The Effect of App Quality and Compatibility on Consumers' Omnichannel (OC) App Adoption and Loyalty: Comparison of US and Korean Consumers

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Abstract. This paper proposes to empirically test a research model that evaluate the importance of selected antecedents of consumers' omnichannel shopping loyalty. In particular, this paper examines the influence of two variables (i.e. compatibility, omnichannel app quality) in understanding consumers' response to omnichannel retail service. Social cognitive theory and technology task fit theory are applied as theoretical frameworks, and the Technology Acceptance Model (TAM) is applied as a reference framework for the empirical research model. The proposed model is assessed with the partial least squares structural equation modeling (PLS-SEM), and the empirical data is collected from the U.S. and Korea. A web-based survey was developed to collect data from the U.S. and South Korean consumers who have experience using the OC apps. In total, 130 responses and 123 responses were used from the U.S. and South Korea, respectively for empirical analysis. This study finds the significant direct relationship of the 5 predictors (perceived quality of the OC app, perceived compatibility, perceived ease of use, perceived usefulness) with the key construct – consumer loyalty.

Keywords: Perceived quality of the OC app · Perceived compatibility · TAM · Loyalty

1 Introduction

One of the top priorities for change and innovation in the retail industry today is to enrich the customer experience by expanding resources and capabilities to develop an effective omnichannel strategy, while moving away from traditional channel and communication approaches for the new digital environment. Major retail firms around the world are adopting the digital transformation (omnichannel) to enhance customer experience by organically linking various customer contact channels (i.e. touch point) with customers, replacing the existing corporate-led and single store-oriented channel strategies. In particular, the retail firms are increasingly utilizing the mobile app to connect customers with their omnichannel services. For example, Wal-Mart has completely reorganized its mobile apps and websites to connect online and offline and enhanced its lifestyle-based

customer buying experience. The mobile app has revamped the in-store maps to facilitate customers' shopping in offline stores, and to track product and inventory. In addition, Wal-Mart introduced the Mobile Express Returns program to enhance customers' convenience, which enables the returns of online purchases at the offline Wal-Mart stores. Other major retailers such as Macy's and Amazon Go are strengthening their omnichannel services by offering a mobile check-out service (Fig. 1).
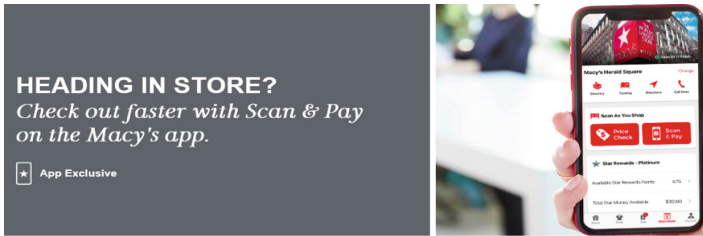

Fig. 1. Mobile check-out service

Thus, the omnichannel app with a mobile device is becoming an important platform which enables the digital transformation of major retail firms, connecting customers with their omnichannel services efficiently. There are numerous ways which retailers can apply the mobile app to the omnichannel service format. For example, the retailers can use a mobile app for a location-based services to offer consumers discounts or rewards opportunities when they physically enter offline stores or use their mobile cameras to scan the product's barcode. The omnichannel service app can also offer a shopping guide tool to assist their purchase decision, by connecting the mobile app with the consumers. Consumers are becoming sophisticated enough to optimize their shopping experience, with thorough consideration of all possible alternatives in all possible channels (Gao and Su 2017). Consumers use the in-store mobile apps to browse and look for products, deals, coupons, and other promotional offers as well as to purchase products after researching them in the store (Kang et al. 2015). The mobile retail apps can assist customers and significantly improve in-store conversions and keep consumers from being influenced by retail competitors (Siwicki 2014).

As consumers' omnichannel usage increases, the retailers need to know the underlying factors that affect consumers' use of omnichannel apps in order to enhance consumers' shopping experience, impact loyalty, and develop effective consumer-preferred apps and targeted marketing techniques. Perceived quality is an attribute of a product/service that indicates how well it makes consumer's needs (Nagel and Cilliers 1990). Perceived quality resembles attitudes (Zeithaml 1988) and affects purchases, as consumers reflect judgments and evaluations about the quality of products/services according to their needs. Consumers' perceived quality of the OC app may have significant effect on their future intention to use the omnichannel retail service (i.e. loyalty) which will translate to the customer retention rate.

