-decision process Rogers's (2003) diffusion of innovations hypothesis. The phases of this strategy are as follows: Knowledge Phase, Persuasion Phase, Decision Phase, Execution Phase, and Confirmation Phase. These stages are listed in chronological order. Figure 5 illustrates the specifics of the method.

A consumer goes through several stages before deciding to incorporate innovation into his or her life, as described above. The process begins with the discovery phase, where each consumer strives to learn more about the presence of innovation, as shown in Fig. 5. The persuasion phase occurs when the consumer has learned more about the invention and has an attitude that can be negative or positive. Once the consumer has completed the first two steps, he or she can decide whether to accept or reject the innovation. Furthermore, if a consumer-facing innovation, such as mobile payment, needs to be adopted, the implementation phase is practiced. Finally, once the customer has made a choice and may have tried it out, they always ask for advice on whether to continue or stop the adoption process (Rogers 2003, pp. 21–189).

4.6 Resistance to Innovation Model

Since the main objective is to find out the causes of resistance to innovations such as mobile payments, further research is needed to gain a comprehensive understanding of this issue. As shown in Fig. 6, a study by Ram and Sheth (1989) conceptualizes the barriers and determinants that influence the adoption of innovations.

Functional and psychological obstacles are the two key variables contributing to customer resistance, according to the model. Functional barriers are divided into three categories: usage barriers, value barriers, and risk barriers. According to Ram and Sheth (1989), these barriers occur primarily when consumers expect significant
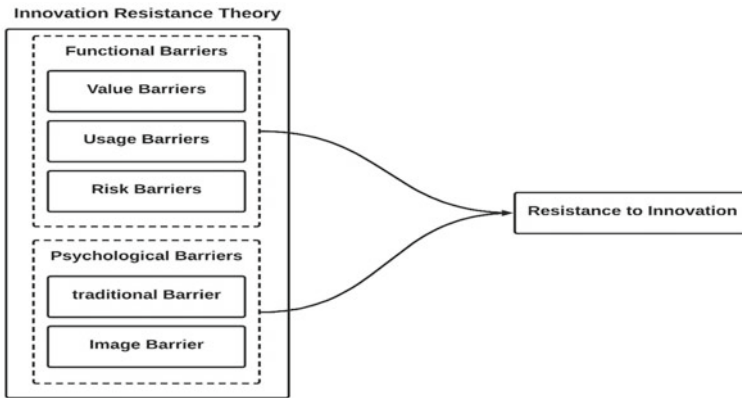
Fig. 6 Innovation resistance (Ram and Sheth 1989)

shifts from acceptance to innovation. Product use patterns, product value, and hazards related to product consumption can be used to explain functional barriers.

Traditional barriers and image barriers are other examples of psychological barriers. According to Ram and Sheth (1989), these barriers arise from the conventions and traditions of each consumer that shape his or her view of images of services or products. Thus, they derive primarily from the consumer's prior experiences and beliefs. It can be difficult to change these barriers because they are shaped by life events and ideals.

5 Mobile Payment Determinants

The study of factors influencing technology use and adoption has piqued the curiosity of researchers in all disciplines. Although there are numerous theoretical approaches to this topic, the most commonly used theory is the technology acceptance model (TAM) which explains user acceptance intentions and behaviors (Davis 1989). Davis and his colleagues (Davis 1989) theorize that perceived usefulness (PU) and perceived ease of use (PEOU) influence consumers' impressions of technology and thus their attitudes toward it, which in turn influence planned and actual adoption. Many scholars have added new constructs to the basic TAM such as PEOU and PU determinants, (Karahanna and Straub 1999; Venkatesh 2000a; Venkatesh et al. 2000, 2003; Venkatesh and Bala 2008), attitudes (Park and Kim 2014), and usage intentions (Yen et al. 2010), and intended use (Cham et al. 2021; Dotzauer and Haiss 2017; Feng et al. 2021; Gefen et al. 2003; Karahanna et al. 2006).

Many scholars (C. A. Lin 2009; Schepers and Wetzels 2007; Venkatesh 2000a) claim that the theory of reasoned action (TRA) influenced TAM (Fishbein and Ajzen 1975) because the key predictors of the TAM (PEOU and PU) are broader behavioral beliefs of the TRA (Karahanna and Straub 1999; Venkatesh 2000a). Intentions

modulate the external and internal beliefs' influence on behavior, according to the TRA. Later, Ajzen (1985) added perceived behavioral control (PBC) to the theory of planned behavior (TPB), which is influenced by the control's perceived strength component (c) and quantified by the intensity of each control belief. Later, Fishbein and Ajzen (2010) created an integrated model (IM) that combined the TRA, the TPB, and social cognitive theory (SCT). Despite minor nomenclatural differences, the IM and the TPB are quite similar.

(Taylor and Todd 1995a) integrated the TAM with the TPB, and later (Taylor and Todd 1995b) modified the TPB to develop the deconstructed TPB, using constructs from a diffusion of innovations theory (Rogers 2003), such as relative advantage, complexity, and compatibility. By deleting the mediator (attitude) and identifying several PU determinants - subjective norms, image, task relevance, quality of outcome, demonstrability of outcome, PEOU - and two moderators - experience and voluntariness. Venkatesh and Davis (2000) introduced the TAM2. Schepers and Wetzels (2007) extended the TAM2 to include subjective norms, personal innovativeness, IT, and computer anxiety. Venkatesh et al. (2003) combined eight closely comparable models (i.e., the TRA, the TAM, the motivational model, the TPB, a model combining the TAM and the TPB, the PC usage model (PC), innovation diffusion theory) to create the TAM2 and the (SCT) into a unified model, the Unified Theory of Acceptance and Use of Technology (UTAUT). According to the UTAUT, individual intention to adopt technologies is determined by performance expectancy, effort expectancy, and Social influence. Also, user behavior is predicted by facilitating conditions; age, gender, experience, and voluntariness of use influence. Subsequent researchers have added new variables to the UTAUT, such as social support (C. Lin and Anol 2008; Sykes and Venkatesh 2009) and perceived playfulness (Wang and Wang 2010). Venkatesh and Bala (2008) developed TAM3 by combining TAM2 (Venkatesh 2000b) and the Determinants of PEOU model first-stage anchors included computer self-efficacy, computer anxiety, enjoyment of computer play, and perception of external control [or facilitating conditions], and later adjustment included perceived enjoyment and objective ease of use, ostensibly noting the shortcomings of the previously proposed models (Venkatesh 2000). Venkatesh et al. (2012) proposed UTAUT2 by combining three constructs.: hedonic motives, affordances, and habits (see Table 3 for an overview of the distinctions between comparable theories).

Despite being one of the co-authors of TAM (Davis 1989), Bagozzi has vigorously attacked the foundations and advances of TAM (Bagozzi 2007). According to Bagozzi (2007), TAM research is on the verge of a crisis, if not a disaster in terms of understanding technological adoption. According to Bagozzi (2007), the research has not offered much in the way of new theoretical insight into the predictive and moderating mechanisms of TAM and its variants and extensions. While this criticism is severe, it may be justified when the origins of these theories are examined. The TAM and its derivatives, such as the UTAUT, TRA, TPB, and SCT (Bandura 1989), are all kinds of applications of expected value theory (EVT) (Atkinson 1957; Edwards 1954; Fishbein 1963; Fishbein and Raven 1962; Kahneman and Tversky 1979; Rosenberg 1956). As a result, these models share many commonalities (Bish

Table 3 Differences and commonalities among the theories

Construct	TRA	TPB	TAM	TAM2	TAM3	UTAUT	UTAUT2	IM
Attitude	Attitude	Attitude	Attitude	–	–	–	–	Attitude
Subjective norm	Subjective norms	Subjective norm	–	Subjective norm	Subjective norm	Social influence Effort	Social influence Effort	Attitude norm
Behavioral beliefs	Behavioral beliefs	Behavioral beliefs	Perceived ease of use	Perceived ease of use	Perceived ease of use	Effort expectancy	Effort expectancy	Behavioral beliefs
Outcome evaluation	Outcome evaluation	Perceived behavioral control	Perceived usefulness	Perceived usefulness	Perceived usefulness	Performance expectancy	Performance expectancy	Outcome evaluation
PBC-internal	–	–	–	–	Self-efficacy	–	–	Self-efficacy
PBC-external	–	–	–	–	Facilitating conditions	–	Facilitating conditions	–

Note "TRA = theory of reasoned action; TPB = theory of planned behavior; TAM = technology acceptance model; UTAUT = Unified Theory of Acceptance and Use of Technology; IM = integrative model; PBC = perceived behavioral control. In TRA, TPB, and IM, subjective norms are determined by the interaction of normative beliefs and motivation to comply

et al. 2000; Fishbein and Ajzen 2010), many different structures have the same meaning.

The original TAM assumes that key beliefs mediate the effect of environmental conditions on intention (i.e., PEOU and PU; Davis 1989). Although previous research has examined a variety of external variables, the literature finds no discernible pattern in terms of the external variables considered (Legris et al. 2003). In a meta-analysis of 107 studies, Abdullah and Ward (2016) found 152 external predictors of PU and PEOU, but they believe that only five external factors "self-efficacy, subjective norms, enjoyment, computer anxiety, and prior experience" are critical. Many of the proposed models (Raaij and Schepers 2008; Venkatesh 2000a; Venkatesh and Bala 2008) include a large number of exogenous PEOU or PU predictors. Despite this, factors could not be appropriate in all study contexts. For example, fun and fear of computers may not be key factors in the adoption of e-health products, e-government, or similar organizational applications, while fun or flow (or presence) may be more important than self-efficacy in the choice of game. As a result, even fewer variables are often required among the above external elements, and few hypotheses are as general as those stated in the literature. In addition, Williams et al. (2015) found that only performance expectancy was a significant predictor of technology use in the UTAUT. The UTAUT has also been attacked by Raaij and Schepers (2008) and Bagozzi (2007) for its complexity and illogical integration.

6   Discussion

The main objective of this chapter examined why the reluctance to accept mobile payments. In addition, this chapter sought to determine not only the opinions and potential customers' perceptions of mobile payments but also the notion of mobile payments and what types of changes or developments in mobile payments persuade customers to change their lifestyles.

One of the objectives of this chapter is to introduce the approach of Ram and Sheth (1989) when it comes to mobile payments. According to previous studies, the overall adoption of mobile payments is increasing in this new age of technology; therefore, it is important to examine the barriers to mobile payment adoption. In this study, functional barriers, psychological barriers and risk barriers, were found to be important in understanding consumer resistance to innovation.

This can summarize that the theories explained the phenomenon of adoption of the technology and how it has been created. Meanwhile, the theory of reasoned action (TRA) is a model that is not tailored to any particular behavior or technology. Therefore, it is limited in its ability to anticipate a particular behavior and agree on action, goal, context, and prediction time. Moreover, this theory has limitations because it neglects another aspect that influences behavioral intention. TAM and TAM2 both have a similar focus exclusively on the outcomes of two basic constructs and disregard other components that might promote the adoption of integration, flexibility, information completeness, and information actuality. In addition, the theory does

not address how beliefs influence behavior. Meanwhile, planning behavior theory (TPB) has failed to describe the individual process and how it relates to the model. Other variables that influenced behavioral intention and motivation were explained by the variables. Finally, the combination TAM-TPB did not account for the planning elements in the individual's behavior. Although the subjective norm of TPB and the perceived ease of use of TAM were introduced, the theory was not fixed or improved.

Based on the barriers, they provide information that solution providers can use to help identify their target customers. Since the potential of mobile payments is enormous. Solution providers need to work on and improve three aspects in particular: find the best approach to reach new customers and give them the right information, convince customers that mobile payments are just as secure as credit/debit cards and explain mobile payments' value so customers readily change their habits as soon as they discover the advantages of the new means of payment. Earlier studies, indicating factors that influence attitudes toward mobile payment adoption, particularly security, and trust concerns. Taking into account the customer concerns, it might be more efficient to attract and convince them to use mobile payments.

Finally, mobile determinants were examined. The original TAM is far too easy to explain most differences in usage intention, but many extensions of TAM are either overly technical or tautological. (e.g., performance expectancy and PU). Occam's razor mentioned it is redundant to have more hypotheses if a phenomenon can be satisfactorily characterized with fewer theories. Similar arguments are made by (Fishbein and Ajzen 2010, p. 282), who proposes that all newly proposed predictors are added and should meet requirements. In addition, the extended model TAM is expected to work across user categories, technology characteristics, country of study origin, type of technology, and year of the invention. So, the final model TAM plus is emphasize the uniqueness of extended TAM.

7 Conclusion

This chapter has especially highlighted the barriers to using mobile payment technology and resistance to mobile payment adoption. Mobile payments innovation is a major issue around the world, and it is predicted to change the entire payments sector. This is even though mobile payment systems are still in their infancy. For the first time, the less-researched viewpoint on the concept of innovation resistance, the factors that prevent people from adopting something, has been used in mobile payments research (value, risk, and traditional barriers) which slow down the use of mobile services.

The advancement of mobile technologies opens up a world of opportunities for new service enhancements but also presents several obstacles. The success of this invention depends primarily on consumer adoption and increasing market consolidation. It is, therefore, important to keep in mind that innovations require changes in customer behavior, which, as this chapter shows, can lead to consumer resistance.

It is important to remember that while mobile technologies are changing the world, these changes must be regarded with skepticism.

From a theoretical perspective, Ram and Sheth's 1989 model of innovation resistance is appropriate for evaluating innovation resistance behavior in the context of mobile payment. By providing a new perspective on mobile payments research, it adds to the literature. A sixth barrier was added to the original model, which contained five barriers. However, in the case of mobile payment, the additional barrier did not prove useful.

Consumer behavior theory is combined with a "technological framework in the technology acceptance model. From IDT in 1962 to the latest UTAUT2 theory in 2012, the technology acceptance model has continued to evolve. Due to the complexity of consumer behavior, most customer acceptance theories include moderating variables. Each theory or model has its strengths and weaknesses. The literature review of technology acceptance theories/models showed that each model has its assumptions and advantages, with UTAUT2 being the most comprehensive model to explore consumer technology acceptance and use. According to the results, UTAUT2 has an important role in technology acceptance research because it provides a sound basis for deciding whether consumers will adopt or reject a particular technology. The technology acceptance paradigm has been utilized in many academic investigations. They have also been shown to be more adaptable to the use of modeling technologies in mobile payment environments.

References

Abdullah F, Ward R (2016) Developing a General Extended Technology Acceptance Model for E-Learning (GETAMEL) by analysing commonly used external factors. Comput Hum Behav 56:238–256. https://doi.org/10.1016/j.chb.2015.11.036

Abrazhevich D (2004) Electronic payment systems: a user-centered perspective and interaction design. Technische Universiteit Eindhoven, Netherlands. https://doi.org/10.6100/IR575913

Ajzen (1985) From intentions to actions: a theory of planned behavior. In: Action control: from cognition to behavior. Springer, pp 11–39

Ajzen I (1991) The theory of planned behavior. Organ Behav Hum Decis Process 50:179–211

Amoroso DL, Magnier-watanabe R (2012) Building a research model for mobile wallet consumer adoption: the case of mobile Suica in Japan. J Theor Appl Electron Commer Res ISSN 7(1):94–110. https://doi.org/10.4067/S0718-18762012000100008

Antioco M, Kleijnen M (2010) Consumer adoption of technological innovations effects of psychological and functional barriers in a lack of content versus a presence of content situation. Eur J Mark 44(11):1700–1724. https://doi.org/10.1108/03090561011079846

Ates G (2019) What are the reasons for not adopting mobile payments? International Business Management with Fintech Focus.

Atkinson JW (1957) Motivational determinants of risk-taking behavior. Psychol Rev 64(6):359–372

Au YA, Kauffman RJ (2008) The economics of mobile payments: understanding stakeholder issues for an emerging financial technology application. Electron Commer Res Appl 7:141–164. https://doi.org/10.1016/j.elerap.2006.12.004

Bagozzi RP (2007) The legacy of the technology acceptance model and a proposal for a paradigm shift. J Assoc Inf Syst 8(4). https://doi.org/10.17705/1jais.00122

Bandura A (1989) Social cognitive theory annals of child development. In: Vasta R (ed) Volume 6. Six theories of child development. Greenwich, CT. https://doi.org/10.4324/9780429052675-22

Barakat A, Hussainey K (2013) Bank governance, regulation, supervision, and risk reporting: evidence from operational risk disclosures in European banks. Int Rev Financ Anal 30:254–273. https://doi.org/10.1016/j.irfa.2013.07.002

Bellis ED, Johar GV (2020) Autonomous shopping systems: identifying and overcoming barriers to consumer adoption. J Retail. https://doi.org/10.1016/j.jretai.2019.12.004

Bish A, Sutton S, Golombok S (2000) Predicting uptake of a routine cervical smear test: a comparison of the health belief model and the theory of planned behaviour. Psychol Health 15(1):35–50. https://doi.org/10.1080/08870440008400287

Ceipidor UB, Medaglia CM, Opromolla A, Volpi, V, Moroni A, Sposato S (2012) A Survey about User Experience Improvement in Mobile Proximity Payment. In: Fourth International Workshop with Focus on Near Field Communication, pp 51–56. https://doi.org/10.1109/NFC.2012.18

Cernev A (2010) Mobile banking in Brazil: critical events, trajectory and expected scenarios. PhD thesis. Getulio Vargas Foundation, Sao Paulo

Cham TH, Cheah JH, Cheng BL, Lim XJ (2021) I Am too old for this! Barriers contributing to the non-adoption of mobile payment. Int J Bank Mark, 0265–2323. https://doi.org/10.1108/IJBM-06-2021-0283

Chemingui H, Ben H (2013) Resistance, motivations, trust and intention to use mobile financial services. Int J Bank Mark 31(7):574–592. https://doi.org/10.1108/IJBM-12-2012-0124

Cheng BL, Cham TH, Micheal D, Lee TH (2019) Service innovation: building a sustainable competitive advantage in higher education. Int J Serv, Econ Manag 10(4):289–309. https://doi.org/10.1504/IJSEM.2019.10026652

Cocosila M, Trabelsi H (2016) An integrated value-risk investigation of contactless mobile payments adoption. Electron Commer Res Appl 20:159–170. https://doi.org/10.1016/j.elerap.2016.10.006

Dahlberg T, Mallat N, Ondrus J, Zmijewska A (2008) Past, present and future of mobile payments research: a literature review. Electron Commer Res Appl 7:165–181. https://doi.org/10.1016/j.elerap.2007.02.001

Dahlberg T, Mallat N, Öörni A (2003) Trust enhanced technology acceptance model -consumer acceptance of mobile payment solutions: tentative evidence. Stockholm Mobility Roundtable, 22–33

Davis FD (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS q: Manag Inf Syst 13(3):319–339. https://doi.org/10.2307/249008

Davis FD, Bagozzi RP, Warshaw PR (1989) User acceptance of computer technology: a comparison of two theoretical models. Manage Sci 35(8):982–1003. https://doi.org/10.1287/mnsc.35.8.982

Davis FD, Bagozzi RP, Warshaw PR (1992) Extrinsic and intrinsic motivation to use computers in the workplace. J Appl Soc Psychol 22(14):1111–1132. https://doi.org/10.1111/j.1559-1816.1992.tb00945.x

De Luna IR, Liébana-Cabanillas F, Sánchez-Fernández J, Muñoz-Leiva F (2019) Mobile payment is not all the same: the adoption of mobile payment systems depending on the technology applied. Technol Forecast Soc Chang, 146:931–944, August. https://doi.org/10.1016/j.techfore.2018.09

Dotzauer K, Haiss F (2017) Barriers towards the adoption of mobile payment services

Edwards W (1954) The theory of decision making. Psychol Bull 51(4):380–417

Featherman MS, Miyazaki AD, Sprott DE (2010) Reducing online privacy risk to facilitate e-service adoption: the influence of perceived ease of use and corporate credibility. J Serv Mark 3(April 2008):219–229. https://doi.org/10.1108/08876041011040622

Featherman MS, Pavlou PA (2003) Predicting e-services adoption: A perceived risk facets perspective. Int J Hum Comput Stud 59(4):451–474. https://doi.org/10.1016/S1071-5819(03)00111-3

Feng GC, Su X, Lin Z, He Y, Luo N (2021) Determinants of technology acceptance: two model-based meta-analytic reviews. In: Kuhl J, Beckmann J (eds) https://doi.org/10.1177/1077699020952400

Fishbein (1963) An investigation of the relationships between beliefs about an object and the attitude toward that object. Hum Relat 16(3):233–239. https://doi.org/10.1177/001872676301600302

Fishbein, Ajzen I (2010) Predicting and changing behavior: the reasoned action approach. Psychology Press

Fishbein M, Azjen I (1975) Belief, attitude, intention, and behavior: an introduction to theory and research. Addison-Wesley, Reading, MA. Contemp Sociol 6(2):244–245

Fishbein M, Raven BH (1962) The AB scales: an operational definition of belief and attitude. Hum Relat 15(1):35–44

Gefen D, Karahanna E, Straub DW (2003) Trust and tam in online shopping: an integrated model. MIS Q 27(1):51–90

Ghezzi A, Renga F, Balocco R, Pescetto P (2010) Mobile payment applications: offer state of the art in the Italian market. Info 12(5):3–22. https://doi.org/10.1108/14636691011071130

Gupta K, Arora N (2020) Investigating consumer intention to accept mobile payment systems through unified theory of acceptance model an Indian perspective. South Asian J Bus Stud 9(1):88–114. https://doi.org/10.1108/SAJBS-03-2019-0037

Hayashi BF (2012) Mobile payments: what's in it for consumers? Econ Rev 97(1):35–66

Heidenreich S, Handrich M (2015) What about passive innovation resistance? Investigating adoption-related behavior from a resistance perspective. J Prod Innov Manag 32(6):878–903. https://doi.org/10.1111/jpim.12161

Herault S, Belvaux B (2014) Privacy paradox et adoption de technologies intrusives Le cas de la geolocalisation mobile. Decis Mark 76:67–82

Hew J, Leong L, Tan GW, Ooi K, Lee V (2019) The age of mobile social commerce: an Artificial Neural Network analysis on its resistances. Technol Forecast & Soc Chang (September). https://doi.org/10.1016/j.techfore.2017.10.007

Hew J, Tan GW, Lin B, Ooi K (2017) Generating travel-related contents through mobile social tourism: does privacy paradox persist? Telematics Inform. https://doi.org/10.1016/j.tele.2017.04.001

Humbani M, Wiese M (2019) An integrated framework for the adoption and continuance intention to use mobile payment apps. Int J Bank Mark 37(2):646–664. https://doi.org/10.1108/IJBM-03-2018-0072

Jenkins B (2008) Developing mobile money ecosystems

Joachim V, Spieth P, Heidenreich S (2018) Active innovation resistance: an empirical study on functional and psychological barriers to innovation adoption in different contexts. Ind Mark Manag 71(March 2017):95–107. https://doi.org/10.1016/j.indmarman.2017.12.011

Johnson VL, Kiser A, Washington R, Torres R (2018) Limitations to the rapid adoption of M-payment services: understanding the impact of privacy risk on M-payment services. Comput Hum Behav 79:111–122. https://doi.org/10.1016/j.chb.2017.10.035

Kahneman D, Tversky A (1979) Prospect theory: an analysis of decision under risk. Econometrica 47(2):263–292

Karahanna E, Agarwal R, Angst CM (2006) Reconceptualizing compatibility beliefs in technology acceptance research. MIS Q 30(4):781–804

Karahanna E, Straub DW (1999) The psychological origins of perceived usefulness and ease-of-use. Inf & Manag 35:237–250

Karnouskos S, Fokus F (2004) Mobile payment: A journey through existing procedures and standardization initiatives. IEEE Commun Surv & Tutor 6(4):44–66

Karsikko H (2015) Drivers and obstacles in diffusion and adoption of mobile payments. Oulu University of Applied Sciences

Kaur P, Dhir A, Singh N, Sahu G, Almotairi M. (2020) An innovation resistance theory perspective on mobile payment solutions. J Retail ConsumServ 55(April):102059. https://doi.org/10.1016/j.jretconser.2020.102059