This paper proposes to empirically test a research model that evaluate the importance of selected antecedents of consumers' omnichannel shopping loyalty. In particular, this paper examines the influence of two variables (i.e. compatibility, omnichannel

app quality) that have been rarely studied in understanding consumers' response to omnichannel retail service. Social cognitive theory and technology task fit theory are applied as theoretical frameworks, and the Technology Acceptance Model (TAM) is applied as a reference framework (Fig. 2) for the empirical research model. The proposed model is assessed with the partial least squares structural equation modeling (PLS-SEM), and the empirical data is collected from the U.S. and Korea.

2 Literature Review and Model Development

2.1 Perceived Quality of Omnichannel (OC) App

The omnichannel (OC) app may play an important role in facilitating retailers' OC service to consumers. When consumers purchase a product in the OC platform, they are likely to compare the OC app or the site quality of alternative services. Therefore, how consumers perceive the app quality can play a key role in retaining consumers. Consumers may use the OC app to access product information and to make purchase process, and the quality of the OC app is closely connected to consumers' shopping experience. In other words, the OC app needs to fulfil two functional aspects of the OC service, providing information and assisting the purchase process.

Information is a fundamental part of the website and the quality of information is considered to be important part of a marketing tool that ensures smooth execution of transactions in online shopping (Xu and Koronios 2005). One of the biggest challenges in the OC environment is to effectively communicate information (Bell et al. 2014). Because consumers are actively looking for information about product value and inventory availability, retailers may need to manage their sources of information to influence their shopping paths (Gao and Su 2017). In addition, retailers need to provide consumers with consistent and integrated information to facilitate adoption and use of omnichannel (Park and Kim 2018). The information quality may play a similar role in the OC app as an important marketing tool for the OC retailers. Kim and Niehm (2009) found that perceived information quality was positively associated with loyalty intention, supporting findings of previous research (e.g., Parasuraman and Grewal 2000; Chiu et al. 2005). Lin and Lu (2000) found a positive link between the quality of information and the usefulness of a website. In this study, the perceived information quality refers to consumers' overall judgment and evaluation of the quality of information, which is assessed by the degree of accuracy, timeliness of the information which are provided by the OC app.

Li et al. (2018) conceptualized that consumers averseness toward risk or uncertainties as important determinants of consumer's shopping behaviour. Thus, the OC app also need to entail an efficient system quality, ensuring privacy and guarantee for the OC product/service. This feature of the OC app is a proxy for consumers' trust in the OC, which was found to be essential in successful acceptance of the OC by consumers regardless of their individual differences (Park and Kim 2019). In this study, the system quality refers to customer's perception of protection mechanisms, such as online credit card guarantees and privacy protection that exists to protect consumers against potential risks in the OC environment. Perceived quality of the OC app can be

conceptualized as a composite of two dimensions such as the information quality and the system quality, having impact on consumers' perceived usefulness of the OC service and their loyalty toward a retailer.

> H1. Perceived quality of the OC app has a positive effect on perceived usefulness of the OC retailers.
>
> H2. Perceived quality of the OC app has a positive effect on consumer's loyalty towards the OC retailers.

2.2 Perceived Compatibility

Compatibility is the degree to which an innovation is perceived to be consistent with the potential users' existing values, previous experiences, and needs (Rogers 1995). In the literature on diffusion of innovation, compatibility has traditionally been regarded as a fundamental attribute of new behaviour or technology. According to the Technology Task Fit Theory, technology is important for users' compatibility with existing values and beliefs, previously introduced ideas and needs (Gillenson and Sherrell 2002; Ozturk et al. 2016). We define compatibility as the degree to which the OC technology fits the lifestyle and experiences of individuals. Compatibility is a key factor for consumers' attitude towards online shopping (Gillenson and Sherrell 2002), affecting consumers' behavioural intention for a mobile shopping, and has effects on both perceived usefulness, and actual use (Wu and Wang 2005). Compatibility is also considered to be important in users' mobile device activities (Koenig-Lewis et al. 2010). Ewe et al. (2015) states that in order to increase the usage of mobile banking, a mobile banking system needs to be easy to use and is compatible with users' lifestyles. According to Akturan and Tezcan (2012), compatibility is a key precursor of perceived ease of use.