Kaymaz F (2011) User-Anonymität in Mobile Payment Systemen: Ein Referenzmodell zur Gestaltung der User-Anonymität in Mobile Payment Sytemen

Kerviler GD, Demoulin NTM, Zidda P (2016) Adoption of in-store mobile payment: are perceived risk and convenience the only drivers? J Retail Consum Serv 31:334–344. https://doi.org/10.1016/j.jretconser.2016.04.011

Khanra S, Dhir A, Kaur P, Joseph RP (2021) Factors influencing the adoption postponement of mobile payment services in the hospitality sector during a pandemic. J Hosp Tour Manag 46(November 2020):26–39. https://doi.org/10.1016/j.jhtm.2020.11.004

Kleijnen M, Lee N, Wetzels M (2009) An exploration of consumer resistance to innovation and its antecedents. J Econ Psychol 30(3):344–357. https://doi.org/10.1016/j.joep.2009.02.004

Laukkanen T (2016) Consumer adoption versus rejection decisions in seemingly similar service innovations: the case of the Internet and mobile banking. J Bus Res 69(7):2432–2439. https://doi.org/10.1016/j.jbusres.2016.01.013

Laukkanen T, Kiviniemi V (2010) The role of information in mobile banking resistance. Int J Bank Mark 28(5):372–388. https://doi.org/10.1108/02652321011064890

Laukkanen T, Sinkkonen S, Kivijärvi M, Laukkanen P (2008) Segmenting bank customers by resistance to mobile banking. Int J Mobile Commun 6(3):309–320

Legris P, Ingham J, Collerette P (2003) Why do people use information technology? A critical review of the technology acceptance model. Inf & Manag 40:191–204

Leong L, Hew T, Ooi K, Wei J (2020) Predicting mobile wallet resistance: a two-staged structural equation modeling-artificial neural network approach. Int J Inf Manag (November):102047. https://doi.org/10.1016/j.ijinfomgt.2019.102047

Lew S, Tan GW, Loh X, Hew J, Ooi K (2020) The disruptive mobile wallet in the hospitality industry: an extended mobile technology acceptance model. Technol Soc 23:101430. https://doi.org/10.1016/j.techsoc.2020.101430

Lin CA (2009) Exploring the online radio adoption decision-making process: Cognition, attitude, and technology fluidity. Jism & Mass Commun Q 86(4):884–899

Lin C, Anol B (2008) Learning online social support: an investigation of network information technology based on UTAUT. Cyberpsychol Behav 11(3):268–272. https://doi.org/10.1089/cpb.2007.0057

Liu R, Wu J, Yu-buck GF (2021) The influence of mobile QR code payment on payment pleasure: evidence from China. Int J Bank Mark 39(2):337–356. https://doi.org/10.1108/IJBM-11-2020-0574

Mallat N (2007) Exploring consumer adoption of mobile payments—A qualitative study. J Strat Inf Syst 16(16):413–432. https://doi.org/10.1016/j.jsis.2007.08.001

Mani Z, Chouk I (2018) Consumer resistance to innovation in services: challenges and barriers in the internet of things era. J Prod Innov Manag 35(5):780–807. https://doi.org/10.1111/jpim.12463

Momani AM, Yafooz WMS, Jamous MM (2017) The evolution of technology acceptance theories. Int J Contemp Comput Res (IJCCR) 1(1)

O'connor GC, Rice MP (2001) Opportunity recognition and breakthrough innovation in large established firms. Calif Manage Rev 43(2):95–116

Oliveira T, Thomas M, Baptista G, Campos F (2016) Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. Comput Hum Behav 61(2016):404–414. https://doi.org/10.1016/j.chb.2016.03.030

Pal A, Herath T, De R, Rao HR (2020) Contextual facilitators and barriers influencing the continued use of mobile payment services in a developing country: insights from adopters in India. Inf Technol Dev 26(2):394–420. https://doi.org/10.1080/02681102.2019.1701969

Pandy S, Crowe M (2014) Mobile payments industry workgroup meeting discussion on tokenization landscape in the U.S.

Park E, Kim K (2014) An integrated adoption model of mobile cloud services: exploration of key determinants and extension of technology acceptance model. Telematics Inform 31(3):376–385. https://doi.org/10.1016/j.tele.2013.11.008

Pinchot JL, Morris R, Paullet KL (2016) Exploring barriers to adoption of mobile payments for university students: lack of awareness, lack of availability, and perceived security risks. Issues Inf Syst 17(Iii):20–30

Porter C, Donthu N (2006) Using the technology acceptance model to explain how attitudes determine Internet usage: the role of perceived access barriers and demographics. J Bus Res 59:999–1007. https://doi.org/10.1016/j.jbusres.2006.06.003

Putritama A (2019) The Mobile Payment Fintech Continuance Usage Intention in Indonesia Niat Penggunaan Berkelanjutan dari Pembayaran Seluler Fintech di Indonesia. J Econ: Rev Bus Econ Stud 15(2):243–258

Rahman FBA, Hafiz M, Hanafiah M, Salehuddin M, Zahari M, Jipiu LB, Rahman FBA, Hafiz M, Hanafiah M (2021) Systematic literature review on the evolution of technology acceptance and usage model used in consumer behavioural study systematic literature review on the evolution of technology acceptance and usage model used in consumer behavioural study. Int J Acad Res Bus Soc Sci 1(13):272–298. https://doi.org/10.6007/IJARBSS/v11-i13/8548

Raja J, Velmurgan SM, Seetharaman, A (2008) E-payments: problems and prospects. J Internet Bank Commer (April 2008)

Ram S, Sheth JN (1989) Consumer resistance to innovations: the marketing problem and its solutions. J Consum Mark 6(2):5–15

Rogers, EM (1962) Diffusion of innovations "new product adoption and diffusion." J Consum Res 2:290–304

Rogers EM (2003) Diffusion of innovations, 5th edn. Free Press, New York

Rosenberg MJ (1956) Cognitive structure and attitudinal affect. Psychol Sci Public Interest 53(3):367–372

Roy S, Balaji MS, Quazi A, Quaddus M (2018) Predictors of customer acceptance of and resistance to smart technologies in the retail sector. J Retail Consum Serv 42(February):147–160. https://doi.org/10.1016/j.jretconser.2018.02.005

Ryu H-S (2018a) What makes users willing or hesitant to use Fintech?: the moderating effect of user type. Ind Manag Data Syst 118(3):541–569

Ryu H-S (2018b) Understanding benefit and risk framework of Fintech adoption: comparison of early adopters and late adopters. In: Proceedings of the 51st Hawaii International Conference on System Sciences |, pp 3864–3873

Sahi AM, Khalid H, Abbas AF, Khatib SFA (2021) The evolving research of customer adoption of digital payment: learning from content and statistical analysis of the literature. J Open Innov Technol Mark Complex, 1–25.

Sahi AM, Khalid H, Abbas, AF, Zedan K, Khatib SFA (2022) The research trend of security and privacy in digital payment. Informatics 9(32)

Samaradiwakara G, Gunawardena CG (2014) Comparison of existing technology acceptance theories and models to suggest a well improved theory/model. Int Tech Sci J 1(1):21–36

Schepers J, Wetzels M (2007) A meta-analysis of the technology acceptance model: investigating subjective norm and moderation effects. Information & Management 44:90–103. https://doi.org/10.1016/j.im.2006.10.007

Shao Z, Zhang L, Chen K (2020) Examining user satisfaction and stickiness in social networking sites from a technology affordance lens: uncovering the moderating effect of user experience. Ind Manag Data Syst 120(7):1331–1360. https://doi.org/10.1108/IMDS-11-2019-0614

Sivathanu B (2019) Adoption of digital payment systems in the era of demonetization in India An empirical study. J Sci Technol Policy Manag 10(1):143–171. https://doi.org/10.1108/JSTPM-07-2017-0033

Slade E, Williams MD, Dwivedi YK (2013) Mobile payment adoption. Classification and review of the extant literature. Mark Rev 13(2):167–190

Smolarczyk A (2018) Customer satisfaction with mobile payments. Aalto University School of Business

Stjepic AM, Pejic Bach M, Bosilj Vuksic V (2021) Exploring risks in the adoption of business intelligence in SMEs using the TOE framework. J Risk Financ Manag 14(2):58

Sykes TA, Venkatesh V (2009) Model of acceptance with peer support: A social network perspective to understand employees' system use. MIS Q(June 2014). https://doi.org/10.2307/20650296

Taylor S, Todd P (1995a) Assessing IT usage: the role of prior experience. MIS Q 19(4):561–570

Taylor S, Todd PA (1995b) Understanding information technology usage: a test of competing models. Inf Syst Res 6(2):144–176. https://doi.org/10.1287/isre.6.2.144

Thakur R, Srivastava M (2014) Adoption readiness, personal innovativeness, perceived risk and usage intention across customer groups for mobile payment services in India. Internet Res 24(3):369–392. https://doi.org/10.1108/IntR-12-2012-0244

Thompson RL, Higgins CA, Howell JM (1991) Personal computing: toward a conceptual model of utilization. MIS Q 15(1):125–143

Ting H, Yacob Y, Liew L, Ming, W (2016) Intention to use mobile payment system: a case of developing market by ethnicity. Procedia - Soc Behav Sci 224(August 2015):368–375. https://doi.org/10.1016/j.sbspro.2016.05.390

Van Raaij EM, Schepers JJL (2008) The acceptance and use of a virtual learning environment in China. Comput Educ 50:838–852. https://doi.org/10.1016/j.compedu.2006.09.001

Venkatesh V, Thong JY, Xu X (2012) Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS Q 36(1):157–178

Venkatesh V (2000a) Determinants of perceived ease of use: integrating control, intrinsic motivation, acceptance model. Inorg Chem Commun 11(3):319–340. https://doi.org/10.5962/bhl.title.33621

Venkatesh V (2000b) Determinants of perceived ease of use: integrating control, intrinsic motivation, and emotion into the technology acceptance model. Inf Syst Res 11(4):342–365. https://doi.org/10.1287/isre.11.4.342.11872

Venkatesh V, Bala H (2008) Technology acceptance model 3 and a research agenda on interventions. Decis Sci 39(2):273–315. https://doi.org/10.1111/j.1540-5915.2008.00192.x

Venkatesh V, Davis FD (2000) Theoretical extension of the technology acceptance model: four longitudinal field studies. Manage Sci 46(2):186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh V, Davis FD, College SMW (2000) Theoretical acceptance extension model: four longitudinal field studies. Manage Sci 46(2):186–204

Venkatesh V, Morris MG, Davis GB, Davis FD (2003) User acceptance of information technology: toward a unified view. MIS q: Manag Inf Syst 27(3):425–478

Venkatesh V, Thong JYL, Xu X (2012) Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS q: Manag Inf Syst 36(1):157–178. https://doi.org/10.2307/41410412

Wang H, Wang S (2010) User acceptance of mobile internet based on the unified theory of acceptance and use of technology: investigating the determinants and gender differences. Soc Behav Pers 38(707):415–426. https://doi.org/10.2224/sbp.2010.38.3.415

Williams MD, Rana NP, Dwivedi YK (2015) The unified theory of acceptance and use of technology (UTAUT): a literature review. J Enterp Inf Manag 28(3):443–488. https://doi.org/10.1108/JEIM-09-2014-0088

Wiradinata T (2018) Mobile payment services adoption: the role of perceived technology risk. In: 2018 International Conference on Orange Technologies (ICOT), pp 1–5

Yang Y, Yong L, Hongxiu L, Benhai Y (2015) Understanding perceived risks in mobile payment acceptance. IndManag & Data Syst 115(2):253–269. https://doi.org/10.1108/IMDS-08-2014-0243

Zhang L, Zhang C (2011) Management, engineering education and management. Springer-Verlag, Berlin, Heidelberg

Alaa Mahdi Sahi is a lecturer at the College of Administration and Economics, Wasit University, Al-Kut 52001, Iraq. Currently, he is a Ph.D. student at Azman Hashim International Business School, Universiti Technologi Malaysia, Johor Bahru 81310, Malaysia.

Dr. Haliyana Khalid obtained her Ph.D. in Computing, with a specialization in Human-Computer Interaction from Lancaster University, UK. She is a professional member of Association Computing Machinery (ACM) and my HCI-UX. She holds a professional certificate in Marketing (CPM, Asia). The combination of IS, UX and marketing knowledge, plus her strong passion in social media has led her to actively involved in research and consultancy in digital user experience. She is a webmaster, digital content strategist, and developer. She also has experience in managing ERP project prior her appointment in AHIBS. Her publication ranges from information systems to social media marketing. She is one of the fellows of the CEO@Faculty Programme 2.0, a national initiative by the Ministry of Higher Education, aims to create collaboration between industry and academia. Under this program, he was selected to be part of the Proven Holding Group and was stationed in FashionValet.com.

Alhamzah F. Abbas is a Ph.D. student at Azman Hashim International Business School, Universiti Technologi Malaysia, Johor Bahru 81310, Malaysia. He published many papers in several high-impact journals such as sustainability journals.

Green Practices in Marketing

Ahmed Mahdi Abdulkareem and AlokKumar Chakrawal

1 Introduction

Green marketing is the activity of creating and selling products and services that have environmental advantages. In the current context, more companies use green marketing, while cities are constantly evolving and customers are more familiar with green marketing, but not in village areas. All countries in the world are taking the necessary measures to limit the use and pollution of plastics (Amoako et al., 2022). Green marketing makes use of items that are beneficial to the environment and reduce carbon emissions (Janssen & Jager, 2002). However, environmental challenges have an impact on all human activities, and few academic fields have investigated environmental themes in terms of marketing. This is particularly true in the field of marketing. Companies have begun to alter behavior in response to society's rising concern about the environment. Several businesses have swiftly embraced environmental management. Environmental considerations are incorporated into all organizational processes, particularly systems and minimization of waste (Moruzzi et al., 2013).

Green marketing is seen as a successful and cutting-edge trend. Consequently, it is more successful in terms of protecting people and the environment. In the 1980s, Green Marketing becomes fashionable. The American Marketing Association (AMA) conducted the first meeting held on "Environmental promoting" in the year 1975. "Ecological Marketing," the first book on green marketing, was one of the session's outcomes. Green marketing is referred to as environmental marketing or

A. M. Abdulkareem (✉)
Al-Kunooze University College, Basra, Iraq
e-mail: ahmed.m.abdulkareem@kunoozu.edu.iq

A. Chakrawal
Department of Commerce and Business Administration, Saurashtra University, Gujarat 360005 Rajkot, India

ecological marketing (Lakshmanan, 2012). Nowadays, the demand of natural products has been rising due to health-related aspects and avoidance of chemical used products (D'Souza et al., 2006). The demand of pure products likes fruits, vegetables, and routinely used product has also increased. This happened due to green marketing. People also reduce the use of plastic-based products that are dangerous for the soil of earth. People aware about the use of herbal and natural products with the exchange of process-based products. This happened due to green marketing (Jaideep, 2022).

2 Literature Development

2.1 Basic Things About Green Marketing

The practice of creating and selling ecologically friendly products and services is known as green marketing. Product adaptation, manufacturing process improvements, packaging alterations, and advertising tweaks are all examples of green marketing (Albahir et al., 2022). On the other hand, green marketing is a challenging issue to adopt. The terminology like green marketing, environmental marketing, and ecological marketing was used in this sector of marketing to be referred for the green marketing. Green marketing became fashionable in the late year of 1980s and early in the years of 1990s, but it had been discussed for a long time (Polonsky, 1994). According to the American Marketing Association, "green marketing as efforts by business or organizations to produce, promote, package, and reclaim products in a manner that is sensitive or responsive to ecological concern" (Binsawada, 2020). Many studies have used the double technique SEM and ANN methodologies to explore green marketing strategies. For example, determinants of customers' intentions to purchase environmentally friendly cars were identified (Naimi et al., 2021). However, literature has adopted the SEM-ANN approach to investigate smartphone recycling programs. Due to government pressures from many countries on companies, the industry faces enormous challenges represented in the introduction of green practices in marketing processes in order to reduce environmental pollution (Higuera-Castillo et al., 2020).

2.2 Characteristics and Green Marketing Mix

Customers consume many products and services. As a result, businesses are finding it difficult to achieve a competitive edge by concentrating on sustainability and developing environmentally friendly products and services. To this purpose, green marketing has a number of qualities, which are listed below (Polonsky, An introduction to green marketing, 1994).

- Locally farmed products manufactured using natural ingredients.

- The products produced in the factor like ozone friendly, organic, recyclable, non-toxic, appropriate chemical content, printed with a minimal carbon footprint, carbon neutral, and reusable.
- Products that don't harm to environment, as well as those that are not tested on animals, are all desired chevaliers.
- Products which packaged in ecologically responsible ways, such as reusable and refillable containers.

Companies use a green marketing mix to maximize commercial opportunities, increase brand loyalty, and establish a competitive reputation (Baker, 2003).

- **Product:** It is basic knowledge that all forms of manufacturing take energy and produce trash. As a result, green marketing might be an outstanding marketing strategy that the company has adopted.
- **Price:** Prices are crucial in green markets because many customers are willing to get products at a high cost and of superior quality in terms of design, performance, smell, attractiveness, and others.
- **Promotion:** Commercials that explain the link between the product and the environment, advertisements that encourage organic and green lifestyles, and advertisements that demonstrate corporate environmental responsibility are all examples of green advertising.
- **Place:** Although location determines product availability, marketers should select the most effective method for making items available to their customers.

2.3 The Role of Green Communication

The promotional value of green marketing communication is high. This implies that green marketing media, supports, and messaging must persuade customers and the general public to adopt and use green products. Purchasing eco-friendly goods leads to increase in demand for green products. Furthermore, with the help of green communication, the goal of promotional communication is to establish and improve the company's green image. Hence, green communication plays a significant role in achieving these key aims. Green marketing has played an important role in bridging the trust gap as well as addressing green information asymmetries (Victor, 2012). Public and customers are frequently dubious of businesses' green initiatives and tactics. Thus, it appears that the company' capacity to persuade price-sensitive customers to adopt green products has greater importance than technical, economic, saving, or other impediments to having green products.

Green communication asymmetries are another motivator for excellent green communication. The firm must recognize that customers and the public are partners and beneficiaries, and that serving their green needs is the most essential aim and source of corporate existence. This necessitates an engaging green communication strategy as well as financial, human, and management resources. These efforts

aim to create a more balanced flow of information and correct asymmetries in green communication between market actors and their actions (Danciu, 2012,).

2.4 The Green Push–Pull Communication Strategies

The success of the approach has an impact on the persuasiveness of the green message. In the green marketing research, the three following green communication methods are noted: educate the customer, empower the consumer, and convince the consumer. A educate consumer approach refers to attempts to educate consumers about environmental and living concerns that a green solution can solve as a response to consumer demands or as a consequence of a corporate endeavor by giving the necessary knowledge. The primary purpose of educational communications is to increase purchase intent. The concept of empowering customers with green solutions entails showing them how environmentally friendly products and services may assist them in protecting lives and preserving the environment for future generations. As a result, this communication strategy contributes to the green marketing's long-term viability. There are at least two approaches to persuading customers (Danciu, 2012).

Push communication tactics involve information flowing from producers through successive connections in the distribution system in order to enhance green products. Push and pull promotional mixes deliver explicit and implicit signals to customers. The green promotion mix with effects could include various combinations of selling such as help of a salesman, negotiating with retailers to the organization's product and services, utilizing effective supply chains to ensure effective supply for retailers, and promotions purchase. Communication messages feed the marketplace, and demand creation is essentially non-existent (Danciu, 2012). Advertising and mass media, word of mouth, customer relationship management, sales promotions, and discounts might all be used to create pull promotional combinations. The firm requires a strong brand to have successful push–pull effects from its green marketing strategies (Danciu, 2012).

2.5 The Green Communication Strategies and Pull–Push Effects

Green communication tactics have a wide range of consequences. All three green communication techniques attempt to do more than fulfilling the core marketing promotion functions of informing, convincing, and deciding. Green communication would increase by educating and equipping consumers with environmentally friendly alternatives. The increase in green purchase and consumption is one of the push–pull effects of communication methods. Green communication media,

supports, and messages have a push–pull influence on individual and societal well-being by providing better information and more substantiated arguments to persuade customers to buy green products and businesses to invest in green. These benefits are shaped through emphasizing current and new green brands, as well as the marketing methods' contributions to decreasing pollution, protecting fauna, enhancing housing, lifespan, and health (Mazar & Zhong, 2010).

Green products use less raw resources, make less waste, and save energy. Green products are more energy efficient, perform better, are more convenient, and are safer. Organic items are safer and have a better flavor, while recycled paper or plastic saves money, and solar-powered cell phones have a longer lifespan and save waste. The benefits of hybrid automobiles include a peaceful ride, fewer fill-ups, decreased pollution, and increased prestige. In order to contribute to improved impacts on the business's green objectives, green communication should focus on these effects and emphasize them in promotional communications. The environment benefits greatly from green marketing tactics, including the communication strategy. Green communication that is well coordinated might help to improve the physical environment. Deforestation will be minimized, natural resources will be depleted, and landfill rates will improve. Deforestation will be minimized, natural resources will be depleted, and landfill rates will improve. Global warming will be slowed, air, water, and soil pollution will be reduced, waste energy will be depleted, and new sources of green energy will be developed, waste energy will be depleted, and new sources of green energy will be developed, waste energy will be depleted, and new sources of green energy will be developed, waste energy will be depleted, and new sources of green energy will be developed (Biswas & Roy, 2015).

The green product is a means of achieving the goal of contributing to long-term sustainable development. The sustainable product strategy influences the intense utilization of natural and energy resources. On the one hand, perishable raw materials might be substituted with longer-lasting alternatives. Renewable resources may be put to better use, such as replacing crude oil with solar or wind energy to generate electricity. Durability becomes a source of added value, a quality indication, and contributes to lower raw material usage (Polonsky, 1994).

2.6   Openness of Green Marketing

Internal product and company issues, as well as external consumer issues, are frequently the most pressing concerns for marketing managers. Externally, environmental analysis encompasses various, although interrelated, aspects of the environment. Due to their increasing width and complexity, as well as their diminishing proximity to the organization, dealing with the deeper levels of the environment is undoubtedly a more challenging strategic challenge. The global socio-economic system has no geographical bounds; the biosphere is indeed global. Global corporations, markets, technology, and sociocultural tendencies have mirrored a more global social outlook in recent decades. Increased global environmental regulations and

intergovernmental conferences have also helped to promote a more global approach to the green challenge (Baker, 2003).

To this end, the difficulty of negotiating and implementing international agreements to address common environmental issues was highlighted during the Intergovernmental Conference on Climate Change in Kyoto, Japan, in 1997. Concern about business's environmental and social implications is growing across civilizations and manifesting in a variety of ways such as shifting of values and attitudes. Many societal norms have shifted during the previous few decades, notably in terms of faith in corporations and other organizations. According to Edelman PR's global social attitude study, 60% of people believe information from non-governmental organizations on environmental, human rights, and health concerns compared with each other to 15% that trust the government and media (Maniatis, 2016).

Pressure group activity has expanded in number, finance, and complexity over the last 20 years, particularly among pressure groups concerned with the socio-environmental implications of enterprises. Many public relations efforts are now created by the same firms that work for Fortune 500 firms. Companies with well-known brand names are more likely to be targeted, as seen by Nike and Gap's experiences with international labor standards (Westley & Vredenburg, 1991). Investments in environmental preservation were once thought to be incompatible with economic growth, according to conventional thinking. Better environmental protection will be required for long-term economic prosperity. To solve and alleviate environmental concerns, many new economic possibilities for technology, commodities, and services are developing. Environmental businesses, according to the European Commission, would be valued six hundred and forty billion dollar by 2010 and will employ five lakh people in Europe (Lin & Huang, 2012).

The profitability of various front-line businesses, such as autos, chemicals, and power generation, is being impacted by environmental concerns. Rising landfill prices and stricter emissions restrictions show that manufacturing costs are determined more by what is abandoned during the manufacturing process than by what is utilized in the end product. Many nations are introducing a new generation of environmental taxes, such as landfill fees and climate change levies. Product-specific levies are also being used to encourage specific changes in consumer behavior, such as the usage of reusable shopping bags. Lenders and investors regard environmental performance as having a significant impact on risky businesses. In order to have access to capital and insurance, a strong environmental strategy is becoming increasingly vital in a variety of environmentally sensitive businesses (Baker, 2003').

2.7 Industrial Framework

Traditionally, industry structures have been shown as linear exchanges and value chains. One of the forces pushing for a more relationship-based approach to industry structures, notably through recycling and supply loops, is the green challenge. These are customer-to-manufacturer relationships in which the consumer returns items or

packaging. New substitutes may be targeted for products with poor environmental performance. As markets that were previously centered on product purchase and ownership shift to more usage of services, hiring, and leasing, a more radical set of replacements may develop in the future (Tseng & Hung, 2013). Many companies struggle to build relationships with suppliers in order to stimulate green products, because environmental issues and challenges are critical in the procurement stages. Therefore, companies adopt many techniques such as life-cycle analysis and environmental supplier audits to analyze environmental performance (Baker, 2003').

Global rivalry and continual improvement mindsets have limited product differences to the point where softer variables like environmental effect can help buyers choose between companies. Disaster in environment such as oil spills, or chemical plant leaks, has demonstrated that stakeholder pressure on all economic players increases. Many important environmental challenges have ramifications for whole industries, necessitating industry-wide solutions. Rival coalitions are formed to address comparable environmental concerns and provide more environmentally friendly solutions (Ritter et al., 2015). Businesses of all sizes are being driven to change a number of organizational aspects in response to external concerns about socio-environmental consequences. Some of the most common solutions include the appointment of environmental managers, changes to corporate policies and infrastructure to decrease waste and pollution, as well as the creation of green auditing and reporting systems. Green issues are becoming more prominent in business goals and cultures. Marketers may be pressured by external customers or regulatory obligations to address the eco-performance of the goods. Several firms have implemented modifications in response to the green challenge, including autos, cleaning goods, and paper products (Nuttavuthisit & Thøgersen, 2017).

2.8   The Relationship Between Altruism and Customer's Intention to Purchase Green Product

Altruism has an impact on green purchasing intentions. Green purchasing intentions are influenced by one's attitude toward buying green and one's level of health consciousness. Simultaneously, compassion and a positive attitude about purchasing green products influence green purchase intention. Furthermore, health consciousness influences attitudes toward purchasing environmentally friendly items in a beneficial way (Chi et al., 2020). Green products are impact environmentally friendly, pollutant, recycled, and conserved (Mostafa, 2006). Green consumption behavior refers to consumer actions that do not pollute the environment, deplete natural resources, or use recyclable materials (Kenzie, 2005). Customer altruism is described as customer conduct that prioritizes others' sentiments or prioritizes others' pleasure in situations involving their action (Schwartz, 1977). Furthermore, (Kumar et al., 2020) believe that altruism will assist consumers in controlling their actions connected to maintainable expansion. Customers are stated to be willing to assist

others and constantly worried about the atmosphere. As a result, customers that are well informed about sustainable development will be more altruistic (Kumar et al., 2020).

2.9 Theory of Planned Behavior

According to the concept of planned behavior, people desire to act in a certain way. The research of planned behavior indicated that recycling, mode of transportation, energy consumption, water conservation, food selection and ethical investing all are instances of pro-environmental behavior (Ajzen, 1991) (Fig. 1).

The theory of planned behavior assists programmers in developing solutions that successfully target a certain behavior. This theory includes three factors: behavioral, normative, and control. Perceptions have an impact on whether a person has a favorable or negative attitude toward an activity, as well as how they think about positive and bad outcomes. Normative beliefs lead to a sense of social or peer pressure, as well as a subjective norm. Control beliefs influence behavior performance, resulting in behavioral control (Primer, 2020). Purpose is established when attitudes toward behavior, subjective standards, and perceived behavioral control are all combined. Understanding these ideas and the intents generate might help firms to improve behavior of customers. Consider using the philosophy of planned performance to develop intrusions that target socially unacceptable health-promoting individual behavior, such as smoking cessation, self-checkups, volunteer testing, medicine-devotion, and other behaviors that require singular decisions but have fluctuating levels of communal suitability. Furthermore, when a person possesses all three of the characteristics, their intentions are more powerful. However, a variety of
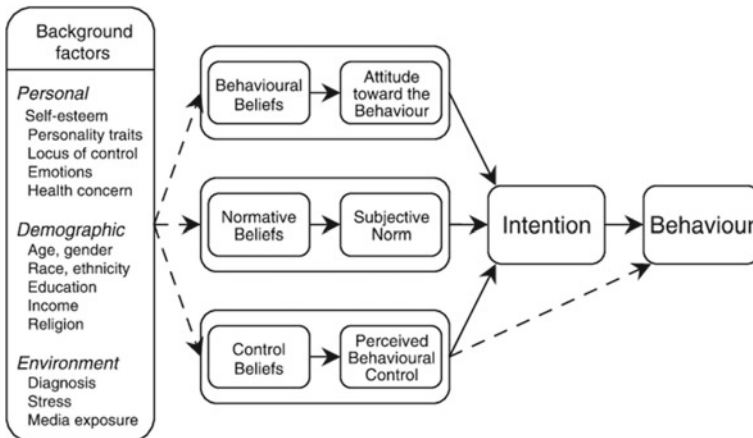

Fig. 1 Flowchart of theory of planned behavior (*Source* Flowchart adopted from [Ajzen I., 2022])

external causes and constraints might prohibit from engaging in an activity (Primer, 2020).

2.10 Value-Attitude-Behavior Cognitive Hierarchy in Green Marketing

Among the most researched issues in social psychology is the interaction between values, attitudes, and action. By proposing a causal model on the influence of values, attitudes, and deeds, Homer and Kahle (1988) attempted to incorporate the inter-relationships among standards, arrogances, and behaviors and based on the Homer and Kahle paradigm standards, arrogances, and behaviors are influenced in a defined sequence, according to Milfont et al. (2010). Social institutions such as national laws, markets, and incentive structures, according to Stern's model, impact the formation of an individual's values. New attitudes and ideas concerning specific environmental problems, such as recycling, composting, and purchasing green products, emerge from belief systems and worldviews that form the foundation of general knowledge. These attitudes and behaviors have an impact on behavioral commitments and intentions, which eventually impact on environmental practices (see Fig. 2).

2.11 Open Issues and Challenges of Green Practices in Social Commerce

Green marketing is similar to traditional marketing in terms of its fundamental goal of satisfying customers and the marketing activities involved. The concepts and ideologies that govern promotional campaign, as well as the methods in which certain promotional aspects are addressed, are some of the fundamental contrasts between the two (Peattie, 1999). Green marketing aims to strike a balance between a techno-economic commercial point of view and a larger environmental and social one. Because of marketing's historical role in promoting economic development and addressing customer requirements, the advantages of ever-increasing consumer preference and economic expansion have gone uncontested. Mulhern promotes emphasizing customer welfare above consumer needs. Issues like passive smoking and automotive safety have highlighted marketing's incapacity to meet the demands and welfare of non-consumers.

Green marketers must also reevaluate their approach to customers. Green marketing needs to strike a balance between a techno-economic commercial point of view and a larger human and ecological one. Because of marketing's historical role in strengthening the economy and addressing customer requirements, the advantages of always purchase decision and economic expansion have gone unchallenged. Many customers avoid using products that have environmental damage and the possibility
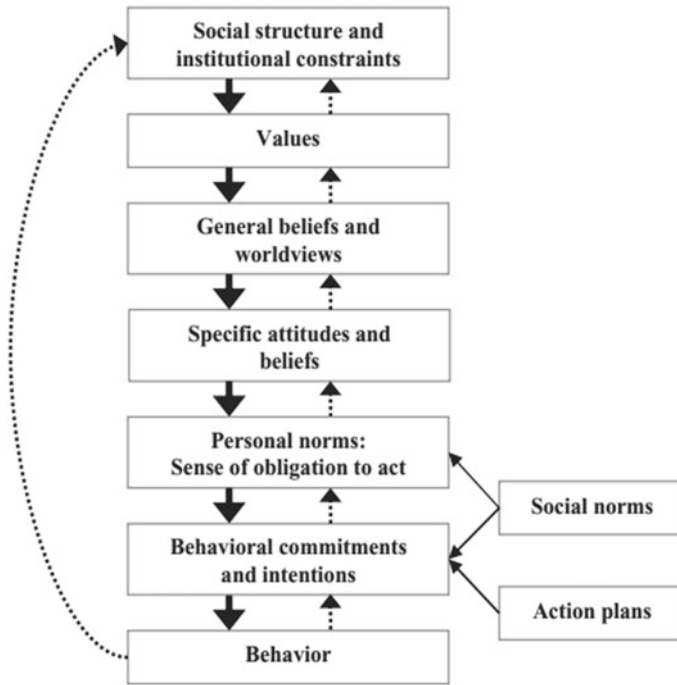
Fig. 2 Flowchart of Value-Attitude-Behavior Cognitive Hierarchy (*Source* Author adopted from [Milfont et al., 2010])

of environmental pollution. Customer satisfaction becomes increasingly dependent on the production process. Customers are considering the green marketing aspects are best practices of sustainability of firms regarding products and services (Peattie K., 1999).

Producer obligations were formerly assumed to be restricted to maintaining that products were fit for purpose, accurately portrayed, safe, and not overpriced or pushed to exploit people. Awareness of environmental issues has brought in a new degree of accountability, compelling manufacturers to consider a product's fate at the end of its useful life, a factor that was historically immaterial to marketers other than signaling the prospect of a new purchase. These new standards will have a considerable influence on product development and supply chain management for consumer durable goods such as automobiles, home appliances, and consumer devices (Peattie K., 1999). Environmental sustainability may be influenced by external factors like regulation, consumption patterns, and popular sentiment, as well as internal environment such as senior management engagement, company strategy, and the goal of competitive edge (Bannerjee, 1999).

Creativity, the capacity to operate successfully across internal organizational barriers and great communication skills are all required for the greening challenge. Marketers can notice and analyze trends; they are sometimes said to as "superbly

qualified" for the job. Opportunity for new products and services results from the same environmental factors and efforts. Therefore, marketers may seek to ensure that the marketing implications of business environmental policies are considered. Furthermore, marketers have to naturally coordinate their activities across multiple sectors, including R&D, manufacturing, wrapper, sales, and community engagement. This ability is important for environmental management in order to enhance undertaking force, organization training, and emergency response exercise (Peattie K., 1999).

2.12   The Practical Challenge for Greening Marketing Mix

A variety of new and greener goods and technology will be required to establish a considerably greener economy. Instead of trying to mitigate the environmental and social implications of existing goods and technologies, clean technology solutions are becoming more imaginative. This is shown in the incorporation of eco-performance requirements into many sectors' new product development processes through ideas such as environmental design. High degrees of merge collaboration and coordination, ample information, early examination of environmental issues, top management backing, and a distinctive measuring and benchmarking strategy are all required for the introduction of unique green products and services (Pujari et al., 2002). The environmental and societal consequences of a product or service interaction are addressed through green product qualities. These features might include fuel efficiency, durability, and safety while driving, and recyclability. From a green standpoint, paying attention to the product's fate after use is a crucial new component of product management and design, enhancing a product's post-use environmental implementation of proposed some or all of the "five R's" into the design. Repairing items may be cost-effective and extend their service life when done using a modular design philosophy and competent after-sales service. The second phase is refurbishment. From tires to engines, remanufactured parts are easily available in the vehicle industry. Reuse on average, a bottle of cow's milk is reused 12 times. Recycle everything is now engineered to be more recyclable. Remanufacturing many firms gathers and remanufactures many products (Peattie K., 1999). The attributes that relate to the product's production techniques and the company's characteristics make up the second group. Core product (which includes packaging and other physical attributes) is an example of cultural marketing (including service-dimensions). Therefore, green marketing necessitates a product management strategy that considers the manufacturing process as a product feature (Ottman, 1995).

The difficulty in designing fully sustainable goods is to increase environmental while maintaining appropriate functionality and service at a reasonable price. Rather than employing "end-of-pipe" solutions, which are invariably more expensive, firms take a cleaner strategy that entails adopting cleaner technologies that design waste out of industrial processes (de Medeiros et al., 2016). In developed nations, discarded

packaging accounts for a big part of trash and a significant portion of the environmental impact of many items. Many firms' green marketing initiatives have started with packaging, which can frequently be safely decreased without requiring costly changes to the product. Basic goods and industrial methods do not endanger customers. Varian Medical Systems is a major medical equipment manufacturer. Medical diagnostic system was altered to enable for product shipment packing. Previously, many boxes could easily be nested. This modest step saved the company a lot of money. In fact, success may be more challenging than in principle, as it is with many areas of green marketing (Yadav & Pathak, 2016).

2.13   Promotion of Green Marketing

Many businesses have sought to promote their products by relating them to environmental and social concerns, either directly or indirectly. Nevertheless, one of the most difficult aspects of the green marketing strategy has been promotion. Green products have been accused of having simple solutions to complicated environmental concerns in traditional advertising. The discovery of inaccurate and misleading statements has heightened concerns about green washing (Baker, 2003). As a result of these concerns, the term sustainable communications is gaining traction. Sustainable communications emphasize a conversation with stakeholders, particularly consumers, with the goal of informing, educating customers, establishing the company, and enhancing environmental credentials (Baker, 2003). Integrated communications are becoming more widely recognized as a critical component of marketing success. Communications' crucial aftermath businesses are trying to defend social environmental concerns. Thus, the goal is to comprehend stakeholder audiences' problems before communicating effectively and efficiently (Baker, 2003). Pricing is at the heart of the green marketing conundrum in many ways. There would have been great encouragement for firms to reduce costs and be more responsible if the external social and environmental expenses of manufacturing were reflected in the cost that customers paid. Corporations that pass on the expenses to their client's risk being accused of exploiting their demand for green pricing. Customer adoption of green products may enable for green pricing surcharges to be included (Baker, 2003).

The amount of fuel and resources required to transport many products has a significant impact on the environment. The installation of carbon taxes on the usage of fossil energy would have a considerable influence on distribution economics. Corporations will be incentivized to replace international manufacturing and distribution networks with international reach of institutions that develop and distribute locally or regionally (Brécard et al., 2009). It may be challenging to attain advantageous environmental sustainability in distribution. Decreased package density, for example, might lower the number of resources needed in distribution, but it may also enhance channel wastage owing to the manufacturer's vulnerability. Larger cars consume less energy per unit of product moved, yet they have a higher deleterious effect on

highways and cities. The new legislation forcing companies to return goods and abandoned packaging would require a massive overhaul of distribution systems to handle the logistics management of recycling container and gathering waste and final products (Baker, 2003').

In green marketing, labeling has long been a hot subject, with consequences for both promotion and logistics. Green stickers are a popular marketing strategy that enables the client to quickly understand a product's social and environmental credentials, labeling programs with a lengthy tradition on the national stage (Chen & Hung, 2016). There are also more specialized schemes dealing to certain industries or items, Rug-mark carpet created without working children, ecological certified from the Soil Association, or corporate conduct, such as fair-trade accreditation. Regardless of matter why a company chooses green marketing, there are a number of possible difficulties that it must solve. One of the most significant challenges is that green marketing organizations must ensure that their activities are not dishonest to clients or the business. Businesses all throughout the country must ensure that their green assertions meet the following requirements. To address the basic need of green marketing in environment friendly materials, green marketers wish to establish the following characteristics (Baker, 2003).

- Describe how advantages are obtained.
- Ensure that comparative differences are justified.
- Ensure that negative variables are considered.
- Use only understandable language and illustrations.

Another challenge that firms face is that when they update their products in result of increased consumer concern, they must cope with the fact that their consumers' perceptions are not correct. A scientific debate regarding whether it is more environmentally helpful is ongoing. When examined from cradle to grave, polystyrene is less environmentally hazardous, based on scientific research. When businesses try to become more socially responsible, firms run the danger of the current environmentally responsible actions being shown to be damaging in the future (Mazar & Zhong, 2010). Organizations may not be compelled to handle the significant problem of environmental deterioration due to the drive to decrease costs and maximize efficiency. Final remedies may not be effective in reducing waste. Because most of the garbage created will end up in the waste stream. Hence, environmentally conscious businesses should try to reduce the waste by providing green products and services (Baker, 2003).

3 Conclusion

The entropy of the environment issue has become disordered because of mankind's terrible deeds, necessitating strong and clever responses. Green marketing may help to establish a variety of tactics that aid in environmental preservation and enhancement of quality of life. A new green marketing paradigm includes various areas of

action, such as its commitment to environmental preservation and sustainable development. In addition, consumer and company activities are needed to achieve the greatest outcomes (Lakshmanan, 2012). Green marketing entails something more than company's promotional claims, while corporations must shoulder a significant portion of the burden for degradation of the environment.

References

Ajzen (1991) The theory of planned behaviour. Organizational behaviour and human decision process, 179–211.

Ajzen I (2022, May 26) Research Gate. Retrieved from www.researchgate.com: http://surl.li/cbijv

Albahir AS, Alnoor A, Zaidan AA, Hameed H, Albahri OS, & Zaidan BB (2022) Hybrid Artificial neutral network and structural equation modelling technique; A survey. Comple Intell syst, 1781–1801.

Baker MJ (2003) The Marketing Book. Burlington: Butterworth-Heinemann.

Bannerjee (1999) Corporate environmentalism and the greening of marketing. Implications for theory and practice, in charter, M.J. and Polonsky, 45–89.

Binsawada MH (2020) Corporate social responsibility in higher education: A PLS-SEM neural network approach IEEE access. Corporate Responsibility, 29125–29131.

Biswas A, Roy M (2015) Green products: an exploratory study on the consumer behaviour in emerging economies of the East. J Clean Prod 87:463–468

Brécard D, Hlaimi B, Lucas S, Perraudeau Y, Salladarré F (2009) Determinants of demand for green products: An application to eco-label demand for fish in Europe. Ecol Econ 69(1):115–125

Chen SC, Hung CW (2016) Elucidating the factors influencing the acceptance of green products: An extension of theory of planned behavior. Technol Forecast Soc Chang 112:155–163

Chi TK, Minh D, & Thien V (2020) Factors affecting intention to purchase green product in vietnam. J Asian Finance, Eco Bus, 205–211.

Danciu V (2012) The green marketing at work: the push-pull effects of the green communication strategies. Romanian Econo J, 15(45):3–24.

de Medeiros JF, Ribeiro JLD, Cortimiglia MN (2016) Influence of perceived value on purchasing decisions of green products in Brazil. J Clean Prod 110:158–169

D'Souza C, Taghian M, Lamb P, Peretiatkos R (2006) Green products and corporate strategy: An empirical investigation. Soc Bus Rev 1(2):144–157

Higuera-Castillo E, Kalinic Z, & Marinkovic V (2020) A mixed analysis of perception of electric and hybrid vehicles. Energy Policy, 136.

Jaideep S (2022, June 3) Your Article. Retrieved from Yourarticlelibrary: https://www.yourarticlelibrary.com/marketing/green-marketing-meaning-and-importance-of-green-marketing/48587

Janssen MA, Jager W (2002) Stimulating diffusion of green products. J Evol Econ 12(3):283–306

Kenzie M. (2005) Measuring inequality with asset indicators. J Popul Econ, 229–260.

Lakshmanan R (2012) An overview of green marketing. Research Gate, 1–11.

Lin PC, Huang YH (2012) The influence factors on choice behavior regarding green products based on the theory of consumption values. J Clean Prod 22(1):11–18

Maniatis P (2016) Investigating factors influencing consumer decision-making while choosing green products. J Clean Prod 132:215–228

Mazar N, Zhong CB (2010) Do green products make us better people? Psychol Sci 21(4):494–498

Milfont T, Duckitt J, & Wagner C (2010) A cross cultural test of the value-attitude-behavior hierarchy. J Appl Soc Psychol, 2791–2831.

Moruzzi R, Sirieix L, Rama D (2013) Les Consommateurs face aux paradoxes de l'offre produits alimentaires durables. Universita Cattolica, Sede di Piacenze

Mostafa (2006) Antecedents of Egyptian consumers' green purchase intentions. J Int Consum Mark, 97–126.

Naimi A, Kanapathy & Aziz (2021) Exploring consumers participation in environment management: Findings from two staged structural equation modelling-artificial neural network approach. Corporate social responsibility and environmental management, 184–195.

Nuttavuthisit K, Thøgersen J (2017) The importance of consumer trust for the emergence of a market for green products: The case of organic food. J Bus Ethics 140(2):323–337

Ottman (1995) Environmental marketing management. Meeting the green challenge, 55–70.

Panda TK, Kumar A, Jakhar S, Luthra S, Garza-Reyes JA, Kazancoglu I, & Nayak SS (2020) Social and environmental sustainability model on consumers' altruism, green purchase intention, green brand loyalty and evangelism. J Clean Prod, 243.

Peattie K (1999) Trappings versus substance in the greening of marketing planning. J Strateg Mark, 131–148.

Polonsky MJ (1994) An introduction to green marketing. Electron Green J, 61(49):216–911.

Primer HR (2020, May 23) Theory of Planned Behaviour. Health Communication Capacity Collaborative, p. 2.

Pujar, W, & Peattie (2002) Green and Competitive: Influence on Environment new product development (ENPD) Performance. J Bus Res, 120–133.

Ritter ÁM, Borchardt M, Vaccaro GL, Pereira GM, Almeida F (2015) Motivations for promoting the consumption of green products in an emerging country: Exploring attitudes of Brazilian consumers. J Clean Prod 106:507–520

Schwartz (1977) Normative influences on altruism. Advance in experimental social psychology, 221–279.

Tseng SC, Hung SW (2013) A framework identifying the gaps between customers' expectations and their perceptions in green products. J Clean Prod 59:174–184

Yadav R, Pathak GS (2016) Young consumers' intention towards buying green products in a developing nation: Extending the theory of planned behavior. J Clean Prod 135:732–739

Westley F, Vredenburg H (1991) Strategic bridging: The collaboration between environmentalists and business in the marketing of green products. J Appl Behav Sci 27(1):65–90

Mr. Ahmed Mahdi Abdulkareem is assistant Llecturer at Al-Kunooze University College, Basra, Iraq. He published many papers in different journals. He is a reviewer in several journals. He is a doctoral student in the Department of Commerce and Business Administration, Saurashtra University, Rajkot, Gujarat—360005, India.

Dr. AlokKumar Chakrawal is a professor at the Department of Commerce and Business Administration, Saurashtra University, Rajkot, Gujarat – 360005, India.

Artificial Neural Network and Structural Equation Modeling Techniques: Sustainability of Marketing

Social Responsibility in Marketing

Yuvaraj Ganesan, Abdullah Mohammed Sadaa,
Alyaa Abdulhussein Kareem, Ahmed Mohammad Aldegis,
and Mohammed Alawi Al-Sakkaf

1 Introduction

While marketing has historically focused on the client, the unintended repercussions of marketing operations necessitate taking into account important stakeholders and their relevant interests (Jahdi and Acikdilli 2009). The literature on marketing advocates focusing on consumers and developing greater answers to their demands (Quezado et al. 2022; Yim et al. 2019). Market orientation has now been highlighted as an important aspect in the successful implementation of marketing strategy (Sheikh et al. 2019). However, fulfilling the wants and aspirations of all stakeholders has not always been connected with a successful marketing plan (Maignan et al. 2005). Regrettably, most strategic marketing approaches put the interests of one stakeholder, the customer, ahead of the interests of others (Turpin and Shier 2020). There is a growing recognition that firms must prioritise its customers and important stakeholders involved who hold the firm accountable for actions. The current growing reason for marketing is that it exists to offer both economic and social processes, as well as a network of contacts to provide skills and information to every stakeholders (Vargo 2004). This logic is reflected in the American Marketing Association's (2004) redefinition, which also asserts that marketing is an essential part of an organisation and a set of procedures for constructing, interacting with, and attempting to deliver value to customers, as well as handling customers, communicating with, and supplying value to the organisation and its stakeholders (Gundlach 2007).