Compatibility of mobile OC retail apps can be defined as the degree to which consumers view using apps as fitting in with their needs and preferences. Kim et al. (2009) demonstrated that value compatibility, such as the preferred lifestyle, had an impact on the intention to adopt a mobile service, and Meuter et al. (2005) found that compatibility was a determinant of consumer readiness and trial of self-service technologies (e.g., telephone banking, automated hotel checkout). Yang et al. (2016) has suggested that perceived compatibility of wearable devices should be one of the key determinants of perceived usefulness. Likewise, consumers may develop more positive perception (i.e. perceived usefulness and ease of use) toward the OC app, as they have higher levels of compatibility, which refers to the degree to which the OC app is perceived to be consistent with their beliefs, lifestyle, existing values, experience, and current needs

> H3. Perceived compatibility has a positive effect on perceived usefulness of the OC retailers.
>
> H4. Perceived compatibility has a positive effect on perceived ease of use with the OC retailers.
>
> H5. Perceived compatibility has a positive effect on consumer's loyalty towards the OC retailers.

2.3 TAM Variables

Technology acceptance model (TAM) integrates various theoretical perspectives of social psychological research framework (i.e. theory of reasoned action (TRA) and theory of planned behaviour (TPB) with technical approaches. TAM is widely known for its simplicity and parsimony (Dutot et al. 2019), and has been applied and validated for a wide range of new technologies such as e-commerce, m-gaming, smartphones and mobile-based technology (Dutot et al. 2019). TAM (Davis 1989) proposes two main predictors (i.e. perceived usefulness and perceived ease of use) of the acceptance and use of a new information system or technology. Davis (1989) defined the 'ease of use' as the degree to which he believes the use of a particular system requires no effort. According to Ozturk et al. (2014), perceived ease of use has a positive impact on the intention to use smartphone apps.

Use of new technologies or devices typically requires consumers to have additional learning efforts, and this may increase if the new technology is difficult to use. When consumers perceive the OC app to be not easy to use, they are likely to be discouraged from adoption and continued usage. Consumers may expect an enhanced shopping experience if the OC app is perceived to be easy to use. In this study, we adopted Davis's (1989) definition and defined the perceived ease of use as the degree that individuals consider the OC apps to be easy to use. Particularly, the effect of perceived ease of use on perceived usefulness has been established in the initial TAM (Davis et al. 1989) and re-established in TAM2 (Venkatesh and Davis 2000). In addition, this link has been found to be important in several contexts, including m-commerce (Cyr et al. 2006) and mobile app adoption (Kumar et al. 2018). If a consumer perceives that an app is easier to use, it is more likely that he/she will consider it to be useful (Kumar et al. 2018).

Loyalty is conceptualized as customers' favourable attitude towards a brand (Keller 1993) or an intention for a repeat usage. Loyal customers show their attachment and commitment to a company and are not interested in competitors' offerings (So et al. 2013; Ozturk et al. 2016). Firms can develop a long-term and mutually beneficial relationships with their customers if they can create loyalty (Pan et al. 2012). The term e-loyalty is defined as consumer's intention to revisit a website or repurchase from an online vendor (Flavián et al. 2006). In the context of e-commerce, the mobile loyalty depends on consumers' intention to revisit a mobile website resulting in repeat purchasing behaviour (Cyr et al. 2006). Numerous previous studies have shown that positive perceived ease of use and usefulness can generate loyalty for particular websites in the context of online retailing (Gefen et al. 2003; Ribbink et al. 2004; Flavián et al. 2006; Kim and Niehm 2009; Ozturk et al. 2016). Consumers' assessment of the service usefulness is one of the main determinants for its future use (Venkatesh and Davis 2000). The perceived usefulness also positively influences loyalty for mobile commerce (Cyr et al. 2006). A similar relationship has been established between the perceived usefulness and the loyalty for a retailer in e-services context (Cyr et al. 2006). Hence, this study proposes the following hypotheses.

H6. Perceived ease of use has a positive effect on perceived usefulness of the OC app.

H7. Perceived usefulness has a positive effect on consumer's loyalty toward the OC retailers.

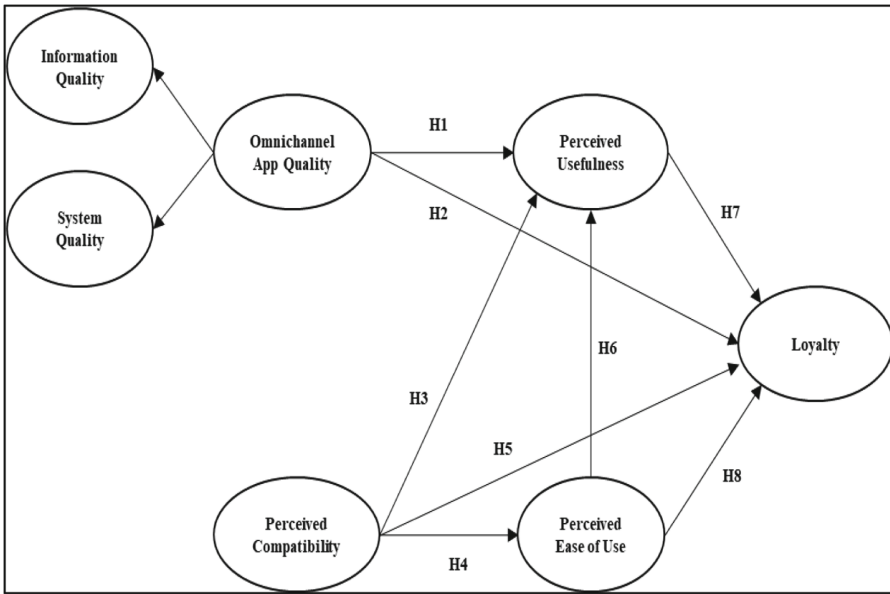H8. Perceived ease of use has a positive effect on consumer's loyalty toward the OC retailers.

Fig. 2. Conceptual model.

3   Research Methodology

A web-based survey was developed to collect data from consumers who have experience using the OC apps. The questionnaire consisted of two parts. The first section includes sample demographics (gender, age, education, occupation and income) and the second section consists of 18 items to measure the selected variables, using a Likert-5 scale (strongly disagree to strongly agree). Appendix A offers a detailed list of the 18 items. The data collection was performed in the U.S. and South Korea by a third party that has a large number of panels on an online survey platform. After the survey link had been distributed to the panel members, data screening revealed that 143 responses from the U.S. and 139 from South Korea had been obtained. Thirteen responses from the U.S. and 16 responses from South Korea were excluded, and in total, 130 responses and 123 responses were used for further analysis from the U.S. and South Korea, respectively. The majority of the South Korea participants were in their twenties and thirties, and 35 percent of them were male and 80 percent were female. Among U.S. participants, the numbers of male and female respondents were almost

equal, and the majority of U.S. participants were in their twenties and thirties. Table 1 provides more details on socio-demographic characteristics.

Table 1. Demographic characteristics

Variable	Group	U.S.		Korea	
		Frequency	Percent	Frequency	Percent
Age	10 s	12	9.2	29	23.6
	20 s	85	65.4	72	58.5
	30 s	26	20.0	17	13.8
	40 s	3	2.3	5	4.1
	50 s over	4	3.1	0	0
	Total	130	100.0	123	100.0
Gender	Male	67	51.5	121	50.6
	Female	63	48.5	118	49.4
	Total	130	100.0	239	100.0
Education	Less than 12th grade	2	1.5	3	2.4
	High school diploma	25	19.2	22	17.9
	Vocational degree	3	2.3	19	15.4
	Bachelor's degree	39	30.0	58	47.2
	Master's degree and above	61	46.9	21	17.1
	Total	130	100.0	123	100.0
Income	<$2,000	86	66.2	87	70.7
	$2,001–$3,5000	25	19.2	23	18.7
	$3,501–$5,000	4	3.1	5	4.1
	$5,001–$6,5000	3	2.3	1	0.8
	>$6,501	12	9.2	5.7	0
	Total	130	100.0	123	100.0
Occupation	Student	80	61.5	83	67.5
	Government official	3	2.3	4	3.3
	Professions	21	16.2	12	9.8
	Unemployed	1	0.8	0	0
	Office worker	13	10.0	9	7.3
	Self-employed	3	2.3	2	1.6
	Service workers	1	0.8	2	1.6
	Other	8	6.2	11	8.9
	Total	130	100.0	123	100.0

4 Data Analysis and Results

Partial least squares-Structural equation modelling (PLS-SEM) was used to test the proposed research model. PLS-SEM provides researchers with more flexibility in terms of data requirements, model complexity and relationship specification (Sarstedt et al. 2014). The statistical software used in this study is Smart-PLS (v 3.2.8).