This concept highlights the necessity of providing value and marketers' responsibilities to build meaningful connections that benefit all relevant stakeholders. This is

Y. Ganesan · A. M. Sadaa (✉) · A. M. Aldegis · M. A. Al-Sakkaf
Graduate School of Business, Universiti Sains Malaysia, Penang, Malaysia
e-mail: abdalluhmohammed1995@gmail.com; abdullah1995@student.usm.my

A. A. Kareem
School of Industrial Technology, Universiti Sains Malaysia, Penang, Malaysia

the first marketing definition to incorporate "concern for stakeholders" (Moliner et al. 2020). Because of the complexities involved in determining the impacts of a successful business owner on all relevant stakeholders, interested parties in the exchange process must be identified (Khaw et al. 2022). A long-term, multi-stakeholder approach to marketing reconceptualisation has also been proposed as a prescriptive paradigm for organisational responsibility in marketing (Gabler et al. 2021). According to studies, strategic planning differs significantly depending on the stakeholder profiles of firms. Some businesses have discovered that they focus on a certain stakeholder group, such as consumers, shareholders, workers, or rivals (Greenley et al. 2005). Marketing must establish a stakeholder focus rather than a restricted consumer orientation based on such developments. Marketing stakeholder orientation goes above markets, competitors, and channel partners to understand and meet all stakeholder expectations (Granville et al. 2016). As a consequence, businesses are increasingly under pressure to demonstrate initiatives that take a balanced approach to various stakeholders. Despite the fact that some leading corporations, such as Shell, Beyond Petroleum, and Starbucks, have launched inventive corporate social responsibility (CSR) projects, many others have failed to implement a strong CSR programme that genuinely incorporates and balances his\her obligations to different stakeholders (Glaveli 2020). Alternatively, most businesses tend to implement uncoordinated activities that address certain stakeholder needs, such as green marketing, policies against child labour, and equal opportunity programmes. Both are crucial in marketing; corporate brand and reputation are formed via corporate activities and interactions with stakeholders (Balmer and Greyser 2006; Maignan et al. 2005). Without the execution of meaningful interactions with stakeholders, the significance of corporate identity would dwindle with time (Topalian 2003).

Surprisingly, academic and management literature has offered little assistance to assist marketers in integrating multiple activities into a solid programme that can fulfil a broad range of company duties (Glaveli 2020; Öberseder et al. 2014). For example, it has been proposed that addressing customer requirements and motivating employees to serve consumers might boost shareholder value and help fulfil stakeholders' interests (George 2003). One technique for improving socially aware marketing has been proposed: promote customer well-being while posing no threat to other parties (Lin et al. 2019); most of the study on CSR has been on its conception (Othman and Hafez 2019; Pfajfar et al. 2022). Most recent studies have concentrated on applying only a few areas of CSR (Ibrahim et al. 2021). Little has been published regarding CSR's tangible and methodical implementation in organisations (Smith 2003) and the potential advantages (Maignan and Ferrell 2004). As a consequence of the preceding debate, this chapter seeks to clarify the function of CSR as one of the potential marketing tactics (Othman and Hafez 2019).

2   Marketing Definition

Marketing is maintaining a company's current clientele satisfied while also acquiring new ones. It is the collection of actions and procedures used to create, communicate, deliver, and exchange value offerings to consumers, clients, partners, and society (Othman and Hafez (2019). Marketing, according to Vaaland et al. (2008), is the act of preparing and implementing out the production, pricing, promotion, and transmission of commodities, ideas, and services in order to generate exchanges that fulfil individual and organisational goals. Marketing, according to Gabler et al. (2021), is an integral part of the organisation and a set of techniques for producing, disseminating, and giving value to customers while also communicating and delivering value to the firm and its stakeholders. Marketing is thus a mindset that places the consumer at the centre of all corporate actions (Liébana-Cabanillas et al. 2021). Marketing is significantly wider than selling since it is a specialised activity aimed at exceeding the expectations of clients (Nowak and Newton 2008). Simply said, marketing is concerned with consumer happiness and the fulfilment of needs and desires. Marketing should create a win scenario by providing a product that matches customers' demands while creating healthy earnings for the firm.

As a result, good marketing meets both goals: customer satisfaction and profit generation (Lee et al. 2020). The American Marketing Association defines marketing as "the activity, collection of institutions, and procedures for producing, communicating, providing, and exchanging items with value for consumers, clients, collaborators, and society at large" (Pfajfar et al. 2022). Marketing is critical to the success of any organisation. Customers must be identified and acknowledged as the focal point for all company activity. Understanding and meeting their requirements and desires should be the starting point for all major business decisions (Bibb and Kourdi 2004). The Chartered Institute of Marketing (CIM) described marketing as the management activity of discovering, predicting, and economically meeting client expectations (Anna & Irina, 2020).

From 1935 until the present, various marketing definitions have been proposed. The definition proposed by the National Association of Marketing Teachers in August 2004 for this study is that marketing as the process and a set of procedures for producing, engaging with, and attempting to offer value to customers, as well as handling customer communicating and delivering value to the organisation and its stakeholders (Gundlach 2007). In numerous aspects, this term implies a change in a marketing perspective. The concept denotes a shift from a transaction focus to a focus on value for the consumer, implying a focus on the result rather than exchange. The definition is also much more concentrated in that it focuses on the customer and emphasises that marketing ought to be a client rather than a brand/product or any other factors of the marketing mix. Furthermore, the introduction of stakeholders implies a transition from a dyadic (i.e. organisation and person) to a triadic (i.e. organisation, customers, and other stakeholders) approach (Vaaland et al. 2008).

3   Corporate Social Responsibility (CSR), Definition and Background

Corporate social responsibility has moved from the traditional "profit-centred approach" to the current "socially responsible model" (Han and Lee 2021). According to the traditional model, the primary responsibility of managers and executives is to work in the shareholders' best interests, who are the true owners of the company (Ofori and Hinson 2007; Twum et al. 2022). According to the traditional paradigm, corporate spending on social activities violates management's commitment to shareholders, at least to the extent that it does not improve shareholder value. Alternatively, as per the socially responsible framework espoused by (Ahmed et al. 2021; Bocean et al. 2018), a firm's leadership is responsible for maintaining an equitable and working balancing act between the claims of various direct stakeholder groups such as stockholders, workers, clients, and others. Stakeholder theory has been one of the most often used theories to explain corporate social responsibility. Ullmann (1985) developed a framework for predicting corporate social activities founded on the stakeholder theory for strategy design. Roberts (1996) put this theory into practice by experimentally testing the influence of overall business strategy on socially responsible disclosure as a form of corporate social responsibility participation. Despite an accepted definition of a stakeholder as "any person or group who can influence or is influenced by the success of corporate objectives" (Freeman 1984), there seem to be various stakeholder organisations with varying and sometimes contradictory expectations that must be encountered by a focal organisation (Fernando and Lawrence 2014).

In the literature, indeed, there is a disagreement between corporate social responsibility definition interpretation (Moliner et al. 2020). Since its inception in the 1950s, the philosophical perspective on CSR has developed (Carroll 2015; Pratihari and Uzma 2018). Today, CSR is generally defined as a company's role in society, considering all moral commitments that maximise positive influence and limit the negative impact on its surroundings (Glaveli 2020; Maignan and Ferrell 2001). Corporate social responsibility, as defined by Maignan and Ferrell (2004), is a social obligation that incorporates an organisation's requirement to be creative and sustainable to society. It is dedicated to adhering to society's laws, practises, and ideals. El Akremi et al. (2018) recently defined corporate social responsibility as an organisation's context-specific actions and policies that aim to promote stakeholder well-being by accounting for the triple bottom line of economic, social, and environmental repercussions. CSR is thus associated with ethical corporate behaviour, which must permeate all of the organisation's business choices and operations, not only the current economic condition, social, and environmental actions. Intellectuals have sought to categorise corporate social responsibility activities or behaviour on this premise; some authors do so in stakeholder definitions (Cheng et al. 2021; Ji and Miao 2020; Oduro and Haylemariam 2019; Sadaa et al. 2020), while others focus on CSR initiatives (Dumitrescu et al. 2019; Pratihari and Uzma 2018). According to Akremi et al. (2018), a company should be interested in all the groups or persons who

may be touched, direct or indirect, by the pursuit of its aims. The stakeholders are the primary goals of corporate social responsibility, which is defined as the collection of environmental, social, and economic actions undertaken by the corporation to meet its commitments to these groups (Carroll 2015; El Akremi et al. 2018).

Examining the many CSR definitions, we emphasise the following: first, business advantage; secondly, stakeholders; third, care for responsible and irresponsible activities; and fourth, ethical, environmental, and social problems. We suggest the following definition based on these definitions: CSR is the management of widely regarded as for managing responsible and unethical actions associated with environmental, economic, and social concerns in a way that benefits the company.

4 Types of Corporate Social Responsibility

Because the idea of CSR is wide and perspectives differ depending on the experts engaged, defining CSR as a distinct term narrows the scope of study and makes mapping the managerial implications harder. Thus, evaluating and assessing various CSR activities is the first step towards offering significant consequences.

Carroll (1979) distinguished four categories of CSR: economic responsibility, legal duty, ethical duty, and discretionary responsibility:

A. Financial sustainability refers to creating jobs, fair compensation for employees, and developing new goods and services to provide investment returns to corporate investors. The corporation is the economic structure that exists in society from this perspective.
B. Legal responsibility refers to corporate actions that adhere to the law and norms, and society expects corporations to perform economic commitments imposed by the society within legal constraints.
C. Ethical responsibility includes businesses that go above and beyond the law to accomplish what is moral, equitable, and right. Members of society expect social obligations to be behaviours that do not cause harm to society and avoid social harm.
D. Discretionary responsibility entails independent judgement and a variety of options, and it relates to opting to engage in particular activities or make philanthropic contributions to society.

Furthermore, Chang and Lee (2020), Cheng et al. (2021), and Homburg et al. (2013) attempted to categorise CSR in two forms focusing on stakeholder theory. The first kind, "Business Strategy CSR", refers to CSR activities aimed at stakeholders as a result of direct interactions with firms inside corporate business management. Stakeholders that have a close relationship with organisations have the most impact on delivering results, and firms cannot function without their ongoing engagement (Maignan et al. 2005; Phang et al. 2009). "Business Practice CSR" is comparable to Carroll's suggested ethical obligation. It is the form of CSR action that reflects

responsibility to society in corporate management ethically. This is essential for business partner organisations looking for a signal of dependability (Gonçalves Curty and Zhang 2013; Han and Lee 2021). The second category, "Philanthropic CSR", has an indirect association with corporations and refers to corporate philanthropic efforts that attract stakeholders who are not participating in the firms' enterprises. It specifically refers to activities carried out for charitable relationships with communities (Homburg et al. 2013; Twum et al. 2022). Although these stakeholders do not have a direct trading relationship with businesses, they either impact or are affected by them. Corporate social responsibility philanthropic corporate charity directorate-general is similar to the philanthropic accountability notion outlined by Carroll (1991) in that they are seen as voluntary good actions and welfare for society (Godfrey et al. 2009) and gain emotional value from the participants (Homburg et al. 2013).

5   Corporate Social Responsibility in Marketing

The changing dynamics of communication and marketing demand a new intellectual approach to be recognised and pursued by marketing academics with the onset of digitalisation and globalisation in the twentieth century (Öberseder et al. 2014). To reap the benefits of the global economy and daily advances in innovation and technology, marketers must build a new flexible and imaginative vision of the pillars and key components of marketing (Faulkner and Vikulov 2001; Lăzăroiu et al. 2020). Narrow client understandings and narrow delineations of what defines market share are being questioned, both internationally and regionally in Africa. With the increasing popularity of social media and electronic commerce, internet marketing must adapt to satisfy the expectations of the extra involved client. Consumers are becoming more aware of issues such as global warming, the highest standards of ethics, and corporate social responsibility. With this perspective, it is necessary to go far beyond conventional kinds of marketing, such as precise information and personalisation, that have long served as the core of marketing operations (Luger et al. 2022; Ofori and Hinson 2007; Wang et al. 2020). Marketers have been driven to include more stakeholders and consumer involvement strategies in their marketing strategy due to online marketing and web platforms. Consumers and the public at large are more engaged when a firm is demonstrated to be an active participant in society, and the social benefits that it provides to the areas in which its works are promoted (Abdullah et al. 2022; Muhammad et al. 2021; Pfajfar et al. 2022). However, there is some hesitation to use such implemented CSR projects and events to benefit the organisation's broader business model, such as employment of these activities in marketing (Chakraborty and Jha 2019; Moliner et al. 2020). One of the goals of this chapter was to clarify the relationship between marketing and CSR to highlight the relevance of this link and create knowledge of relevant effective implementation strategies.

Social marketing originated as the first step towards investigating the benefits of corporate social responsibility to organisation marketing (Ng 2022), and it shifted the organisation's degree of concern away from products and services and more

towards society. Some studies define corporate social responsibility as a brand image by situating this in a global context that includes social things causing marketing, green marketing, consumer reactions to companies' socially responsible activities (Maignan and Ferrell 2004), and also social marketing, life quality, socially aware purchases, and economic sustainability (Vaaland et al. 2008). Intriguingly, the general thrust of marketing into environmental sustainability in the 1990s emphasised the importance of individual accountability for and providing for the betterment of society (Ng 2022), implying that organisational marketing is required to prioritise commitment to the benefit of society as a whole. Researchers have discovered a change in the relationship between corporate social responsibility and marketing. The evolution of marketing definitions shows how the concept has already been challenged by bigger dynamics related to environmental challenges and the way society as a whole is now participating in CSR (Sanclemente-Téllez 2017). American Marketing Association (AMA) scholars seek to include the consequences of environmental and management decisions into marketing concepts. In 2004, the AMA defined marketing to emphasise its impact on all stakeholders, not just consumers (Gundlach 2007), a significant shift from over seven decades of definitions that exclusively focused on customers (Chakraborty and Jha 2019). Three years later, additional researchers began to investigate marketing's overall influence on society, and marketing started to be viewed as highly worried about the impact of enterprises on the ecology and conversely (Sanclemente-Téllez 2017).

Deliberations began on how CSR might help marketing. It was stated in some circumstances that CSR may have positive activities on businesses, purchasing intentions, attitudes about a company, and brand loyalty. Scholars connected CSR to positive consumer perceptions of corporations because stakeholder-driven, personality-driven, and strategic objective attributions showed little or no effect (Öberseder et al. 2014). If a company fails to meet its expectations, CSR can backfire by raising scepticism, negative word-of-mouth, or avoidance (Sanclemente-Téllez 2017). The preceding situations highlighted how CSR profiles might affect a company's perception in the eyes of customers, which is a primary marketing goal.

When academics highlighted that both are related through overall value, the importance of CSR in marketing became obvious (Becker-Olsen et al. 2011). The primary goal of marketing is to maximise stakeholder value, including earnings and lengthy relations with stakeholders the (Moliner et al. 2020). Meanwhile, CSR fosters strong customer relationships, improves corporate reputation, boosts brand value, builds distributor linkages throughout the supply chain, and fosters employee loyalty while protecting the environment (Quintana-García 2021; Tariq et al. 2021). As a result, marketing seems to be about a company's commitment to delivering something that does not include revenues. Integrating corporate social responsibility as a business model exemplifies the value that a company can provide, and it is at this point that corporate social responsibility is included in value assessments.

On the other hand, where do marketing and CSR intertwine? Since both foci on the connection between the company (organisation) and society, it's been claimed that marketing must take the lead in CSR research (Chakraborty and Jha 2019; Ibrahim et al. 2021). Several marketing principles intersect with various areas of

CSR. Social marketing (Čerkasov et al. 2017), cause-related marketing (e.g. Wang et al. 2020), enviro marketing (e.g. Vaaland et al. 2008), green marketing (Grasso et al. 2015), quality of life QOL (Malaquias and Hwang 2016), socially conscious buying (Moliner et al. 2020), and sustainable consumption are examples of these concepts (Guo et al. 2022; Sun and Li 2021). Several marketers say that a stakeholder-oriented approach, rather than a narrow consumer approach, is essential, with a focus on demands from actors other than customers and channel members (Maignan and Ferrell 2004). This emphasis extends beyond markets, competitors, and channel partners in order to understand and exceed all expectations. This point of view is compatible with the American Marketing Association's new definition of marketing dated 2004, which expressly states the purpose of creating value and maintaining customer connections to benefit the organisation and its stakeholders (Maignan et al. 2005). The most effective technique for increasing socially responsible marketing is to promote customer well-being while minimising harm to other stakeholders (Vaaland et al. 2008). The stakeholder duty means that the firm's "social commitment" is confined to those impacted or affected by the firm's actions (Maignan and Ferrell 2004). Although it is acknowledged that the corporation has a societal duty, this view implies that an individual business would be only accountable to the stakeholders with whom it interacts (Freeman 1984). Following Freeman's adoption of stakeholder theory, marketing researchers extended the firm's specific scope on shareholders to a larger collection of stakeholders. Maignan and Ferrell (2004) classified various business stakeholders and found that using CSR as a marketing stimulus will broaden the institution's reach to many stakeholders. Employees, strategic partners, and other important stakeholders of the company are motivated, resulting in a better consumer experience. The literature generally accepts the definition of CSR as a commitment to numerous stakeholders (Ibrahim et al. 2021; Khaw et al. 2022; Pfajfar et al. 2022). CSR as a technique for influencing many stakeholders affiliated with a firm is increasingly a significant subject in marketing (Chakraborty and Jha 2019). Wagner et al. (2009) established environmental responsibilities as an inherent aspect of a company's CSRs in the marketing literature, drawing on Marrewijk's (2003) approach. According to Wagner et al. (2009) "the business's socio-environmental duty is to exert good influence while minimising detrimental effect", and "perceived dishonesty of the company reducing the lousy impact consumers' sentiments about the firm". According to Nikolaeva and Bicho (2011), stating social economic responsibility is as important as financial disclosures and boosts the firm's reputation.

6   CSR Implements in Marketing

Maignan et al. (2005) developed an integrated model of the stages to be performed to correctly implement corporate social responsibility from a marketing standpoint, allowing marketing decisions to be made in line with company values and standards, as shown below:

The first step is to identify corporate values and standards: To promote organisational fit, a CSR programme must align with the organisation's goals, norms, and mission. This first stage seeks to discover company principles and ideals that may have CSR implications. Current values and norms that are relevant identify the stakeholders involved and stakeholder issues that the organisation regards to be the most important. Corporate papers such as the stated mission, financial statements, sales brochures, or website frequently contain significant company values and standards (Gonçalves Curty and Zhang 2013). Furthermore, formal papers may not be adequate to elicit how the company perceives its relations with stakeholders and their contributions. Interviews with key and senior organisational members may give useful insights to kick-start the management process. Businesses must evaluate which business practices and consequences are most important to its stakeholders while also explaining their interests and positions on topics. While there has been a minimal emphasis on constructing policy alternatives based on stakeholder desires, Gregory and Keeney (1994) offer proposed tools for doing so. They present a reasonable methodological framework for directing stakeholder decision-making. To begin, each stakeholder based on faulty objectives based on a shared understanding of the decision environment. Stakeholders then choose options that include a list of goals, with the premise that goals should be linked to values. Then, via discussions, a balanced prototype is produced from the interests of opposing factions (Gundlach 2007). Marketing, for example, has typically targeted consumer stakeholders; a new logic, however, is developing in which the optimum unit of trade is the application of competencies, knowledge, and skills for the benefit of all stakeholders (Vargo 2004). Companies implementing an integrative orientation must develop insight by identifying and understanding stakeholders' requirements. The first step in identifying stakeholders involved interested in organisational involvement and solutions is identifying CSR concerns and challenges.

The second step is Stakeholder Identification: It is critical to identify stakeholder requirements, wants, and wishes when managing this stage. Many critical topics acquire attention when major constituencies, including consumer organisations, policymakers, or even the media, express an interest (Lin et al. 2017). A decision-making process is necessary when there is an agreement, collaboration, or even disagreement on an issue. Woodside and Baxter (2015) offer a collaborative approach to issue resolution in order to overcome adversarial tactics. Managers can determine stakeholders who may be affected or influenced by organisational policy development. There will be competing requirements (Altman and Petkus 1994):

1. Consultation, accommodation, and participation.
2. Alternatives formulation.
3. Leadership and communication.
4. Policy development that is evaluated and altered.

As previously stated, communication with stakeholders and salience are dependent on stakeholders possessing several of the following features: power, validity, and immediacy (Lo et al. 2022; Yusuf et al. 2018). Stakeholders wield influence over a company because they can withhold or withhold money and organisational resources

(Maignan and Ferrell 2004). To evaluate the strength of a certain stakeholder community, consider how much:

1. The company relies on the assets of these stakeholders for continuous life, and
2. The welfare of the stakeholders is dependent on organisational performance (Frooman 1999).

Customers have the most influence when their existence is unaffected by the organisation's performance, and they also have access to vital organisational resources. Most shoe customers, for example, do not require Nike sneakers. As a consequence, if consumers avoid Nike, they will only encounter minor issues. Nonetheless, their loyalty to Nike is vital to the company's long-term success.

The third step to determine stakeholder concerns: Steps 1 and 2 together contribute to discovering the stakeholders who are both powerful and genuine. The degree of urgency in meeting their requirements is determined by their level of authority and legitimacy (Homburg et al. 2013). The third phase is to identify the main issues that all these stakeholders are worried about. When problems are complicated enough that many parties must handle them, the inadequacies of adversarial tactics are recognised (Öberseder et al. 2014; Sadaa et al. 2022). The majority of this information is typically throughout, but it's not been thoroughly incorporated and tested. Salespeople, customer service representatives, purchasing managers, public relations and advertising experts, for example, may be well-versed in the core standards and concerns shared by consumers, providers, as well as the public at large (Hu et al. 2019). Secondary papers issued by stakeholder groups such as professional organisations, government entities, non-governmental organisations (NGOs), or rivals may also include relevant information. Despite this existing information, roundtable discussions or interviews with stakeholders may be beneficial in better understanding their expectations. These forums might address the following issues (Maignan et al. 2005):

A. Stakeholder perspectives on CSR overall: What is CSR? Who is the most accountable in business? What are some instances of socially responsible businesses? Here are some other instances of socially irresponsible businesses?
B. Stakeholders' perspectives on the focus institution's social responsibilities: to whom is this corporation accountable? What are the firm's negative effects on society and its professional colleagues?

Step 3 should result in a clear stakeholder management plan and their challenges, as well as a strategy and business model. General Motors follows a similar method, with "community outreach strategy teams" in charge of detecting internal and external concerns that may hurt the firm and its stakeholders. An honest depiction of comparative levels of authority may assist stakeholders in accepting their roles and responsibilities, as well as top management in adopting an integrative attitude (Monfardini et al. 2013).

The fourth step is evaluating the significance of corporate social responsibility: Steps 1–3 entail communicating information on corporate social responsibility to a diverse variety of influencers both within and outside the company. Step

4 integrates the previous three stages to arrive at a unique idea of corporate social responsibility for the firm of interest. This broad concept will then be used to evaluate current practices and choose particular CSR projects (Oduro and Haylemariam 2019). This phrase should be used to describe functional domains such as marketing for corporate social responsibility initiatives that address stakeholder concerns. This chosen definition should be defined in official documents such as financial statements, websites, and corporation brochures. At the very least, the description should clarify two crucial facts (Maignan et al. 2005):

1. The driving force behind the dedication to CSR.
2. The stakeholders and topics are deemed important by the organisation.