4.1 Reliability and Validity of the Model

To assess construct reliability, Cronbach's alpha (Cronbach 1951) was computed. Nunnally (1994) suggested that a value of at least 0.70 indicates adequate reliability. Cronbach's α value of our finding showed a value between 0.749 and 0.900 (USA) and between 0.753 and 0.895 (Korea) in all items exceeding recommended thresholds.

If composite reliability (CR) is more than 0.7, internal consistency reliability is secured, and average variance extracted (AVE) is more than 0.5, the measurement model has convergent validity (Fornell and Larcker 1981). Findings show that the CR is greater than 0.7, the AVE is greater than 0.5, and the square root of AVE is greater than the correlation coefficient. Thus, construct validity is ensured, and the measurement model has convergent validity and discriminant validity (Tables 2 and 3). According to Hair et al. (2014), the cut-off value for VIF (collinearity) should be smaller than 0.5, and our VIF results were smaller than 0.5 (from 1.379 to 4.048) as shown in Table 4.

Table 2. Construct reliability and validity

Measures	USA			Korea		
	Cronbach's alpha	Composite reliability	Average Variance Extracted (AVE)	Cronbach's alpha	Composite reliability	Average Variance Extracted (AVE)
IQ	0.869	0.919	0.792	0.842	0.905	0.760
LY	0.844	0.906	0.763	0.866	0.918	0.789
PC	0.848	0.908	0.766	0.753	0.858	0.669
PE	0.872	0.921	0.796	0.853	0.911	0.773
OQ	0.853	0.892	0.584	0.860	0.896	0.591
PU	0.900	0.937	0.833	0.895	0.935	0.827
SQ	0.749	0.856	0.665	0.791	0.878	0.706

Information Quality: IQ, Perceived Compatibility: PC, Perceived Ease of Use: PE, Omnichannel App Quality: OQ, Perceived Usefulness: PU, System Quality: SQ, Loyalty: LY

Table 3. Discriminant validity

USA	IQ	LY	PC	PE	OQ	PU	SQ
IQ	0.89						
LY	0.746	0.874					
PC	0.684	0.766	0.875				
PE	0.254	0.309	0.383	0.892			
OQ	0.918	0.793	0.725	0.405	0.764		
PU	0.704	0.788	0.757	0.458	0.783	0.913	
SQ	0.605	0.668	0.607	0.495	0.871	0.697	0.815
Korea	IQ	LY	PC	PE	OQ	PU	SQ
IQ	0.872						
LY	0.677	0.888					
PC	0.678	0.761	0.818				
PE	0.396	0.381	0.301	0.879			
OQ	0.906	0.762	0.727	0.423	0.769		
PU	0.699	0.788	0.667	0.458	0.771	0.909	
SQ	0.613	0.691	0.626	0.361	0.889	0.683	0.84

Information Quality: IQ, Perceived Compatibility: PC, Perceived Ease of Use: PE, Omnichannel App Quality: OQ, Perceived Usefulness: PU, System Quality: SQ, Loyalty: LY

Table 4. Collinearity (VIF)

USA				Korea			
Items	VIF	Items	VIF	Items	VIF	Items	VIF
LY1	2.400	PE1	2.662	LY1	2.269	PE1	2.386
LY2	1.673	PE2	2.052	LY2	2.053	PE2	1.954
LY3	2.536	PE3	2.480	LY3	2.700	PE3	2.096
IQ1	2.368	PU1	4.085	IQ1	1.998	PU1	3.081
IQ1	2.451	PU2	2.076	IQ1	2.146	PU2	2.238
IQ2	2.089	PU3	4.551	IQ2	1.869	PU3	3.467
IQ2	2.657	SQ1	1.651	IQ2	2.239	SQ1	2.167
IQ3	2.462	SQ1	2.276	IQ3	2.589	SQ1	2.477
IQ3	2.508	SQ2	1.379	IQ3	2.787	SQ2	1.740
PC1	2.111	SQ2	1.445	PC1	1.446	SQ2	2.021
PC2	1.883	SQ3	1.562	PC2	1.583	SQ3	1.543
PC3	2.302	SQ3	1.652	PC3	1.526	SQ3	1.653