The first part of the definition outlines why corporate social responsibility is vital to the company and places corporate social responsibility within the larger business aims and purpose framework. When there is a corporate social responsibility issue and a requirement for a solution, the focus shifts to investigating solutions with stakeholders such as consumer groups, trade organisations, regulatory authorities, and others to build a CSR concept and policy (Van De Ven 2008). The second component of the CSR definitions identifies the stakeholders and situations that will be the primary focus of CSR activities. Voluntary partnerships are formed due to corporate pledges in their goals and principles to engage in initiatives that result in enhanced CSR (Becker-Olsen et al. 2011). ABN AMRO, for example, describes its social responsibility as follows:

It is vitally essential to us, both ethically and financially, to be an active and responsible part of the communities and general public. They believe that being a good corporate citizen benefits all stakeholders, including workers, clients, consumers, municipalities, and others, whether we are designing new products to assist sustainable development, articulating our company views, or sponsoring athletics and the arts (Maignan et al. 2005).

The fifth step is to audit existing processes: To demonstrate a firm's commitment to corporate social responsibility, social audits must be used to discover stakeholder complaints. Social auditing seems to be the practice of reviewing and reporting company performance as well as satisfying stakeholders' social duties (Chakraborty and Jha 2019; Sousa-Filho et al. 2020). A corporation has no tangible means to validate the value of social objectives, relate them to organisational success, or explain expenditures to stakeholders absent credible assessments of their achievement (Othman and Hafez 2019). The social audit should provide regular, detailed, and comparative validation of stakeholder feedback, particularly on critical issues and concerns. A review of existing corporate social responsibility initiatives might be guided by two basic questions:

a. What existing mechanisms does the organisation have to handle critical relevant stakeholders?
b. Which procedures should be improved?

The first component of this assessment is required since most firms lack a thorough understanding of the numerous procedures already in place to address each

stakeholder concern. Managers, for example, may evaluate a wide variety of efforts when examining the issue of customer interactions, such as customers' expectations, contractual employee performance, and consumers' views regarding the social and environmental impact associated with the purchase of products. As a result, marketing must address long-term connections rather than relying on technology to manage immediate client behaviour (Vargo 2004). The second step of the audit is to assess which organisational practices need to be altered in order to better address stakeholder complaints. A comprehensive review of all organisational processes, as well as surveys of various stakeholders, may be carried out to conduct the second part of this audit. Objective metrics of an organisation's effect on specific stakeholder issues can also be used (Pfajfar et al. 2022). Businesses may rely on standardised audits, like those given by the Global Reporting Initiative and the Social Accountability Institute. These criteria give a list of issues to be addressed as well as potential indicators of effect (Oduro and Haylemariam 2019).

The sixth step is carrying out CSR projects: The Adopting CSR process begins with prioritising the difficult areas identified in step 5. There are two primary criteria to examine (Ng 2022). First, various measures' financial and organisational investments must be examined. One might distinguish between the problems that necessitate (Maignan et al. 2005):

a. Only minor modifications to existing procedures. Philanthropic gifts, for example, may be reorganised to target one corporate strategy concern methodically. Similarly, staff communications may be condensed to improve accessibility and clarity. Reduced cycle time might increase service quality.
b. Development of novel external marketing methods. Developing a supplier evaluation programme that focuses on ecological variables and adopting a strategy to deliver a personalised reaction to every consumer complaint are two examples.
c. The development of new products to enhance green marketing. Businesses, for example, should strive to decrease non-recyclable content in products, develop methods to reuse old packaging, and cut pollution levels far advance of government regulations.

When prioritising corporate social responsibility problems, another aspect to consider is urgency. Whenever a problem is related to a point listed in the corporate social responsibility definition, and stakeholder demands just on issues are anticipated, the challenge may be deemed urgent. As a result, it must be addressed as soon as possible (El Akremi et al. 2018). Once a representation and timeline for CSR problems have been defined, it is critical to assign responsibilities to particular projects and the CSR execution plan as a whole. Although it is sometimes disregarded, hiring an individual or group to oversee all corporate social responsibility initiatives is the only method to ensure the coherence of various programmes and their compliance with the proclaimed concept of corporate social responsibility (Vaaland et al. 2008).

The seventh step is CSR promotion raising awareness: Considering that one aspect of corporate social responsibility is addressing stakeholder concerns, businesses must keep various stakeholders aware of initiatives undertaken to address these issues. Some stakeholders are growing more interested in keeping up with

public relations, notably environmental and social reporting (mainly shareholders, investment funds, business partners, and employees). A rising number of companies appear to be utilising websites to publicise their achievements (Maignan and Ferrell 2001). Traditional advertising may also be used to spread the word about corporate social responsibility initiatives.

For instance, when the firm promotes on display cases and its websites, its employees get thank-you letters and unique recognition for their work time volunteering in the community. These remarks demonstrate that the firm and its employees care about the public in the neighbourhood. Potential recruits, clients, and local residents may be drawn in by the declared affinity and devotion. According to Van De Ven (2008), one technique for building a sense of attachment to the enterprise is to emphasise the concept that the corporation and its shareholders share equivalent attention.

The final step is gathering feedback from stakeholders: The many initiatives outlined in step 7 aid in the stimulation of a conversation with stakeholders. Several methods can be used to elicit more stakeholder feedback. Other tools can keep track of stakeholders' perceptions of the company and its changing difficulties (Chakraborty and Jha 2019).

First, satisfaction or image surveys can provide stakeholders with a general appraisal of the business and its activities. For example, AstraZeneca conducted a global poll of its employees to examine not just their satisfaction but also their perceptions of the firm's socially responsible initiatives. Beyond Petroleum (BP) has done various stakeholder polls to assess their impressions of the company and suggestions for desirable changes (Maignan et al. 2005).

Second, more qualitative approaches may be preferable to measure stakeholders' impressions of the firm's contributions to certain challenges (Frooman 1999). BP, for example, performed a qualitative review of its social responsibility activities and reported on the findings via conversations with institutional investors, individual shareholders, local leaders, and non-governmental organisations (NGOs) (Altman and Petkus 1994). Different methodologies enable the firm's progress in resolving certain stakeholder problems to be assessed. They also suggest areas that need to be improved further. As a consequence, as indicated in Fig. 2, we propose that the comments from stakeholders be used as input over the next audit. As a result, stages 5–8 (from the CSR audit with stakeholder involvement) must be performed on a regular basis. We recommend doing a bi-annual evaluation of current procedures (Maignan et al. 2005).

Figure 1 depicts how stakeholders' feedback may be used to evaluate the first three parts of corporate social responsibility managing projects in the long run (approximately every four years). Stakeholder surveys may reveal a new and distinct stakeholder group or emerging stakeholder issues. As a result, corporate standards and values, as well as the idea of corporate social responsibility, may need to be revised (Maignan and Ferrell 2004).

7   Conclusion

This chapter discussed corporate social responsibility in marketing and how businesses may appropriately adopt CSR from a marketing standpoint. In general, marketing serves as one of the primary contact points between the organisation and its clients. The expression of a firm's acceptance of CSR ideals is frequently through the firm's marketing endeavours. The prism through which the marketing department observes and implements CSR principles impacts the firm's adoption of CSR. Because CSR is such a large and multifaceted subject, its use in marketing is not straightforward. Furthermore, it was discovered that the existing literature is confusing concerning the relationship between CSR and effectiveness, and research in this sector is difficult to compare since different studies have concentrated on different characteristics of CSR. Consequently, the Maignan model stages were used in the study to improve a comprehensive knowledge of the implementation of corporate social responsibility ideas in the context of marketing.
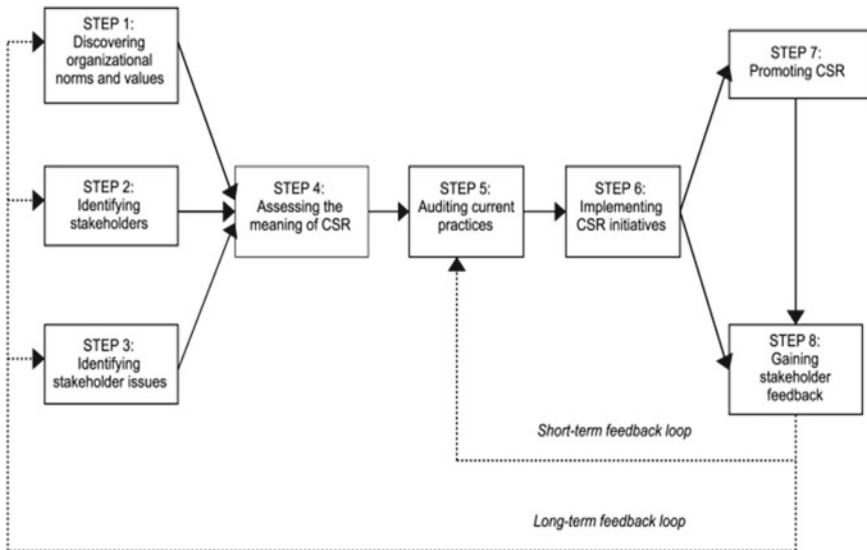

Fig. 1   A step-by-step guide to establishing CSR (*Source* Maignan et al. 2005)

References

Abdullah HO, Thajil KM, Alnoor A, Al-Abrrow H, Khaw KW, XinYing, Sadaa AM (2022) Predicting determinants of use mobile commerce through modelling non-linear. Cent Eur Bus Rev 11:0–24. https://doi.org/10.18267/j.cebr.306

Ahmed MG, Aldhaher AAA, Abdulkdhim BT, Sadaa AM (2021) Sustainable supply chain's effect on competitive performance, a case study in al basrah oil company. Int J Entrepreneurship 25(Special Issue 1):9264.

Altman JA, Petkus E (1994) Toward a stakeholder-based policy process: an application of the social marketing perspective to environmental policy development. Policy Sci 27(1):37–51. https://doi.org/10.1007/BF00999598

Anna N, Irina V (2020) Features of social responsibility of marketing in small and medium-sized businesses in Russia. Revista ESPACIOS 41(25):67–73

Balmer JMT, Greyser SA (2006) Corporate marketing: integrating corporate identity, corporate branding, corporate communications, corporate image and corporate reputation. Eur J Mark 40(7–8):730–741. https://doi.org/10.1108/03090560610669964

Becker-Olsen KL, Taylor CR, Hill RP, Yalcinkaya G (2011) A cross-cultural examination of corporate social responsibility marketing communications in Mexico and the United States: strategies for global brands. J Int Mark 19(2):30–44. https://doi.org/10.1509/jimk.19.2.30

Bibb S, Kourdi J (2004) Building customer trust. Trust Matters 46(4):87–105. https://doi.org/10.1057/9780230508330_7

Bocean CG, Sitnikov C, Tudor S (2018) Theoretical perspectives concerning modeling consumer behavior influences on CSR and marketing roles in shaping consumer perceptions. In: CSR, sustainability, ethics & governance (pp. 45–62). Springer. https://doi.org/10.1007/978-3-319-70449-4_4

Carroll AB (2015) Corporate social responsibility: the centerpiece of competing and complementary frameworks. Organ Dyn 101:e789–e790. https://doi.org/10.1016/j.physio.2015.03.3668

Carroll AB (1979) A three-dimensional conceptual model of corporate performance. Acad Manag Rev 4(4):37–45. https://doi.org/10.5465/amr.1979.4498296

Carroll Archie B (1991) Corporate social performance measurement: a comment on methods for evaluating an elusive construct. In: Post JE, Research in corporate social performance and policy: a research annual, 12(January):385–410.

Čerkasov J, Huml J, Vokačova L, Margarisova K (2017) Consumer's attitudes to corporate social responsibility and green marketing. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis 65(6):1865–1872. https://doi.org/10.11118/actaun201765061865

Chakraborty A, Jha A (2019) Corporate social responsibility in marketing: a review of the state-of-the-art literature. J Soc Mark 9(4):418–446. https://doi.org/10.1108/JSOCM-01-2019-0005

Chang JI, Lee CY (2020) The effect of service innovation on customer behavioral intention in the Taiwanese insurance sector: the role of word of mouth and corporate social responsibility. J Asia Bus Stud 14(3):341–360. https://doi.org/10.1108/JABS-06-2018-0168

Cheng G, Cherian J, Sial MS, Mentel G, Wan P, Álvarez-Otero S, Saleem U (2021) The relationship between csr communication on social media, purchase intention, and e-wom in the banking sector of an emerging economy. J Theor Appl Electron Commer Res 16(4):1025–1041. https://doi.org/10.3390/JTAER16040058

Dumitrescu A, El Hefnawy M, Zakriya M (2019) Golden geese or black sheep: are stakeholders the saviors or saboteurs of financial distress? Financ Res Lett 37(July):101371. https://doi.org/10.1016/j.frl.2019.101371

El Akremi A, Gond JP, Swaen V, De Roeck K, Igalens J (2018) How do employees perceive corporate responsibility? development and validation of a multidimensional corporate stakeholder responsibility scale. J Manag 44(2):619–657. https://doi.org/10.1177/0149206315569311

Faulkner B, Vikulov S (2001) Katherine, washed out one day, back on track the next: a post-mortem of a tourism disaster. Tour Manage 22(4):331–344. https://doi.org/10.1016/S0261-5177(00)00069-8

Fernando S, Lawrence (2014) A theoretical framework for CSR practices legitimacy theory, stakeholder and instituitional theory. J Theoretical Account 10(1):149–178

Freeman RE (1984) Strategic management: a stakeholder approach. Pitman.

Frooman J (1999) Strategies influence. Acad Manag Rev 24(2):191–205

Gabler CB, Landers VM, Richey RG (2021) Benefits and challenges of developing an eco-social orientation: implications for marketing practice. Eur J Mark 55(4):1155–1176. https://doi.org/10.1108/EJM-05-2019-0400

George B (2003) Managing stakeholders vs. responding to shareholders. Strategy & Leadership 31(6):36–40. https://doi.org/10.1108/10878570310505587

Glaveli N (2020) Corporate social responsibility toward stakeholders and customer loyalty: investigating the roles of trust and customer identification with the company. Soc Responsibility J 17(3):367–383. https://doi.org/10.1108/SRJ-07-2019-0257

Godfrey PC, Merrill CB, Hansen JM (2009) The relationship between corporate social responsibility and shareholder value: an empirical test of the risk management hypothesis. Strateg Manag J 30:425–445. https://doi.org/10.1002/smj

Gonçalves Curty R, Zhang P (2013) Website features that gave rise to social commerce: a historical analysis. Electron Commer Res Appl 12(4):260–279. https://doi.org/10.1016/j.elerap.2013.04.001

Granville F, Mehta A, Pike S (2016) Destinations, disasters and public relations: stakeholder engagement in multi-phase disaster management. J Hosp Tour Manag 28:73–79. https://doi.org/10.1016/j.jhtm.2016.02.001

Grasso M, McEnally M, Widdows R (2015) Social responsibility, environmental concern and consumer behavior toward green products. Developments in Marketing Science: Proceedings of the Academy of Marketing Science 109–113. https://doi.org/10.1007/978-3-319-17320-7_27

Greenley GE, Hooley GJ, Rudd JM (2005) Market orientation in a multiple stakeholder orientation context: implications for marketing capabilities and assets. J Bus Res 58(11 SPEC. ISS.):1483–1494. https://doi.org/10.1016/j.jbusres.2004.07.004

Gregory R, Keeney RL (1994) Creating policy alternatives using stakeholder values. Manag Sci 40(8):1035–1048. http://www.jstor.org/stable/2633092

Gundlach GT (2007) The American marketing association's 2004 definition of marketing: perspectives on its implications for scholarship and the role and responsibility of marketing in society. J Public Policy Mark 26(2):243–250. https://doi.org/10.1509/jppm.26.2.243

Guo X, Yao S, Wang Q, Zhao H, Zhao Y, Zeng F, Huo L, Xing H, Jiang Y, Lv Y (2022) The impact of packaging recyclable ability on environment: case and scenario analysis of polypropylene express boxes and corrugated cartons. Sci Total Environ 822:153650. https://doi.org/10.1016/j.scitotenv.2022.153650

Han SL, Lee JW (2021) Does corporate social responsibility matter even in the B2B market?: Effect of B2B CSR on customer trust. Ind Mark Manag 93(November 2019):115–123. https://doi.org/10.1016/j.indmarman.2020.12.008

Homburg C, Stierl M, Bornemann T (2013) Corporate social responsibility in business-to-business markets: how organizational customers account for supplier corporate social responsibility engagement. J Mark 77(6):54–72. https://doi.org/10.1509/jm.12.0089

Hu X, Chen X, Davidson R (2019) Social support, source credibility, social influence, and impulsive purchase behavior in social commerce. Int J Electron Commer 23(3):297–327. https://doi.org/10.1080/10864415.2019.1619905

Ibrahim MM, El Frargy MM, Hussainey K (2021) The impact of corporate social responsibility as a marketing investment on firms' performance: a risk-oriented approach. J Risk Financial Manag 14(11):515. https://doi.org/10.3390/jrfm14110515

Jahdi KS, Acikdilli G (2009) Marketing communications and corporate social responsibility (CSR): marriage of convenience or shotgun wedding? J Bus Ethics 88(1):103–113. https://doi.org/10.1007/s10551-009-0113-1

Ji H, Miao Z (2020) Corporate social responsibility and collaborative innovation: the role of government support. J Clean Prod 260:121028. https://doi.org/10.1016/j.jclepro.2020.121028

Khaw KW, Alnoor A, Al-Abrrow H, Chew XY, Sadaa AM, Abbas S, Khattak ZZ (2022) Modelling and evaluating trust in mobile commerce: A hybrid three stage fuzzy delphi, structural equation modeling, and neural network approach. Int J Hum Comput Interact 00(00):1–17. https://doi.org/10.1080/10447318.2021.2004700

Lăzăroiu G, Neguriţă O, Grecu I, Grecu G, Mitran PC (2020) Consumers' decision-making process on social commerce platforms: online trust, perceived risk, and purchase intentions. Front Psychol 11(May):1–7. https://doi.org/10.3389/fpsyg.2020.00890

Lee VH, Hew JJ, Leong LY, Tan GWH, Ooi KB (2020) Wearable payment: a deep learning-based dual-stage SEM-ANN analysis. Expert Syst Appl 157:113477. https://doi.org/10.1016/j.eswa.2020.113477

Liébana-Cabanillas F, Singh N, Kalinic Z, Carvajal-Trujillo E (2021) Examining the determinants of continuance intention to use and the moderating effect of the gender and age of users of NFC mobile payments: a multi-analytical approach. Inf Technol Manage 22(2):133–161. https://doi.org/10.1007/s10799-021-00328-6

Lin X, Li Y, Wang X (2017) Social commerce research: definition, research themes and the trends. Int J Inf Manage 37(3):190–201. https://doi.org/10.1016/j.ijinfomgt.2016.06.006

Lin X, Wang X, Hajli N (2019) Building e-commerce satisfaction and boosting sales: the role of social commerce trust and its antecedents. Int J Electron Commer 23(3):328–363. https://doi.org/10.1080/10864415.2019.1619907

Lo P-S, Dwivedi YK, Wei-Han Tan G, Ooi K-B, Cheng-Xi Aw E, Metri B (2022) Why do consumers buy impulsively during live streaming? A deep learning-based dual-stage SEM-ANN analysis. J Bus Res 147(April):325–337. https://doi.org/10.1016/j.jbusres.2022.04.013

Luger M, Hofer KM, Floh A (2022) Support for corporate social responsibility among generation Y consumers in advanced versus emerging markets. Int Bus Rev 31(2):101903. https://doi.org/10.1016/j.ibusrev.2021.101903

Maignan I, Ferrell OC (2001) Antecedents and benefits of corporate citizenship: an investigation of French businesses. J Bus Res 51(1):37–51. https://doi.org/10.1016/S0148-2963(99)00042-9

Maignan I, Ferrell OC (2004) Corporate social responsibility and marketing: an integrative framework. J Acad Mark Sci 32(1):3–19. https://doi.org/10.1177/0092070303258971

Maignan I, Ferrell OC, Ferrell L (2005) A stakeholder model for implementing social responsibility in marketing. Eur J Mark 39(9–10):956–977. https://doi.org/10.1108/03090560510610662

Malaquias RF, Hwang Y (2016) An empirical study on trust in mobile banking: a developing country perspective. Comput Hum Behav 54:453–461. https://doi.org/10.1016/j.chb.2015.08.039

Marrewijk MV (2003) Concepts and definitions of CSR and corporate sustainability: between agency and communion. J Bus Ethics 44:95–105

Miller RL, Lewis WF (1991) A stakeholder approach to marketing management using the value exchange models. Eur J Mark 25(8):55–68

Moliner MA, Monferrer Tirado D, Estrada-Guillén M (2020) CSR marketing outcomes and branch managers' perceptions of CSR. Int J Bank Marketing 38(1):63–85. https://doi.org/10.1108/IJBM-11-2018-0307

Monfardini P, Barretta AD, Ruggiero P (2013) In Seeking legitimacy: social reporting in the health-care sector. *Accounting Forum*, Vol. 37, No. 1(March), (pp. 54–66). No longer published by Elsevier.

Muhammad SS, Dey BL, Kamal MM, Syed Alwi SF (2021) Consumer engagement with social media platforms: a study of the influence of attitudinal components on cutting edge technology adaptation behaviour. Comput Hum Behav 121(March):106802. https://doi.org/10.1016/j.chb.2021.106802

Ng M (2022) The impact of corporate social responsibility expectations on purchase intention of social enterprise products. Soc Enterp J. https://doi.org/10.1108/sej-01-2022-0001

Nikolaeva R, Bicho M (2011) The role of institutional and reputational factors in the voluntary adoption of corporate social responsibility reporting standards. J Acad Mark Sci 39(1):136–157. https://doi.org/10.1007/s11747-010-0214-5

Nowak LI, Newton S (2008) Using winery web sites to launch relationships with Millennials. Int J Wine Bus Res 20(1):53–67. https://doi.org/10.1108/17511060810864615

Öberseder M, Schlegelmilch BB, Murphy PE, Gruber V (2014) Consumers' perceptions of corporate social responsibility: scale development and validation. J Bus Ethics 124(1):101–115. https://doi.org/10.1007/s10551-013-1787-y

Oduro S, Haylemariam LG (2019) Market orientation, CSR and financial and marketing performance in manufacturing firms in Ghana and Ethiopia. Sustain Account Manag Policy J 10(3):398–426. https://doi.org/10.1108/SAMPJ-11-2018-0309

Ofori DF, Hinson RE (2007) Corporate social responsibility (CSR) perspectives of leading firms in Ghana. Corp Gov 7(2):178–193. https://doi.org/10.1108/14720700710739813

Othman AAE, Hafez MG (2019) A framework integrating corporate social responsibility for marketing architectural design firms in developing countries. J Eng Des Technol 17(6):1174–1191. https://doi.org/10.1108/JEDT-11-2018-0202

Pfajfar G, Shoham A, Małecka A, Zalaznik M (2022) Value of corporate social responsibility for multiple stakeholders and social impact—Relationship marketing perspective. J Bus Res 143(December 2020):46–61. https://doi.org/10.1016/j.jbusres.2022.01.051

Phang CW, Kankanhalli A, Sabherwal R (2009) Usability and sociability in online communities: a comparative study of knowledge seeking and contribution. J Association Inform Syst 10(10):721–747. https://doi.org/10.17705/1jais.00210

Pratihari SK, Uzma SH (2018) Corporate social identity: an analysis of the Indian banking sector. Int J Bank Mark 36(7):1248–1284. https://doi.org/10.1108/IJBM-03-2017-0046

Quezado TCC, Cavalcante WQF, Fortes N, Ramos RF (2022) Corporate social responsibility and marketing: a bibliometric and visualization analysis of the literature between the years 1994 and 2020. Sustain (Switzerland) 14(3). https://doi.org/10.3390/su14031694

Quintana-García (2021) Does a green supply chain improve corporate reputation? Empirical evidence from European manufacturing sectors. Ind Mark Manag 92:344–353. https://doi.org/10.1016/j.indmarman.2019.12.011

Roberts JA (1996) Green consumers in the 1990s: Profile and implications for advertising. J Bus Res 36(3):217–231. https://doi.org/10.1016/0148-2963(95)00150-6

Sadaa AM, Ganesan Y, Ahmed MG (2020) The effect of earnings quality and bank continuity: the moderating role of ownership structure and CSR. J Sustain Finance Invest 1–21. https://doi.org/10.1080/20430795.2020.1858690

Sadaa AM, Ganesan Y, Yet CE (2022) The influence of board of directors structure on iraqi banks credit risk : conceptual paper. Int J Account Finance Bus 7(39):167–182. https://doi.org/10.55573/IJAFB.073916

Sanclemente-Téllez JC (2017) Marketing and Corporate Social Responsibility (CSR). Moving between broadening the concept of marketing and social factors as a marketing strategy. Spanish J Mark 21:4–25. https://doi.org/10.1016/j.sjme.2017.05.001

Sheikh Z, Yezheng L, Islam T, Hameed Z, Khan IU (2019) Impact of social commerce constructs and social support on social commerce intentions. Inf Technol People 32(1):68–93. https://doi.org/10.1108/ITP-04-2018-0195

Smith NC (2003) Corporate social responsibility: whether or how? Calif Manage Rev 54(4):52–76

Sousa-Filho JM, de, Matos S, da Silva Trajano S, de Souza Lessa B (2020) Determinants of social entrepreneurial intentions in a developing country context. J Bus Venturing Insights 14(April). https://doi.org/10.1016/j.jbvi.2020.e00207

Sun H, Li J (2021) Behavioural choice of governments, enterprises and consumers on recyclable green logistics packaging. Sustain Product Consum 28:459–471. https://doi.org/10.1016/j.spc.2021.06.011

Tariq B, Najam H, Han H, Sadaa, Abdullah M, Abbasi AA, Christopher N, Abbasi GA (2021) Examining mobile financial services in Pakistan: rural and urban perspective with gender as a moderator. In Recent advances in technology acceptance models and theories (pp. 225–245). Springer.

Topalian A (2003) Experienced reality: the development of corporate identity in the digital era. Eur J Mark 37(7/8):1119–1132. https://doi.org/10.1108/03090560310477690

Turpin A, Shier ML (2020) Social entrepreneurial orientation in human service organizations: a scoping review. Hum Serv Organ Manag Leadersh Gov 44(2):144–168. https://doi.org/10.1080/23303131.2019.1700580

Twum KK, Kosiba JP, Abdul-Hamid IK, Hinson R (2022) Does corporate social responsibility enhance political marketing? J Nonprofit Public Sect Mark 34(1):71–101. https://doi.org/10.1080/10495142.2020.1798850

Ullmann AA (1985) Data in search of a theory: a critical examination of the relationships among social performance, social disclosure, and economic performance of U. S. firms. Acad Manag Rev 10(3):540. https://doi.org/10.2307/258135

Vaaland TI, Heide M, Grønhaug K (2008) Corporate social responsibility: Investigating theory and research in the marketing context. Eur J Mark 42(9–10):927–953. https://doi.org/10.1108/03090560810891082

Vargo SL, RFL (2004) Evolving to a new dominant logic for marketing. J Mark 68(2):1–17. https://doi.org/10.1038/physci230194a0

Van De Ven B (2008) An ethical framework for the marketing of corporate social responsibility. J Bus Ethics 82(2):339–352. https://doi.org/10.1007/s10551-008-9890-1

Wagner T, Lutz RJ, Weitz BA (2009) Corporate the threat social hypocrisy : Inconsistent of responsibility overcoming corporate perceptions. J Mark 73(6):77–91

Wang X, Tajvidi M, Lin X, Hajli N (2020) Towards an Ethical and Trustworthy Social Commerce Community for Brand Value Co-creation: A trust-Commitment Perspective. J Bus Ethics 167(1):137–152. https://doi.org/10.1007/s10551-019-04182-z

Woodside AG, Baxter R (2015) Imprinting, honeymooning, or maturing: Testing three theories of how interfirm social bonding impacts suppliers' allocations of resources to business customers. Australas Mark J 23(2):96–106. https://doi.org/10.1016/j.ausmj.2015.04.004

Yim S, Bae YH, Lim H, Kwon JH (2019) The role of marketing capability in linking CSR to corporate financial performance: When CSR gives positive signals to stakeholders. Eur J Mark 53(7):1333–1354. https://doi.org/10.1108/EJM-08-2017-0526

Yusuf AS, Che Hussin AR, Busalim AH (2018) Influence of e-WOM engagement on consumer purchase intention in social commerce. J Serv Mark 32(4):493–504. https://doi.org/10.1108/JSM-01-2017-0031

Sustainability and Social Responsibility in Marketing

Paiman Ahmad, Hussein Khalifa, and Shrinivas Kulkarni

1 Introduction

Social responsibility is a core principle in the marketing sector, for this reason firms and companies need to pay serious attention to the corporate responsibilities that may harm the society, economy, and environment equally or contribute in the development of society, economy, and environment in the long run. According to the idea of social responsibility, corporations should act like decent citizens by balancing their profit-making endeavors with endeavors that help society, whether on a local, national, or international level. The goal of social responsibility in marketing is to draw customers who desire to change the world with their purchases. Many businesses have included socially conscious components into their marketing strategy to benefit the community through useful services and goods (Investopedia 2022). Additionally, a Neilsen (2015) study that polled 30,000 customers in 60 countries revealed that 66% of respondents were willing to pay more for products from firms that showed social responsibility.

Literature concerning corporate social responsibility is rich, this topic is well-addressed, and the challenges and the advantages of CSR are discussed based on the

P. Ahmad (✉)
Department of Law, College of Humanity Sciences, University of Raparin, Ranya, Iraq
e-mail: paiman@uor.edu.krd

International Relations and Diplomacy Department, Faculty of Administrative Sciences and Economics, Tishk International University, Erbil, Iraq

H. Khalifa
Professor at Radio and TV Department, Faculty of Mass Communication, Cairo University, Giza, Egypt

College of Administrative and Financial, Gulf University, Sanad, Kingdom of Bahrain

S. Kulkarni
School of Business and Management, CHRIST (Deemed to Be University), Bangalore, India

circumstances in each case. At this context, CSR is addressed in regard of business as "the economic, legal, ethical and discretionary expectations that society has of organizations" (Archie Carroll 1979). While Moon (2014) concludes CSR as a set of societal expectations and a set of business practices, the practice of corporate organizations defines their CSR in their operations and business practices. In fact, in many communities around the world, people think of firms and companies to provide support align with their business policies and responsibilities.

Yet the legal and economic aspects of CSR are identified as the very basic needs for a business to grow. The three elements of CSR are aligned with the three main principles of sustainable development goals, as both focus on environment, economy, and society needs. Many corporates recently in cooperate CSR in their companies' agenda (Haynes et al. 2013). Moreover, the current prominent areas of focus for CSR are sustainability, sustainable development, environmental management, business ethics, human rights, etc.

While many corporate organizations and firms are late in considering CSR principles, thus their organizational performance is poor. However, the aim of the main dimensions of CSR is to promote long-term environmental viability, facilitate social well-being now and in the future, as well as maintain better living standards (Haynes et al. 2013). Depending on the idea of the role of CSR and full support for social, environmental, and economic concerns, it provides more credit to corporations, as corporations favor self-regulation over government regulations because cheaper, and corporations control the content and the enforcement of the rules. This situation may lead corporations to ignore rules and regulations in favor of operating in their own self-interest and produce negative consequences for society (Coombs and Holladay 2012). Perhaps,companies are the essence of many problems if their interests have conflicted with stakeholders' and society' interests (Bakan 2004; Porter and Kramer 2002). There are various motives and benefits for conducting CSR successfully, balancing the company's interest to those of society and stakeholders to be seen as a viable decision. Thus, the literature and previous studies and stories indicate that CSR is never been pure altruism, as in many businesses self-interest and profit have been the priority for many years. But, in any circumstance and condition, CSR influences a company's value (Polonsky and Jevons 2009). Considering the main communication means and social media for CSR, Morsing and Schultz (2006) indicated three CSR communication strategies that companies should consider: (1) the stakeholder information strategy, (2) the stakeholder response strategy, and (3) the stakeholder involvement strategy. In using social media, the information strategy is essential to direct the information on one-way communication (Goncalves 2013).

For an organization, social responsibility typically refers to making choices and conducting business in a way that benefits society as a whole or lessens its negative effects. Any sector that has an impact on or is important to society can be used to create a positive social impact or lessen a negative one. This may cover topics that have an impact on society, the environment, the economy, and psychology. One of the main responsibilities of business is marketing, which can be done ethically. That is, it can be done in a way that has an impact in any of the categories, either positively or negatively.

Socially responsible activities and corporate accountability go hand in hand. Administrators, executives, shareholders, and stakeholders, for instance, must act ethically and support community-wide campaigns to promote ethical marketing. Customers can tell that a firm is not devoted to social responsibility if it is just putting on an act or "greenwashing," the practice of advertising false ecologically favorable procedures or products. Instead, such actions may eventually be detrimental to the growth of the organization and its brand. Customers frequently could spot gimmicks, catchphrases, or insincere or unsuccessful efforts. In fact, 65% of those who participated in the Cone survey said they would look into a company's stance on a topic to see whether it was being sincere. The concept of social responsibility in marketing holds that corporations and small businesses should do more than just create money; they should also take initiatives or provide funding for initiatives that help society on a small or large scale. Most businesses use their advertising and branding tactics to promote the social initiatives they are participating in. Businesses frequently emphasize their philanthropic contributions and socially responsible initiatives on their websites, and you may learn more about them by reading their annual reports (Investopedia 2022). Social responsibility in marketing promotes an improved corporate image, which can considerably affect profitability and even productivity favorably, even though an initial investment may include allocating earnings to the needy or making charitable donations.

Several illustrations of socially conscious marketing include:

• Safe product design and development—A business can lessen negative effects on health by using safe manufacturing techniques. Additionally, the company may limit its influence on the environment by using production techniques that generate less waste and sustainable resources.

• Treating clients and customers well—This has a beneficial societal effect on the populace. It encourages the characteristics of good mental health linked to joyfulness and positive attitudes.

• Spreading a positive message—Marketers inform the public about the company's operations. The significance of a company's socially responsible actions is reinforced by community awareness.

2 Literature Review

However, CSR is mainly concerned with economic, environmental, and social aspects of a business or cooperation. Thus, Haynes et al. (2013) highlighted that the public interest and the well-being of society within the context of CSR are aligned with the main theme of corporate responsibility theory, while Kotler and Lee (2005) defined CSR as "operating a business which possibly meets the ethical, legal, commercial, and public expectations that society has of a business." Likewise, Shamir (2005) defined CSR as a set of ethical principles of corporate conduct, and the main concept depends on how different corporations define ethical conduct.

Since cooperation has a dual role, while trying to accumulate revenues and high financial returns, at the same increases income inequality, resource depletion,environmental pollution, and human rights violation (Haynes et al. 2013). Moreover, cooperation globally contributes to various social and environmental problems including overfishing, water scarcity, corruption, and deforestations, which all negatively contribute to climate changes and are against the potential targets of SDGs, the Agenda 2030 (Rasche et al. 2017). It is to this aspect that there are global and regional initiatives that created cooperation between the SDGs and the companies to focus on sustainability as a business strategy, such as the case of the UN Global Compact of the United Nations. In this context, the business strategies and policies of the cooperation/companies are supposed to be aligned with the three principal components of sustainable development, for the sake of meeting public expectations for the positive contributions of companies to the society. Since most companies forget about their responsibility while conducting business in a community, considering this the impact of their business is more harmful than the potential impact. The important question is what the social, economic, and environmental responsibilities a business has, and which is the priority in a company's business policies? Another crucial concern is who monitors the conduct of business and who would evaluate if the public expectations were met? These question and concerns are among the few while many more regarding the CSR concerns.

Climate change and environmental pollution have been two most discussed topics in the literature regarding sustainability of business, because climate change affects each aspect of business cooperation in the future (Howard-Grenville et al. 2014). For highlighting this further governments deal with climate at the one hand and with business operations but there is a clear mismatch. The practice of cooperation in conducting business is varied based on the country and region, in which each cooperation has its own business strategy and policies to conduct and sustain its own business. For this, few companies provide a win–win situation since the notion of utilitarianism is not practiced by all companies equally and the welfare of the community is not seriously studied.

With increasing social, environmental, and economic crises, people encounter more challenges, as many people live in extreme poverty, unemployment is high, corruption alarms in some countries, and conflict pushed many countries to stay underdeveloped. Yet, 2030 Agenda focuses on the 169 targets in its 17 goals, while companies can highly contribute to supporting governments and their communities. There are basic elements in a state that influence the right conduct of a business including the legal system, administrative, institutional competitiveness, role of the stakeholders, and business readiness of that country, plus the social, economic, and political aspects.

Over time, CSR studies have changed. The phrase "corporate social responsibility' was first used in 1926 to describe businesses that were delighted to assist the community while reaping the rewards of their labor (Schmeltz 2012). Marketers view this subject as a key resource for implementing marketing strategies and enhancing businesses' performance holistically due to the importance of CSR actions and their consequences on stakeholders. Due to the potential these initiatives might have for

firms, CSR has received favorable evaluation and introduction in the management area. Organizations are progressively attempting to incorporate all practices and activities related to the SR topic, which is why CSR is currently gaining traction. Following the 2008 financial crisis, publicly traded corporations examined reflected on CSR actions and their beneficial impact on the organization (USA 2010). Companies' efforts are viewed as zealous deeds of compassion that are obvious to all persons involved, not only for the group intended to gain from such benefits (Blacconiere 1997).

3 Corporate Social Responsibility in Marketing

Corporate Social Responsibility initiatives are generally conceived strategically as conferring competitive advantage on the firm over industry rivals. In marketing theory, ethics of the firms in conducting business is associated with the reputation and market value, and ethical in investing and meeting the public expectations with ethical performance (Mackenzie and Lewis 1999; Schmidt Albinger and Freeman 2000). The existing literature shows that there are various drivers for CSR in companies, the motivation of the companies in investing in CSR activities.

The meaning of CSR is becoming increasingly hazy. None of the explanations given for CSR—charitable giving, strategic philanthropy, community involvement, or cause-related marketing—does the idea justice. At Prophet, a management consulting firm that specializes in brand and business strategy, we define CSR as conducting business in a way that is ethical and beneficial to all the organization's stakeholders as well as the community in which it works. Environmental, community, employee welfare, financial performance, and corporate governance are the five key facets of CSR. It is important to be committed to protecting the environment when selling items. The marketing literature has expressed support for corporate social responsibility (CSR). Regarding the unit of analysis taken into consideration and the dimensions of corporate social responsibility explored, there is a significant amount of dispersion within the marketing literature. In the 1960s and 1970s, when marketing experts first voiced their concern about corporate social responsibility, they concentrated on the social responsibilities related to the marketing function rather than the firm's wider societal role (Kotler and Levy 1969).

Regardless of the many opinions and debates on CSR, yet there is still a serious issue, which is not settled yet, "addressing what is good for society is not necessarily good for business" (Rahbek and Pedersen 2015). As noted, CSR promotes global benefits for firms and builds company's credibility (Isaksson et al. 2014). The main focuses of CSR have been defined with regard to responsibilities of businesses for doing good for society in 1950s, and ethical obligation of 1960 shifted to mutual benefits for business and stakeholders in 1970, and in 1980s, the issue of institutional environmental concern has come to light (Turker 2018). Likewise, recently, the present focus of CSR is broader in considering social, economic, and environmental aspects into account while companies conduct a business. Furthermore, corporate

responsibilities have responsibilities including duties and obligations of cooperation as social institution.

As noted, CSR is for both the public and private sector institutions, which has been itemized in the United Nations Global Compact Network principal provisions.

Regardless of the above-mentioned points, at the present times, the focus is given to environmental pollutions and exhaustion of natural resources, especially in the developing world. Thus, CSR can be seen at the glance of application of ethical, sustainability, and responsibility principles in everyday activities of the organization (Žukauskas et al. 2018).

Companies use CSR practices as a strategy because they have a beneficial impact on consumers and provide a competitive advantage. For instance, by implementing SR practices, tourism destination brands like Sustainability 2022, 14, 1694 4 of 24 have improved their appeal and increased the likelihood that visitors will return (Rodrigues et al. 2020). According to some experts, CSR plays an important role in establishing a brand and has a significant impact on consumer interactions, brand loyalty, and perceived quality. Companies that consistently engage in socially responsible behavior must also convey these habits to the target market. As a result, there is less chance that these actions will go unnoticed and the organization will not reap the rewards as a result (Ramesh et al. 2019).

CSR is associated with branding and firm reputations; in certain cases, consumers show their dissatisfaction with corporate policy after receiving information on how goods are produced. This behavior hurts brand equity as well as induces a large cost in the form of penalties. Another serious concern is the firm's willingness and readiness in compensating for environmental damaged produced by the firms (McWilliams et al. 2019). In terms of CSR, a consumer's attitude is vital, as consumers express positive attitudes toward products that bring them pleasure and negative attitudes toward products that make them feel bad. Coupled with ethics and behavior, consumer awareness is crucial because nowadays consumers make their decisions of buying based on their satisfaction and the quality of services provided by the companies. However, to a great extent, this social awareness in the developing world is low, but there are civil society groups that focus on CSR and the challenging issues. Considering CSR as an instrument of social and economic development of any society, cooperation, and engagement is a fundamental issue for fully understanding the main proactive CSR practices. While the notion of CSR is just seen as benefit granted to the community by business, thus opponents believe that companies need to get involved in CSR when the company is well established, growing and profitable (Urip 2010).

The issue of ethical marketing and environmental issues in marketing were studied since 1970 and so far, in the context of the Bruntland Commission (1987), in defining sustainability stated: meeting the needs of the present without compromising the ability of future generations to meet their own needs. At present, as serious attention is paid to climate change and using natural resources globally, here the ethic of marketing is crucial to meet the current needs without exhausting the resources. There is evidence on the complex social and economic relationships among things and each person depends on the impersonal forces of buying "demand" and selling "supply" for the satisfaction of their needs (Baker and Saren 2010). Many scholars

highlighted the importance of ethics in marketing and codes of ethics, in which codes of ethics are considered as the beginning of the evaluation of the company's values.

For many corporates, the leadership practice in deploying the CSR principles accurately is vital for the public interest. In line with this, Rahbek and Pedersen (2015) considered the influence of leadership on the practicing CSR; many reasons are counted as wicked problems demand leadership such as issue of child labor and environmental degradation. Yet in the twenty-first century, we still live with these problems with huge uncertainties. Many scholars provide evidence on the obligation of firms in providing CSR, while obligations are economic, legal, ethical, and philanthropic activities (Idowu and Vertigans 2017). In spite of country peculiarities, three-dimensional value creations of profit, people, and planet have become the targets of business activities for many companies. At this context, creating profit is the perquisite for achieving people and planet (Urip 2010), drawing from the concept of creating profit and attaining corporate reputation. So far for many corporations the ethical responsibility is still undefined while legal and economic concerns are well-illustrated for many corporations (Banerjee 2007). Grayson and Hodges (2004) highlighted another crucial aspect of CSR in which many employees have further concerns, not only pay, conditions, level of interest in the work, and opportunities for advancement but also company reputation, how the company affects the environment and society, and the way the company helps or hinders employees in balancing life-work consideration.

Utilitarian theory and the laissez-faire philosophy both focus on "the greatest good of the greatest number." However, reaching to a satisfactory global or regional level of CSR and matching the expectations of the public in any country seem relatively not achieved yet, because there are many companies who oppose CSR or do not contribute. Veil of ignorance as a philosophical concept at this context is fundamental because an action is only considered right if its consequences for everyone affected by the action are greater than those who make it. The relation between business and society is defined by CSR measures; therefore, there are three main dimensions, which is called "Triple P bottom line" known as profit, "People and planet" where all the three dimensions need to meet with profit, social, and economic achievements of the business (Graafland et al. 2004). In line with this, the philanthropic responsibility of the CSR addresses the companies' desire to be seen as a "good citizen" within society (Demmerling 2015).

4 Corporation Efforts in Communicating Their Corporate Social Responsibility Initiatives

Finding the right policies, strategies, and paths to communicate the CSR initiatives is important for corporations to present themselves in their communities and build good ties with stakeholders and community. Concerning this topic, there are two main questions including first how the company communicates with all stakeholders and

the CSR initiatives? And to what extent the citizens are aware and involved in CSR initiatives? Exploring this issue requires knowing about the corporations, firms, and their economic, social, and environmental initiatives for practicing CSR. According to Tench et al. (2014), a main experienced problem is the companies initiate CSR programs and schemes or conduct CSR activities, but they fail to communicate with their stakeholders and to let the public know what they are doing. Therefore, when the CSR is not clearly communicated, then the companies' efforts are lost. Necessarily, in the communication process, the companies need to engage in the information exchange process and pay attention to the results of the CSR communication. For Sandoval (2014), social media system is socially responsible in the sense that media production, distribution, and consumption satisfy general social needs. The idea of serving the social issues is at the heart of profit making as social needs are the factors of investment for corporations, and business gain can be aligned with serving the social needs. Nevertheless, if "doing good" is not enough to create business and social values, then what a company can do for having a successful CSR? Recently, expectations toward corporate responsibility are heightened and consumer expectations are laid on issues like functional product performance or rational product benefits.

A good example of social influence can be taken here is the call for education and awareness regarding children dental health, which was initiated in America for addressing a "silent epidemic" of oral disease, which helped 50 million children and their families by 2010. The company partnered with the Boys and Girls Club of America and local dental schools across the country to provide education, tools, and access to dental services for children in economically disadvantaged locations in the USA. Through the initiative, the company has created a well-known non-profit that generated high awareness among the non-profit members, while the families and community knew the social value of the CSR initiative (Bhattacharya et al. 2011).

According to Adams (2015), a key challenge for communicating the CSR is communicating the initiatives appropriately to make the society that matters to the organization. For Adams, a good corporate social responsibility or sustainability communicator has few attributes including understanding the social and environmental issues that concern the stakeholders, analyzing the collected data regarding CSR concerns, and seeking to find solutions based on a common ground of participation of whole stakeholders.

For companies to communicate CSR effectively, it is important to clarify few aspects: first clarify to the public what CSR perspectives they have, like CSR values, beliefs, cultures, assumptions, perceptions, and conceptions. Then, companies need to inform the public about their CSR programs, initiatives, and other actions. As the motivation and purposes of those measures and justifying their actions are necessary, assuring implementation, assessment, and recordings is required. Finally, companies need to address the stakeholders and public concerns regarding organizational behavior, actions, or performance. And finding ways to tackle the challenges associated with CSR (Tench et al. 2014). With the unexpected developments in communication and technologies, in the recent digital era, companies have a focus on digital platforms for conveying their CSR quickly and easily. What is experienced today is engaging CSR through social media, while noting the growing prominence of

social media as main communication platform. In essence, social media and digital technologies are far more influential than the traditional communication means. In essence, corporate social responsibility communication is more effective when it is steadily available online. At the digital era and globalization, companies and firms are concerned with their reputations, because using social media to damage a corporate reputation is easy; despite the interactive capacity of social media, companies still mainly apply a broadcasting strategy for the corporate social responsibility communication (Lindgree et al. 2017).

In general, organizations such as business and not-for profit have been using marketing communication functions, tools, and instruments which are led by advertising in the business-to-consumer (B2C) sector, to promote their offering and achieve brand financial and non-financial goals (Shimp 2008). In fact, the concept of business to consumer is aligned with the corporate legitimacy which means the actions of an entity are desirable, proper, or appropriate within some socially constructed systems of norms, values, beliefs, and definitions (Suchman 1995). In general, CSR has been considered as panacea for many social, economic, and environmental problems (Granum Carson et al. 2015). Perhaps there is severe disagreement on companies' intention for maximizing their profit and harming communities while increasing profits. As Friedman (1970) starts that the business responsibility is to increase its profits. While moral and ethical values and principles have been discussed as two features of business, thus companies also can be moral persons (French 1979). To achieve this end, there has been a recent call from politics, civil society, and business for companies to behave socially responsible. However, neo-classical economic literature highlighted the purpose of business as profit maximization. Regardless of the global call for CSR, the failure of CSR is seen in the absence of effective implementation mechanisms (Mühle 2010). The idea of creating good impressions and reputation for corporations has been widely discussed; many scholars have given highlights on the importance of using social media for communicating CSR. In brief, corporations need to know that social media can create awareness among consumers and stakeholders, while it develops a positive CSR perception. Very important aspect is transparency, openness to critics, and trustworthiness as social media is fast and accessible by many people. Regardless of the skeptics, concerns corporation self-interest and whether social media is effective in adding value to CSR (Foxall et al. 2002; Eberle et al. 2013). CSR can boost stakeholders' support for the business. Organizations have come under fire for adopting CSR solely as a marketing tactic to boost sales, build a solid image for themselves, and promote their brands. One can use the attitudes of cigarette corporations as an illustration of how businesses behave when they invest more money in corporate marketing initiatives than they do in charitable endeavors. Frankental clarifies that in a similar vein, CSR may wind up being utilized only as a marketing tactic for the promotion of a brand, with a speech carefully prepared to display to stakeholders (Frankental 2001).