Information Quality: IQ, Perceived Compatibility: PC, Perceived Ease of Use: PE, Omnichannel App Quality: OQ, Perceived Usefulness: PU, System Quality: SQ, Loyalty: LY

4.2   Hypothesis Testing

To identify the direct and indirect relationships among the constructs, t-values and beta-coefficients have been calculated using Smart-PLS at 95% confidence interval level. These values are shown in Table 5. This study finds the significant direct relationship of the 5 predictors (perceived quality of the OC app, perceived compatibility, perceived ease of use, perceived usefulness) with the key construct – consumer loyalty. H5 (perceived ease of use) is the only hypothesis which is not supported in both country cases. The 'perceived quality of the OC app' construct had direct impact on two constructs (i.e. perceived usefulness and loyalty) in both countries. The 'perceived compatibility' construct has a significant direct relationship with three constructs - 'perceived usefulness', 'perceived ease of use' and 'loyalty' in both countries. Although 'perceived ease of use' shows an insignificant direct relationship with 'loyalty', it does impact 'perceived usefulness' significantly.

Table 5. PLS-SEM results

	Variables	Path coefficients	T statistics (|O/STDEV|)	P values	Remarks
USA					
H1	OQ->PU	0.459	5.75	0.000	Supported
H2	OQ->LY	0.369	4.472	0.000	Supported
H3	PC->PU	0.375	4.743	0.000	Supported
H4	PC->PE	0.383	5.178	0.000	Supported
H5	PC->LY	0.292	3.284	0.001	Supported
H6	PE->PU	0.128	2.161	0.031	Supported
H7	PU->LY	0.324	3.451	0.001	Supported
H8	PE->LY	−0.1	1.752	0.080	Not supported
	OQ->IQ	0.918	68.633	0.000	Second-order
	OQ->SQ	0.871	39.56	0.000	Second-order
Korea					
H1	OQ->PU	0.535	6.631	0.000	Supported
H2	OQ->LY	0.197	2.072	0.039	Supported
H3	PC->PU	0.229	2.637	0.009	Supported
H4	PC->PE	0.301	3.085	0.002	Supported
H5	PC->LY	0.348	4.168	0.000	Supported
H6	PE->PU	0.163	2.814	0.005	Supported
H7	PU->LY	0.401	4.921	0.000	Supported
H8	PE->LY	0.009	0.16	0.873	Not supported
	OQ->IQ	0.906	51.317	0.000	Second-order
	OQ->SQ	0.889	36.616	0.000	Second-order

Information Quality: IQ, Perceived Compatibility: PC, Perceived Ease of Use: PE, Omnichannel App Quality: OQ, Perceived Usefulness: PU, System Quality: SQ, Loyalty: LY

5   Discussion and Implications

This study identifies the key determinants of loyalty towards the OC retailers and explains the relationships among perceived quality of the OC app, perceived compatibility and perceived usefulness and perceived ease of use. The empirical results confirm most of the hypothesized relationships among the selected constructs. These results show that customers' loyalty to the OC retailers can be strengthened by effectively communicating usefulness and ease of use of the OC apps, and the marketing communication may need to emphasize the quality of the OC apps and compatibility of the OC apps with consumers. While, all hypothesized relationships were significantly positive both in the U.S. and Korea findings, but contrary to our predictions, the construct –'perceived ease of use' shows no significant effect on 'loyalty'. However, 'perceived ease of use' has a positive effect on 'perceived usefulness', suggesting an indirect effect on 'loyalty' through 'perceived usefulness'. Findings suggest that the path of 'perceived quality of the OC app' (OQ)-> 'perceived usefulness' (PU)-> 'loyalty' (LY) is the most influential in both countries. More specifically, 'perceived quality of the OC app' (OQ) and 'perceived compatibility' (PC) constructs show significant effects on 'loyalty' (LY) in the U.S. case. In the Korean case, 'perceived compatibility' (PC) has a relatively greater impact on 'loyalty' (LY).