5   Social Responsibility and Profitability

Market orientation has a favorable correlation with corporate profitability, according to research. Both commodity-based and non-commodity enterprises' profitability is significantly influenced by their market orientation. Those with a high market orientation typically have more profitability than businesses with a lower market orientation. Return on investment, a measure of firm profitability, links market orientation to profitability (ROI), discovered through a field interview that profitability is a byproduct of a market orientation rather than a component of it (Narver 1990). According to Vogel (2005), the new CSR landscape highlights the connection between CSR and company financial success. Such emphasis is supported by arguments that stress the relationship between responsibility and profitability and that CSR increases long-term shareholder value. Additionally, he states "70% of global chief executives believe that CSR is crucial to their companies' success, according to a 2002 survey by Price Waterhouse Coopers." This data demonstrates that CSR is becoming a core business activity that is essential to the company's success and central to its entire strategy. Profitability in this conceptualization refers to an improvement in several performance variables relative to competitors.

6   Conclusions and Recommendations

Based on the literature review and the study considered in this study, we recommend corporations to pay special attention to legitimacy of CSR communications, considering social media platforms and the strategies for communicating their initiatives with their stakeholders and community at large (Nielsen and Christa Thomsen 2018). Corporate social responsibility is essential because corporate entities owe a duty to care for society and the well-being of its citizens. Organizations must consider the interests of consumers and society at large in their overall business operations if they want to be seen as socially responsible in their activities and, by extension, in their marketing strategies. However, over time, there have been increasing calls for corporate entities to pay more attention to CSR due to some of their marketing practices that run counter to consumer interests and the general welfare of society. High costs for goods and services, deceptive advertising promotions, dubious quality in differentiated items, the formation of false demands, and materialism preoccupation are only a few examples of negative marketing tactics. This chapter concludes that it is even in business organizations' best interests to be careful with their marketing decisions, avoiding any hostile activities that would endanger their continued existence and their ability to operate profitably in society.

References

Adams AC (2015). The art of communicating corporate social responsibility—and some learnings from VW. Available at: https://drcaroladams.net/the-art-of-communicating-corporate-social-responsibility-and-some-learnings-from-vw (Accessed on June 10, 2022)

Bakan J (2004) The corporation. constable and Robinson, London

Baker JM, Saren M (2010). Marketing theory: a student text. Sage, Thousand Oaks, California.

Banerjee SB (2007) Corporate social responsibility: the good, the bad and the ugly. UK, Edward Elgar, Cheltenham

Bhattacharya CB, Sen S, Korschun D (2011) Leveraging corporate responsibility: the stakeholder route to maximizing business and social value. Cambridge University Press, Cambridge UK

Blacconiere WG (1997) Environmental information and market reactions to environmental legislation. J Account Audit Finance: 149–178.

Bruntland G (1987) Our common future. World Comm Environ 1 Dev 2(1):45–65

Coombs TW, Holladay SJ (2012) Managing corporate social responsibility: a communication approach. Wiley, West Sussex, UK.

Demmerling T (2015) Corporate social responsibility overload? Anchor Academic Publishing, Hamburg, Germany

Eberle D, Berens G, Li T (2013) The impact of interactive corporate social responsibility communication on corporate reputation. J Bus Ethics 118(4):731–746

European Commission (2011) Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions: a renewed EU strategy 2011–14 for corporate social responsibility. Available at: http://www.europarl.europa.eu/meetdocs/2009_2014/documents/com/com_com(2011)0681_/com_com(2011)0681_en.pdf (Accessed June 23, 2022).

Frankental P (2001) Corporate social responsibility—a PR invention? Corp Commun An Int J: 18–23

Friedman M (1970) A theoretical framework for monetary analysis. J Polit Econ 78(2):193–238

French PA (1979) The corporation as a moral person. Am Philos Q 16(3):207–215

Goncalves G (2013) The (in) communicability of corporate social responsibility—a Portuguese insight. Organisational and Strategic Communication Research: European Perspectives:143–165.

Graafland JJ, Fijffinger SCW, Stoffele NCGM, Simd H, Codleweijer AM (2004) Corporate social responsibility of Dutch companies: Benchmarking, transparency and robustness. De Economist, Springer 152(3):403–426

Grayson D, Hodges A (2004) Corporate social opportunity!: seven steps to make corporate social. Routledge, New York, USA

Haynes K, Murray A, Dillard J (2013) Corporate social responsibility: a research handbook. Routledge, New York, USA

Idowu SO, Vertigans S (2017) Stages of corporate social responsibility: from ideas to impacts. Springer, Switzerland

Isaksson et al (2014) Corporate social responsibility: why bother? Organ Dyn 2014(43):64–72

Kotler P, Lee N (2005) Corporate social responsibility: doing the most good for your company and your cause. Wiley, New Jersey, Canada

Kotler P, Levy S (1969) Broadening the concept of marketing. J Mark 33:5–15

Kramer MR, Porter ME (2006) Strategy & society; the link between competitive advantage and corporate social responsibility. Harv Bus Rev 84(12):78–92

Lindgree A, Vanhamme J, Maon F, Mardon R (2017) Communicating corporate social responsibility in the digital era Routledge.

McWilliams et al (2019) The oxford handbook of corporate social responsibility: psychological and organizational perspectives. Oxford University Press, Oxford UK

Moon J (2014) Corporate social responsibility: a very short introduction. Oxford University Press, Oxford UK

Morsing M, Schultz M (2006) Corporate social responsibility communication: stakeholder information, response and involvement strategies. Bus Ethics: Eur Rev 15(4):323–338

Mühle U (2010) The politics of corporate social responsibility: the rise of a global business norm. Frankfurt, Germany, DFG/ Hans Sauer Stiftung.

Narver JSS (1990) The effect of market orientation on business profitability. J Mark 54(4):20–35

Nielsen (2015) Green generation: millennials say sustainability is a shopping priority, Sustain. Available at: https://www.sustainmag.ca/green-generation-millennial-say-sustainability-is-a-shopping-priority/ (accessed 16 May 2021)

Nielsen AE, Thomsen C (2018) Reviewing corporate social responsibility communication: a legitimacy perspective., corporate communications: An International Journal, 23(4). Emerald Publishing 492–511:1356–3289. https://doi.org/10.1108/CCIJ-04-2018-0042

Polonsky M, Jevons C (2009) Global branding and strategic CSR: an overview of three typologies of complexity. Int Mark Rev 26(3):327–347

Porter ME, Kramer MR (2002) The competitive advantage of corporate philanthropy. Harvard Bus Rev, 80(12), 56–69Top of Form

Rahbek E, Pedersen G (2015) Corporate social responsibility. SAGE, London

Ramesh K, Saha R, Goswami S, Sekar, Dahiya R (2019) Consumer's response to CSR activities: mediating role of brand image and brand attitude. Corp Soc Responsib Environ Manag: 377–387.

Rasche A, Morsing M, Moon J (2017) Corporate social responsibility, strategy, communication, governance. United Kingdom, Cambridge University Press, Cambridge

Rodrigues P, Borges A, Vieira E (2020) Corporate social responsibility image and emotions for the competitiveness of tourism destinations. J Place Manag Dev:134–147

Sandoval M (2014) From corporate to social media: critical perspectives on corporate social responsibility in media and communication industries. Routledge, New York

Schmeltz L (2012) Consumer-oriented CSR communication: focusing on ability or morality? Corp Commun Int J:29–49.

Shamir R (2005) Without borders? Notes on globalization as a mobility regime. Sociol theor 23(2):197–217

Shimp 2008 in: Kitchen J P, Uzunoglu E (2014) Integrated communications in the postmodern era. Palgrave Macmillan.

Suchman MC (1995) Managing legitimacy: strategic and institutional approaches. Acad Manag Rev 20(3):729–757

Tench R, Sun W, Jones B (2014) Communicating corporate social responsibility: perspectives and practice. UK, Emerald.

Turker D (2018) Managing social responsibility: functional strategies, decisions and practices. Springer, Cham, Switzerland.

Urip S (2010) CSR strategies: corporate social responsibility for a competitive edge in emerging markets. Wiley, Hoboken, USA.

USA. T. i. (2010). Arevalo JA. Aravind D. Corp Gov:406–420.

Vogel DJ (2005) Is there a market for virtue? the business case for corporate social responsibility. Calif Manage Rev 47(4):19–45. https://doi.org/10.2307/41166315

Žukauskas P, Vveinhardt J, Andriukaitienė R (2018) Management culture and corporate social responsibility. IntechOpen, London, UK

Artificial Neural Network and Structural Equation Modeling Techniques: Future Research Directions

Artificial Neural Network and Structural Equation Modeling in the Future

Marcos Ferasso and Alhamzah Alnoor

1 Introduction

The Social Sciences field of study adopts different statistical methods and approaches. Statistical applications and methods have expanded tremendously thanks to the rise of many organizational problems that needed to be resolved through the implementation of critical statistical techniques (Leong et al., 2020a). The main benefit of statistical methods in the Social Sciences is the understanding and interpretation of relations between/among variables (Hair et al., 2014). Many open issues and challenges that the literature still suffers from have led to the emergence of advanced statistical methods (Sarstedt et al., 2014). Multivariate analysis is a method for solving complex problems in the Social Sciences by capturing the relations between constructs (Sarstedt et al., 2022). The multivariate analysis consists of first- and second-generation technologies. Regression, linear, logistic regression, analysis of variance, confirmatory, and exploratory methods are examples of first-generation techniques. However, the second-generation techniques are basically the Structural Equation Modeling (SEM) (Hair et al., 2021).

SEM technique involves two methods: (i) the Covariance-Based SEM (CB-SEM) approach and (ii) the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach (Hair et al., 2017; Lo et al., 2022). CB-SEM is used to interpret an existing theory, while PLS-SEM is applied for exploratory and confirmatory research. The SEM approach has become a typical method in social research and has been widely

M. Ferasso (✉)
Economics and Business Sciences Department, Universidade Autónoma de Lisboa, 1169-023 Lisboa, Portugal
e-mail: admmarcosferasso@gmail.com

A. Alnoor
Southern Technical University, Management Technical College, Basrah, Iraq
e-mail: Alhamzah.malik@stu.edu.iq

School of Management, Universiti Sains Malaysia, 11800 Pulau Pinang, Malaysia

accepted (Harrison & Hair, 2017). Investigational evidence confirms the benefits of PLS-SEM approach is capturing the linear relations between constructs (Albahri et al., 2021). Nevertheless, the issue of capturing nonlinear and non-compensatory relations remains an open issue that needs an immediate solution (Alnoor et al., 2022). Therefore, many statistical techniques have emerged to complement the work of the SEM approach by capturing nonlinear and non-compensated relations between variables. The Artificial Neural Network (ANN) approach is vital for validating SEM results and for nonlinear relationships between constructs (Khaw et al., 2022). The SEM-ANN two-stage approach has been used extensively and by different studies (Albahri et al., 2021; Ng et al., 2022). The purpose of using two-stage SEM and ANN technology is to create linear and non-compensated interactions. ANN technology captures non-compensated interactions based on Artificial Intelligence (AI) black box technology (Abdullah et al., 2022; Tewari et al., 2022). In this context, the number of contributions that adopted the hybrid SEM-ANN approach has increased in the last years. However, the application mechanism of ANN with SEM remains to be investigated further in the field of Social Sciences (Wang et al., 2022). This chapter highlights the concept of SEM and ANN and provides future directions for the upcoming literature.

2   Exploring the Relations Between ANN and SEM

To conduct causal relations between constructs, determine linear connections between variables, verify the results of linear relations, and predict non-compensatory relations, a double-step SEM-ANN approach was applied in family businesses of Malaysia. Several reasons dictated such approach. In the mathematical model, a reduction in one component is assumed to be rewarded for by an increase in another component by detecting linear relations based on the SEM model. Thus, SEM method suffers from exploring nonlinear relations between variables. Moreover, ANN approach can detect non-compensatory and nonlinear relations using a nonlinear model (Najmi et al., 2021). The ANN approach captures nonlinear and compensatory relations using prediction based on a black box process (Ooi et al., 2018). To this end, this study developed a two-step SEM-ANN approach to addresses SEM barriers (Leong et al., 2020a).

   The two-step SEM-ANN approach used in this study is in line with several of the literature that has adopted such a method (e.g., Li et al., 2019; Sharma and Sharma, 2019; Raut et al., 2018a). This study adopted a one-layer neural network involving feed-forward-backpropagation (FFBP) single-layer perceptron (MLP). The MLP involves input, hidden, and output layers. Each layer includes neurons are interrelated with neurons of other layers through synaptic weights. FFBP neural networks feed signals forward from the input to the output layer via the hidden layer. On the other hand, the current study used a ten-fold ANN analysis to evade the potential problem of overfitting. The evaluation data was assigned 10%, whereas the training data was assigned 90%. In addition, the output layers and hidden layers activation

functions were sigmoid functions (Sila & Walczak, 2017). Neurons calculate the output by accumulating the stimulus they receive from a particular input vector, x. Input component-i weights are represented by Wji, while hidden neuron-j weights are represented by Wji and Wjk, respectively. As simply in Eqs. 1, 2, and 3.

$$net_j^h = \sum_{i=1}^{N} Wji x_i \, and \, Y_i = f\left(net_j^h\right) \tag{1}$$

For the k-th output neuron,

$$net_k^0 = \sum_{j=1}^{J+1} V_{kj} y_j \, and \, o_k = f\left(net_k^0\right) \tag{2}$$

$$f(net) = \frac{1}{1 + e^{-\lambda net}} \tag{3}$$

As a result of such learning process, a network will generate an output based on a specific input pattern, which will be matched to the desired response of every neuron. Furthermore, the weights will be adjusted in the future to minimize or rectify the error and the pattern will be forwarded. Equations 4, 5, and 6 were used for calculating the weight adjustment formula for output layer weights V, while equation four is used for calculating the weight adjustment formula for hidden layer weights W. For input pattern-p, dpk is the desired output of neuron-k, while opk is the actual output of neuron-k (Radman & Abdelrahman, 1995).

$$V_{kj}(t + 1) = v_{kj}(t) + c\lambda(d_k - o_k)o_k(1 - o_k)y_i(t) \tag{4}$$

$$W_{ji}(t + 1) = W_{ji}(t) + c\lambda^2 y_j\left(1 - y_j\right)$$
$$x_i(t)\left(\sum_{k=1}^{k}(d_k - o_k)o_k(1 - o_k)V_{kj}\right) \tag{5}$$

$$SSE = \frac{1}{2P} \sum_{p=1}^{p} \sum_{k=1}^{k}(d_{pk} - o_{pk})^2 \tag{6}$$

Small and comparable mean RMSE values indicate that the ANN model can produce accurate predictions and is a good fit for the data. On the basis of ten-fold ANN, the number of non-zero synaptic weights linked with hidden neurons would be used to validate the fit of the predictors. Sensitivity analysis would be performed to predict the contribution of each variable to the independent variable. Scholars can calculate normalized significance in terms of percentage based on the proportional significance fraction of each input neuron divided by the greatest relative importance. In terms of the overall contribution of input neurons, ongoing and future research can

identify the most contributing predictor. Hence, the future directions will determine average weights of the input and hidden neurons in the ten-fold ANN. Furthermore, ongoing research will realize the most contributing of the hidden neuron such as H (1:1), H (1:2), and H (1:3). Finally, the future directions can calculate a quality index that can be referred to R^2 as follows:

$$R^2 = 1 - \frac{RMSE}{S_y^2} \tag{7}$$

where S_y^2 is the variance favored outcome in line with the average of SSE. The result will show prediction accuracy of the model for ANN approach.

3 The Benefits of Structural Equation Modeling and Artificial Neural Network Approach

This section describes mobile ANN and SEM, and many previous studies discussed such approach. According to Islam et al. (2020), two-phase SEM–ANN method is considered a critical issue. However, the main outcome of the coupling of SEM and ANN is that the application of the multi-analytical double-phase SEM–ANN method yields two essential advantages. First, it permits extra validation of the SEM analysis results. Second, it captures not only just linear but also dynamic nonlinear relations between dependent and antecedents' factors, as well as a more precise measurement of each predictor's relative strength.

SEM could establish the links between undiscovered variables, i.e., dependent factors, mediating variables, moderating variables, control variables, and independent variables (Hew et al., 2018). This academic field was distinguished by the evaluation of multiple variable-cause correlations. The most focus was paid to behavioral intention and acceptance of new technology (e.g., health apps, mobile payment, green issue sustainability and mobile commerce, trust in social media, the integrated model of acceptance and utilization of technology, and cloud computing) (Foo et al., 2018). In this type of study, the coupling of ANN and SEM aims to adapt technology, reduce resistance to novelty, and increase perceived responsiveness (Leong et al., 2020a). The PLS-SEM method is superior to the CB-SEM method in terms of statistical precision of causal theories.

In Social Sciences research, PLS-SEM is becoming increasingly prevalent and widespread. Numerous researchers contribute to the application of PLS-SEM to solve problems that CB-SEM cannot (Talukder et al., 2020). Moreover, this approach is an effective methodology for building and assessing theories and examining the relations between factors; the conceptual constructs consist of independent, mediating, moderating, and dependent variables (Lee et al., 2020). Consequently, the PLS-SEM approach is suitable for identifying the causal link. In addition, PLS-SEM has analytical benefits, such as R2 and Q2 rates (Chen et al., 2020). PLS-SEM employs

a complex framework that addresses moderator and mediator variables, which is consistent with existing literature dealing with SEM to understand and forecast the constraints' drivers (Nair et al., 2017). Thus, the SEM approach finds linear and compensatory correlations among restrictions in order to elucidate the influence mechanism among them (Ray et al., 2021).

The usefulness of SEM is its ability to describe the linear and compensating causal relations between the constraints. Furthermore, SEM cannot investigate the nonlinear interaction between constructs. Consequently, ANN analysis has emerged as a crucial technique that supports the work of PLS-SEM. Using the compensatory model, the ANN technique may discover nonlinear and non-compensatory interactions, allowing it to handle complicated processes in human decision-making (Talukder et al., 2020). The ANN technique also ranks and verifies the model's significant predictors (Lee et al., 2016). In addition, the ANN technique handles both nonlinear and linear connections because it relies on the algorithm's black box process, which serves as the basis for the prediction (Alam et al., 2021). Thus, the feed-forward-back-propagation ANN algorithm's multilayer expectations yielded normalized significance (Abbasi et al., 2021).

According to Priyadarshinee et al. (2017), the advantages of merging SEM and ANN are customer demand analysis, smartphone buyback, explaining the process of faith in online marketing, and forecasting the promoters influencing cloud computing implementation. Moreover, the ANN approach justifies SEM data and interprets the most significant components. However, ANN analysis cannot be used to test hypotheses because it is dependent on the black box (Kalinić et al., 2021). On the other hand, the ANN model assists in determining the relative significance of mobile app adoption factors across sectors (Sharma et al., 2018; Kalinic et al., 2019). Combining the ANN approach with the SEM technique offers a fresh perspective on the development of nonlinear models (Najmi et al., 2021).

4   Artificial Neural Network and Structural Equation Modeling: Systematic Literature Review

A systematic literature review based on ANN and SEM was conducted in chapter one. The Scopus database was chosen due it reported more results for the Business Management field of study. In total, 74 papers were found and were used in the analyses. In the literature, several problems with SEM-ANN are explained. The research design, country, study population, industry, methodology, and variables all provide challenges. The research design is the overall technique chosen by the researcher to integrate the study numerous components in a logical and consistent manner. As it is fascinating to observe how market expectations evolve over time, prospective researchers are increasingly shifting their focus from study design to longitudinal research (Ooi et al., 2016). In addition, the transversal character of the data collection approach impedes an accurate evaluation of the behavioral growth of

users. Consequently, the longitudinal method is useful since it can assess the strength of the associations (Ooi et al., 2018).

Regarding the research goals, the sector indicates whether the study will be applied to private or public companies. Most of the reviewed literature focused on mobile payment challenges, sustainability, environmental concerns, mobile commerce and health apps, social media trust, the integrated theory of technology acceptance and use, and cloud computing. Nevertheless, the sample size precludes generalization of the results. Consequently, the new technological sector is both a challenge and a limitation for future literature aimed at other industries. Various industries can produce distinct results (Ooi et al., 2018). Hence, several scholars are focused on the hotel industry, which affects results generalization to many industries, such as airways (Abubakar et al., 2017).

Concerning sustainability, the impact of green practices on the sustainability performance of manufacturing firms has been examined, but these findings cannot be generalized to all industries. The academics could explore sustainability problems and carbon dioxide emissions generated by the transportation industry by focusing on service providers of and logistics transportation. Other studies used SEM and ANN to acquire data from public universities through questionnaires and interview, which led to bias (Sharma et al., 2016). The examined research was limited to small- and medium-sized businesses. Future research may limit the sample to secondary businesses, such as hardware and food items (Lee et al., 2016).

Several research concentrated on a single country without considering cultural differences among nations, making it challenging to adapt the findings to other nations. As a result, researchers are asked to examine other nations, particularly in developing nations, to determine if the gender norms persist and show the same outcomes. Future research should consider comparing at least two countries (Alkawsi et al., 2021). Other authors have focused on domestic tourists, and future research can undertake a comparative study using a sample of international and domestic visitors in a multinational setting (Li et al., 2019). In addition, acceptance of new technology and the assessment of the intention to practice used as a basis for the examination in other countries (Sharma et al., 2016).

As stated in Sect. 4.2, most of the literature focuses on the context of Malaysia. It is required to undertake an updated study in different geographical regions because the results were limited to this country context (Leong et al., 2020a). The majority of studies were conducted in Asian nations; hence, the results cannot be generalized, and future studies must be implemented in European regions (Kalinic et al., 2019). In other words, it will be fascinating to evaluate the numerous cultural elements that influence customer behavior.

The main goal of quantitative studies in selecting the sample size is to collect data, whether secondary or primary, and to finalize findings that have theoretical and practical relevance for academics and practitioners. The academic publications have concentrated on data collection from users in order to investigate and assess customer demand. Moreover, additional research is required as user-product interactive data may be used and gathered to create more accurate framework (Raut et al.,

2018a). Moreover, the sample selection influences the validity of the findings. Therefore, researchers are advised to extend their area of sample selection to improve the sample size's representativeness (Hew et al., 2018). In summary, research may investigate disparities in mobile technology acceptance across age groups (Alam et al., 2020). The second concern is that probability sampling methods cannot be generalized. Future research should advocate for a non-probability sampling strategy (Hew et al., 2018). In addition, the snowball sampling strategy for data gathering might be rejected in SEM and ANN investigations in favor of cluster sampling (Sharma et al., 2016). Literature has also accepted data collecting from social media users, but it is possible to perform further studies by focusing on social platforms such as Telegram, WhatsApp, and Messenger. Further empirical research emphasizes the acceptance of social responsibility based on the responses of small- and medium-sized business owners. Further incorporating the opinion of employees, managers, and SME owners may lessen sample size bias (Ahani et al., 2017).