5.1   Theoretical Implications

Recent research and reports have shown that it is important to understand the omnichannel business from the customer's viewpoint and it is becoming to pay more attention to consumers' perception of the OC usage and experience. This study contributes to a new research flow in the following aspects. First, the study identifies the key determinants of omnichannel loyalty, and meaningful secondary factors which affect the perceived quality of the OC app. In addition, we developed a an empirical research model of consumers' behavior toward the OC app from technology perspectives of the Technology Task Fit Theory and TAM, and future research may adopt this approach for further analysis of predecessors and results, in expanding the existing literature. Recent studies have shown that customers are increasingly looking for an integrated shopping that reflects a variety of channel choices, continuous touch-points, and lifestyles (Shi et al. 2020), which is considered as the driving force of the omnichannel development (Brynjolfsson et al. 2013). However, previous studies show little attention to the importance of compatibility and the omnichannel app quality, which can be considered as the main links between customers and the omnichannel retailers. This study enhances understanding of consumers in a technology-intensive and dynamic omnichannel environment by addressing the unique characteristics of evolving omnichannel retail platform and consumer needs.

5.2   Managerial Implications

This study provides insights to practitioners in the omnichannel business and provide insightful guidelines for successful OC strategies. Omnichannel retailers should strive to improve the quality of the OC app to strengthen customer loyalty. In doing so, the OC retailers may need to invest substantial resources in developing a reliable OC system which can build consumer trust, and strives to provide accurate and timely information through the OC app. In particular, integration and consistency among channels are important to improve information quality which are provided to consumers (Park and Kim 2019). This require the OC retailers to ensure that customers can access consistent information through apps and receive consistent responses across channels. The OC retailers need to ensure privacy and credit safety of the system, and may provide customized services such as personal recommendation and promotion by analyzing big-data about customer information, data and shopping records. These functional features of the OC app can effectively enhance consumers experience of the OC app, translating into their loyalty toward the OC retailer.

Concurrently, the OC retailers must recognize the importance of consumers' perceived compatibility. In other words, they need to effectively communicate how the OC service, including the OC app can facilitate consumers' needs and preferences. This may require the retailers to look at consumers in more holistic way, paying attention to changes in consumer shopping habits, lifestyles, and preferences to have better understanding of consumers' needs and preference. As customer expectation rapidly change with technology development (augmented reality, smart devices), retailers should continue to update consumer needs and preferences. Many OC retailers are also providing additional incentives to consumers who uses the OC apps in their purchasing process, in order to draw more consumers to their OC system.

6   Limitations and Future Research

There are some limitations to this study. the survey questionnaire may need to be expanded to explore the relationships among the constructs (i.e. loyalty, perceived ease of use, perceived usefulness, perceived compatibility and omnichannel app quality) more in-depth. This study did not assess the effects of the demographic backgrounds of the omnichannel consumers on the hypotheses, and further analysis may provide more detailed information on antecedents of the OC loyalty for different consumer segments. Future research may apply other theoretical frameworks, such as the Unified Acceptance and Technology Use (UTAUT) model, to investigate the antecedents of omnichannel loyalty.

Appendix A

Information Quality	Omnichannel app offers necessary information about products that I need	Gao and Su (2017); Beck and Rygl (2015); Shin et al. (2013)
	Omnichannel app offers variety of information in a useful format	
	Omnichannel app provides much information that helps me with purchasing decision	
System Quality	I think omnichannel app provides very reliable service	Fang et al. (2014); Gao and Su (2017); Shin et al. (2013)
	I think that omnichannel app is secure to use	
	I think that omnichannel app provides fast responses to my inquiries	
Perceived Compatibility	I would appreciate using omnichannel app instead of alternative modes to find the information	Kapoor et al. (2015); Gillenson and Sherrell (2002); Ozturk et al. (2016); Sánchez-Prieto et al. (2019)
	Using omnichannel app is completely compatible with my current situation	
	Using omnichannel app fits my lifestyle	
Perceived Ease of Use	It would be easy for me to become skillful at using omnichannel app	Davis (1989); Kumar et al. (2018); Cyr et al. (2006)
	I would find omnichannel app easy to use	
	Learning to use omnichannel app would be easy for me	
Perceived Usefulness	I evaluate omnichannel app as useful	Davis (1989); Kumar et al. (2018); Cyr et al. (2006)
	I evaluate omnichannel app as functional	
	I evaluate omnichannel app as effective	
Loyalty	Using omnichannel app is a good idea	Cyr et al. (2006); Kumar et al. (2018); Floh and Treiblmaier (2006); Zhang et al. (2011)
	I think omnichannel app would make my life more interesting	
	I intend to recommend others use omnichannel app	

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