Numerous researchers employed a quantitative research method (100 percent self-administered survey), and numerous nonverbal communication data collected through qualitative, or hybrid research methods were not considered (Foo et al., 2018). Qualitative research approaches, such as in-depth interviews and observation, might compensate for some of the informational shortcomings of quantitative methods. Using a survey hypothesis, questionnaire is investigated using the SEM and ANN technique. Thus, the majority of the relevant research focuses on survey investigations. Nonetheless, researchers may utilize different analytical and statistical techniques, like, ANP (analytical network process), MLR (multiple linear regression), (TOPSIS) method, and (DEMATEL) decision-making trial assessment laboratory (Raut et al., 2018a). Several scholars have employed the backpropagation learning technique in their work. In the early stages of research, backpropagation-trained neural networks outperform those trained using radial basis function (RBF) learning approaches. Future research (Sila and Walczak, 2017) may investigate and integrate more training strategies, including Bayesian-trained ANNs and unsupervised learning approaches. There is an urgent need for a more extensive statistical analysis to identify more attractive outcomes, particularly a qualitative study that helps academics and practitioners explore more implications and information (Alam et al., 2020). The researchers verified the research model using SEM and ANN without addressing a multi-staged computational strategy using other non-compensatory and nonlinear methods such as fuzzy set, assistance path system, and random forest (Talukder et al., 2020). The findings differ under a multi-set of deep ANN design, and the results of prior studies can be compared to identify the optimum architecture for their respective circumstances (Lee et al., 2020). Wide ANN necessitates that researcher equal ANN findings with one and multiple layers in order to arrive at a consensus regarding the optimal architecture (Abbasi et al., 2021). Thus, the software for the ANN approach contains three activation tasks (hyperbolic tangent, sigmoid, and identity). Due to a number of frequently used and well-known activation task types, it would be necessary to compare and adopt the framework with these activation functions (Kalinić et al., 2021). In addition, various neural networks including

genetic algorithm and machine learning should be utilized (Kheirollahpour et al., 2020).

Variables reported in the literature review argued that perceived ease of use had a significant impact on mobile shopping intentions due to significant experience. Therefore, the scholars might utilize unskilled respondents to validate the findings. Some researchers examine the relationship between disasters and social media. This topic raises crucial and confusing questions that require additional investigation: During a crisis, why do mobile social media users share information? How will mobile social media users' information-sharing behavior be improved? (Li et al., 2019). It would be useful to examine additional characteristics such as gender of respondent, age, and degree of experience, in relation to similar payment systems in light of the knowledge acquired concerning the implementation of mobile payment (Sharma and Sharma, 2019). Therefore, studies can study gender disparities in e-commerce trust. It utilizes social connection theory, social network theory the probability of detail model, and the Big Five model to enhance prediction ability (Leong et al., 2020a). Due to its emphasis on specific characteristics, the ANN model cannot account for 100 percent assurance in online advertising. Adding more hypotheses boosts the research model's forecasting ability (Leong et al., 2020a). Similarly, the ANN model has a prediction accuracy of 76.4 percent. Future research may employ a comparative analysis of customer rejection to mobile wallets in emerging economic situations and industrialized (Leong et al., 2020a). Furthermore, perceptions of risk and security could influence electronic commerce (Raut et al., 2019). Numerous published works have utilized the UTAUT2 and UTAUT concepts. Additionally, there are a number of technological acceptance models that center on information systems. Merging or extending research models can enhance outcomes and provide a comprehensive perspective of aspects such as cloud computing (Ooi et al., 2018). Environmental concerns, the attribution of knowledge and responsibility, have been identified in the literature as factors that influence customer involvement in environmental management (Najmi et al., 2021). Therefore, the literature evaluation should expand the existing theoretical model to offer a new perspective for nonlinear model construction (Ooi et al., 2016). Previous study has examined the impact of a limited number of technology adoption examples. Introducing other factors such as, comparative advantage, perceived awareness, personality traits, suitability, experiential drive, and technical familiarity will be crucial (Kalinic et al., 2019). Determining the effect of privacy on adoption decisions and confidentiality, data integrity, and blockchain's function in preserving sensitive information is necessary (Wong et al., 2020).

5 Recommendations of the Previous Studies for SEM and ANN Analysis

SEM was established to analyze the causal linkages between variables and to evaluate consumer behavior in order to discover the aspects that influence smartphone user attitudes (Chen et al., 2020). The brand is associated with the users' inclination to repurchase smartphones for continuity purposes (Hew et al., 2018). Environmental motivations (i.e., service quality, social presence, and perceived mobility) influence mobile social tourism via perceived utility and reported enjoyment (Hew et al., 2018). In emergency situations, social media influences mobile phone usage (Li et al., 2019). Using structural equation modeling, the factors that influence mobile payment acceptance were identified. The authors determined that observed utility and perceived security are the most influential variables on intent to use (Liébana et al., 2018). In addition, the effect of social presence and information assistance on m-commerce confidence is influenced by engagement with vendors and revenue (Leong et al., 2020a). Rejection of mobile wallets is significantly influenced by, risk barrier, novelty perception, tradition barrier, value barrier, risk barrier, income, and education. (Leong et al., 2020a). In contrast, government subsidies and dependability proven to be the primary drivers of electric automobiles. In addition, shipping time, the limited range, and lower infrastructure accessibility have a detrimental effect on the perception of reliability. According to the findings of previous literature Ooi et al., (2018), business size performance expectations, absorptive capacity, and business size have a positive effect on novelty. The researchers' recommendations underline the significance of green supply chain management techniques as solutions for promoting sustainability. In another research, Structured Equation Modeling was used to identify dynamic aspects (i.e., UTAUT variables, channel characteristics, means of uncertainty reduction, information quality, and attitude to use) that influence users' adoption of mobile applications for government services (Sharma et al., 2018). SEM revealed that, resource sharing, perceived benefit, social collaboration, UTAUT2 and, perceived enjoyment were the most influential drivers of Facebook use for educational concerns, bitcoin adoption, and mHealth apps (Shukla, 2021). In addition, social responsibility influences colleges' efforts to become more competitive. On the other hand, intention to use and satisfaction are crucial precursors to real use of mobile banking services (Sharma and Sharma, 2019). Lastly, performance expectation, functional unity social influence, hedonic motivation, and self-actualization have an effect on the acceptance of wearable payment and wearable healthcare technology (Lee et al., 2020).

The ANN model could take benefit of nonlinearity and deliver more trustworthy results for consumer preference analysis (Chen et al., 2020). Furthermore, female customers are more attentive to perceived benefit, whereas male consumers are more responsive to brand (Hew et al., 2017). Results from the ANN reveal the significance of desire to use social media in emergency situations (Islam et al., 2020). The findings of the neural network analysis reflect the results of the structural equation modeling by providing a distinct influence ranking for the most significant

consumers of mobile payment (Cabanillas et al., 2018). The ANN version (i.e., income, social presence, age, demographic reports of gender, social support, and education) predicts that 76.9% of consumers will have faith in m-commerce (Leong et al., 2020a). According to ANN's sensitivity study results, consistency, followed by time spent, website quality, and reputation are the most important prerequisites for trust in online advertising (Leong et al., 2020a). In addition, the ANN model (perceived novelty, demographic characteristics, and innovation resistance theory) accurately predicts 76.4 percent of mobile wallet resistance (Leong et al., 2020a).

In addition, there are disparities between the ranks of ANN and SEM predictors (Castillo et al., 2020). The predictions of artificial neural networks support the use of cloud computing to enhance business performance and innovativeness (Ooi et al., 2018). ANN findings indicate that the impact of worker cynicism on job withdrawal is 6,7 times greater for women than for men; the effect of favoritism on work withdrawal was 2,1 times greater for women than for men. Consequently, neural networks give more accurate demand forecasting than multiple linear regression (Nair et al., 2017). The ANN model demonstrates that risk perception, management style, and confidence are the most significant determinants of cloud computing (Priyadarshinee et al., 2017). Other authors employed the neural network model to validate SEM outcomes. The results reveal that expected performance and confidence are the most beneficial mobile application characteristics for government services. In addition, perceived awareness, perceived response time, and perceived compatibility are three crucial characteristics that determine adoption behavior (Shahzad et al., 2020). Similarly, it was discovered that privacy issues negatively affect the implementation of smart meter technologies. Simultaneously, technical knowledge and environmental reactions were crucial variables influencing smart meters (Alkawsi et al., 2021). According to the findings of ANN Tiruwa et al. (2018), collaboration is the most significant predictor of Facebook's implementation for mHealth apps and academic purposes, followed by perceived satisfaction, perceived benefit, perceived enjoyment, and resource sharing. According to ANN results, community-focused social responsibility is a crucial aspect in enhancing universities' competitiveness.

6 Suggestions for Future Research

In line with any study, the SEM and ANN studies have a number of limitations that open up prospects for future research. First, the previous studies adopted a deductive approach. The use of the longitudinal approach makes many practical and theoretical contributions to practitioners and academics. The role of social support theories, planned behavior, and emotional theories was investigated using a dual-stage hybrid SEM-ANN approach. In this context, many important theories regarding attitudes and behavior have not been investigated. Therefore, the investigation and explore the other factors by adopting a multi-group SEM is needed. The adoption of the linear and non-compensatory relationships based on SEM and ANN approaches has shed light and predicted many determinants of behavior. However, exploring

the similarities and differences between different cultural contexts further develops business management theories and extends contributions to practitioners. To this end, adopting more sophisticated techniques such as fuzzy set qualitative comparative analysis (fsQCA), Necessary Condition Analysis (NCA), and the neuro-fuzzy inference system (ANFIS) approach would shed light on several determinants that limit certain behaviors. In addition, many environmental and behavioral issues can be addressed.

7 Conclusion

This chapter provides an overview of the application of the SEM approach with ANN to capture linear and non-compensated relationships between variables. Furthermore, the benefits of using such an approach are described. In addition, the most important recommendations were explained by the previous literature regarding this analysis. However, many approaches have been discussed by the previous literature to complement the work of SEM. Because the SEM method suffers from problems of capturing nonlinear relationships. Thus, it is possible for future literature to apply more accurate techniques to the results, such as the neuro-fuzzy inference system (ANFIS) approach. However, there is an emerging approach arguing the integration of SEM with Necessary Condition Analysis (NCA). To this end, many approaches are adopted with the SEM method in order to predict the most important determinants that hinder a phenomenon. Therefore, future literature should be interested in further investigation of such innovative approaches.

References

Abbasi GA, Tiew LY, Tang J, Goh YN, Thurasamy R (2021) The adoption of cryptocurrency as a disruptive force: Deep learning-based dual stage structural equation modelling and artificial neural network analysis. PLoS ONE 16(3):e0247582

Abdullah H, Thajil K, Alnoor A, Al- H, Khaw KW, Chew XY, Sadaa A (2022) Predicting determinants of use mobile commerce through modelling non-linear relationships. Cent Eur Bus Rev 11(1):1–24

Abubakar AM, Namin BH, Harazneh I, Arasli H, Tunç T (2017) Does gender moderates the relationship between favoritism/nepotism, supervisor incivility, cynicism and workplace withdrawal: A neural network and SEM approach. Tour Manag Perspect 23:129–139

Ahani A, Rahim NZA, Nilashi M (2017) Forecasting social CRM adoption in SMEs: A combined SEM-neural network method. Comput Hum Behav 75:560–578

Alam MMD, Alam MZ, Rahman SA, Taghizadeh SK (2021) Factors influencing mHealth adoption and its impact on mental well-being during COVID-19 pandemic: A SEM-ANN approach. J Biomed Inform 116:103722

Alam MZ, Hu W, Kaium MA, Hoque MR, Alam MMD (2020) Understanding the determinants of mHealth apps adoption in Bangladesh: A SEM-Neural network approach. Technol Soc 61:101255

Albahri AS, Alnoor A, Zaidan AA, Albahri OS, Hameed H, Zaidan BB, … & Yass AA (2022) Hybrid artificial neural network and structural equation modelling techniques: A survey. Complex Intell Syst, 8(2), 1781-1801.

Albahri AS, Alnoor A, Zaidan AA, Albahri OS, Hameed H, Zaidan BB, Yass AA (2021) Hybrid artificial neural network and structural equation modelling techniques: A survey. Article in press, Complex & Intelligent Systems, pp 1–21

Alkawsi GA, Ali N, Mustafa AS, Baashar Y, Alhussian H, Alkahtani A, … & Ekanayake J (2021) A hybrid SEM-neural network method for identifying acceptance factors of the smart meters in Malaysia: Challenges perspective. Alex Eng J, 60(1), 227-240.

Alnoor A, Al- H, Al H, Khaw KW, Chew X, Al- M, Alharbi RK (2022) Uncovering the antecedents of trust in social commerce: An application of the non-linear artificial neural network approach. Compet Rev 32(3):492–523

Asadi S, Abdullah R, Safaei M, & Nazir S (2019) An integrated SEM-Neural Network approach for predicting determinants of adoption of wearable healthcare devices. Mob Inf Syst, 2019.

Asadi S, Nilashi M, Samad S, Rupani PF, Kamyab H, Abdullah R (2021) A proposed adoption model for green IT in manufacturing industries. J Clean Prod 297:126629

Chen CC, Tsang SS (2019) Predicting adoption of mobile payments from the perspective of taxi drivers. IET Intel Transport Syst 13(7):1116–1124

Chen H, Liu H, Chu X, Zhang L, Yan B (2020) A two-phased SEM-neural network approach for consumer preference analysis. Adv Eng Inform 46:101156

Duan SX, Deng H (2021) Hybrid analysis for understanding contact tracing apps adoption. Ind Manag Data Syst 121(7):1599–1616

Hair F Jr J, (2014) Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. Eur Bus Rev 26(2):106–121

Féraud R, Clérot F (2002) A methodology to explain neural network classification. Neural Netw 15(2):237–246

Foo PY, Lee VH, Tan GWH, Ooi KB (2018) A gateway to realising sustainability performance via green supply chain management practices: A PLS–ANN approach. Expert Syst Appl 107:1–14

Hair JF, Astrachan CB, Moisescu OI, Radomir L, Sarstedt M, Vaithilingam S, Ringle CM (2021) Executing and interpreting applications of PLS-SEM: Updates for family business researchers. J Fam Bus Strat 12(3):1–8

Hair JF, Hult GTM, Ringle CM, Sarstedt M, Thiele KO (2017) Mirror, mirror on the wall: A comparative evaluation of composite-based structural equation modeling methods. J Acad Mark Sci 45(5):616–632

Harrison DE, Hair JF (2017) The use of technology in direct-selling marketing channels: Digital avenues for dynamic growth. J Mark Channels 24(1–2):39–50

Hew JJ, Badaruddin MNBA, Moorthy MK (2017) Crafting a smartphone repurchase decision making process: Do brand attachment and gender matter? Telematics Inform 34(4):34–56

Hew JJ, Leong LY, Tan GWH, Lee VH, Ooi KB (2018) Mobile social tourism shopping: A dual-stage analysis of a multi-mediation model. Tour Manage 66:121–139

Islam AN, Laato S, Talukder S, Sutinen E (2020) Misinformation sharing and social media fatigue during COVID-19: An affordance and cognitive load perspective. Technol Forecast Soc Chang 159:120201

Kalinić Z, Marinković V, Kalinić L, Liébana-Cabanillas F (2021) Neural network modeling of consumer satisfaction in mobile commerce: An empirical analysis. Expert Syst Appl 175:114803

Kalinic Z, Marinkovic V, Molinillo S, Liébana-Cabanillas F (2019) A multi-analytical approach to peer-to-peer mobile payment acceptance prediction. J Retail Consum Serv 49:143–153

Khan GF, Sarstedt M, Shiau WL, Hair JF, Ringle CM, & Fritze MP (2019) Methodological research on partial least squares structural equation modeling (PLS-SEM): An analysis based on social network approaches. Int Res.

Khaw KW, Alnoor A, Al-Abrrow H, Chew X, Sadaa AM, Abbas S, & Khattak ZZ (2022) Modelling and evaluating trust in mobile commerce: A hybrid three stage Fuzzy Delphi, structural equation modeling, and neural network approach. Int J Hum–Comput Int, Article in press, 1–17.

Lee VH, Foo ATL, Leong LY, Ooi KB (2016) Can competitive advantage be achieved through knowledge management? A case study on SMEs. Expert Syst Appl 65:136–151

Lee VH, Hew JJ, Leong LY, Tan GWH, Ooi KB (2020) Wearable payment: A deep learning-based dual-stage SEM-ANN analysis. Expert Syst Appl 157:113477

Leong LY, Hew TS, Ooi KB, Chong AYL (2020a) Predicting the antecedents of trust in social commerce–A hybrid structural equation modeling with neural network approach. J Bus Res 110:24–40

Leong LY, Hew TS, Ooi KB, Dwivedi YK (2020b) Predicting trust in online advertising with an SEM-Artificial neural network approach. Expert Syst Appl 162:113849

Leong LY, Hew TS, Ooi KB, Wei J (2020c) Predicting mobile wallet resistance: A two-staged structural equation modeling-artificial neural network approach. Int J Inf Manage 51:102047

Li Y, Yang S, Zhang S, Zhang W (2019) Mobile social media use intention in emergencies among Gen Y in China: An integrative framework of gratifications, task-technology fit, and media dependency. Telematics Inform 42:101244

Liébana-Cabanillas F, Marinković V, Kalinić Z (2017) A SEM-neural network approach for predicting antecedents of m-commerce acceptance. Int J Inf Manage 37(2):14–24

Liébana-Cabanillas F, Marinkovic V, de Luna IR, Kalinic Z (2018) Predicting the determinants of mobile payment acceptance: A hybrid SEM-neural network approach. Technol Forecast Soc Chang 129:117–130

Liébana-Cabanillas F, Singh N, Kalinic Z, Carvajal E (2021) Examining the determinants of continuance intention to use and the moderating effect of the gender and age of users of NFC mobile payments: A multi-analytical approach. Inf Technol Manage 22(2):133–161

Lo PS, Dwivedi YK, Tan GWH, Ooi KB, Aw ECX, Metri B (2022) Why do consumers buy impulsively during live streaming? A deep learning-based dual-stage SEM-ANN analysis. J Bus Res 147:325–337

Najmi A, Kanapathy K, Aziz AA (2021) Exploring consumer participation in environment management: Findings from two-staged structural equation modelling-artificial neural network approach. Corp Soc Responsib Environ Manag 28(1):184–195

Ng FZX, Yap HY, Tan GWH, Lo PS, Ooi KB (2022) Fashion shopping on the go: A Dual-stage predictive-analytics SEM-ANN analysis on usage behaviour, experience response and cross-category usage. J Retail Consum Serv 65:1–15

Ooi KB, Tan GWH (2016) Mobile technology acceptance model: An investigation using mobile users to explore smartphone credit card. Expert Syst Appl 59:33–46

Ooi KB, Lee VH, Tan GWH, Hew TS, Hew JJ (2018) Cloud computing in manufacturing: The next industrial revolution in Malaysia? Expert Syst Appl 93:376–394

Priyadarshinee P, Raut RD, Jha MK, Gardas BB (2017) Understanding and predicting the determinants of cloud computing adoption: A two staged hybrid SEM-Neural networks approach. Comput Hum Behav 76:341–362

Raut RD, Mangla SK, Narwane VS, Gardas BB, Priyadarshinee P, Narkhede BE (2019) Linking big data analytics and operational sustainability practices for sustainable business management. J Clean Prod 224:10–24

Raut RD, Priyadarshinee P, Gardas BB, Jha MK (2018a) Analyzing the factors influencing cloud computing adoption using three stage hybrid SEM-ANN-ISM (SEANIS) approach. Technol Forecast Soc Chang 134:98–123

Raut R, Priyadarshinee P, Gardas BB, Narkhede BE, & Nehete R (2018b) The incident effects of supply chain and cloud computing integration on the business performance: An integrated SEM-ANN approach. Benchmarking: Int J.

Ray A, Bala PK, Rana NP (2021) Exploring the drivers of customers' brand attitudes of online travel agency services: A text-mining based approach. J Bus Res 128:391–404

Sarstedt M, Hair JF, Pick M, Liengaard BD, Radomir L, Ringle CM (2022) Progress in partial least squares structural equation modeling use in marketing research in the last decade. Psychol Mark 39(5):1035–1064

Sarstedt M, Ringle CM, Henseler J, Hair JF (2014) On the emancipation of PLS-SEM: A commentary on Rigdon (2012). Long Range Plan 47(3):154–160

Shahzad F, Xiu G, Khan MAS, Shahbaz M (2020) Predicting the adoption of a mobile government security response system from the user's perspective: An application of the artificial neural network approach. Technol Soc 62:101278

Sharma SK, Sharma M (2019) Examining the role of trust and quality dimensions in the actual usage of mobile banking services: An empirical investigation. Int J Inf Manage 44:65–75

Sharma SK, Al- A, Rana NP, Al- L (2018) Mobile applications in government services (mG-App) from user's perspectives: A predictive modelling approach. Gov Inf Q 35(4):557–568

Sharma SK, Joshi A, Sharma H (2016) A multi-analytical approach to predict the Facebook usage in higher education. Comput Hum Behav 55:340–353

Shukla S (2021) M-learning adoption of management students': A case of India. Educ Inf Technol 26(1):279–310

Sila I, Walczak S (2017) Universal versus contextual effects on TQM: A triangulation study using neural networks. Production Planning & Control 28(5):367–386

Sternad S, Kalinic Z, Bobek S, Tominc P (2019) SEM–ANN based research of factors' impact on extended use of ERP systems. CEJOR 27(3):703–735

Talukder MS, Sorwar G, Bao Y, Ahmed JU, Palash MAS (2020) Predicting antecedents of wearable healthcare technology acceptance by elderly: A combined SEM-Neural Network approach. Technol Forecast Soc Chang 150:119793

Talwar M, Talwar S, Kaur P, Tripathy N, Dhir A (2021) Has financial attitude impacted the trading activity of retail investors during the COVID-19 pandemic? J Retail Consum Serv 58:102341

Tewari A, Mathur S, Srivastava S, Gangwar D (2022) Examining the role of receptivity to green communication, altruism and openness to change on young consumers' intention to purchase green apparel: A multi-analytical approach. J Retail Consum Serv 66:1–14

Wang G, Tan GWH, Yuan Y, Ooi KB, Dwivedi YK (2022) Revisiting TAM2 in behavioral targeting advertising: A deep learning-based dual-stage SEM-ANN analysis. Technol Forecast Soc Chang 175:1–15

Wong LW, Leong LY, Hew JJ, Tan GWH, Ooi KB (2020) Time to seize the digital evolution: Adoption of blockchain in operations and supply chain management among Malaysian SMEs. Int J Inf Manage 52:101997

Dr. Marcos Ferasso holds a Bachelor's degree in Management and Specialization in Business Management from Universidade do Oeste de Santa Catarina (Brazil), International Specialization in Local development from International Labour Organization–United Nations (Italy). Prof. Ferasso holds a M.Sc. degree in Management from Federal University of Rio Grande do Sul with an international exchange period at Euromed-Marseille Business School in Marseilles (France) and holds a Ph.D. in Management from Federal University of Parana (Brazil) with exchange period at Forsyth Technical Community College (USA). Prof. Ferasso concluded his first Postdoctorate research experience at Meridional Faculty (Brazil) with an international exchange period at KEDGE Business School (France), and concluded a second Postdoctorate research experience at KEDGE Business School (France). Prof. Ferasso started his third Postdoctoral research experience at Università degli Studi di Padova (Italy) in 2022. Currently, Prof. Ferasso is Assistant Professor at Universidade Autónoma de Lisboa (Portugal) and Invited Professor at Wroclaw University of Economics and Business (Poland).

Dr. Alhamzah Alnoor is professional administrator with ten years of experience in organizational studies, social commerce, internship programs, multi-criteria decision analysis, Leadership and Innovation, strategic planning, and technology acceptance models. Successfully achieved several projects during my career with impactful business values. Creative, flexible, and motivated with active optimism and belief in diversity and inclusion. He is a reviewer for many journals. He published many papers in different and high-impact journals. He is a Senior Lecturer at the

Southern Technical University, Management Technical College. He received his MBA from the University of Basrah, Iraq. He received his Ph.D. from the School of Management, Universiti Sains Malaysia, Malaysia.