

Exploring social networking sites for facilitating multi-channel retailing

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Abstract This study aims to explore how social networking sites (SNS) can be used to influence consumer behavior in the context of multi-channel retailing. A research framework with ten hypotheses was proposed to study important relationships between various consumer behaviors related to trust on physical stores, access to SNS fan pages, physical-store purchase, online information search, and online purchase. An empirical test was conducted by using PLS, a second-generation multivariate analysis tool, to analyze survey data collected from 205 SNS users. Our findings revealed that consumers' intention to online information search would significantly influence their intention to online purchase. Trust on physical stores would affect consumers' attitudes toward not only purchasing at physical-store but also joining retailers' SNS fan pages. In addition, attitude toward joining SNS fan pages was found to affect consumers' intention to online information search and physical-store purchasing. Moreover, consumers' physical-store purchasing would also affect their intention to related online information search. Based on the validated research model and corresponding findings, retail managers are suggested to use SNS fan pages to enhance consumers' purchase at physical stores and information search on their online stores, thus increasing overall sales. Retail managers should build and maintain consumer trust on their stores, since such trust significantly affects consumers' attitude to access SNS fan pages.

Keywords Social networking sites (SNS) · Multi-channel retailing · Electronic commerce · Partial least squares (PLS)

1 Introduction

The Internet can be used efficiently and ubiquitously to distribute information to and collect feedback from customers interactively, irrespective of geographical distance, and therefore

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many traditional retailing stores are utilizing the Internet as another channel to promote products, increase sales volume, and serve their customers' needs [40, 57]. Such "cyber-enhanced retailing" and "click-and-mortar" approaches to providing complete product information and related services online can not only reduce the customers' search costs but increase customers' interest in browsing online retail stores [12]. Cyber-enhanced retail websites can provide expanded accessibility, timely updated content, and novel experience to customers, and click-and-mortar e-commerce can increase the value for current and new customers in various market segments [12].

Actually, retailers with both physical and online stores have more opportunities to reach potential consumers by combining physical channels and the Web channel to build a competitive business model that increases business revenues [12, 44]. It was mentioned that a multi-channel strategy could be employed by retailers to make merchandises available to their customers through more than one distribution channels, and such multi-channel retailers can utilize the online channel to offer a wider range of business functionalities and to expand their market shares in various geographical, time, and product-related terms [9, 50]. Multi-channel retailing (MCR) can help retailers meet the expectations of the future customers whilst delivering profitability and growth, and therefore retailers who adopt a multi-channel strategy would have advantages over those who do not adopt it [1, 56]. It is suggested by Forrester Research that e-business firms should utilize a multi-channel strategy to increase sales volume and merchandise exposure by running business with both offline and online channels [16]. It is reported that consumer shopping behavior in MCR context is a highly important issue influencing the sales of click-and-mortar retailers, thus deserving more attention from scholars and practitioners [12].

Social networking sites (SNS) have become popular with online users mainly because SNS are based on user-generated contents and possess powerful functions to help users to interact with their families, friends, and even strange people on the Internet [6, 33]. People perceive enjoyment, pleasure and fun while sharing their current status, feelings, and opinions via SNS, and this habit is becoming a lifestyle for many users who believe that the use of SNS has been integrated into their daily activities [33]. Many statistical results have shown that the number of SNS users is increasing steadily in recent years [33], and not surprisingly, social media, particularly SNS, have been increasingly used by advertisers for conducting interactive digital advertising and communicating with consumers [7]. Being one of the most influential social media affecting our daily life, SNS is considered by this study for investigating how SNS, particularly the use of SNS fan pages, would affect consumer shopping behavior in MCR context. Specifically, the overall objectives of this research include: (1) to investigate customers' acceptance toward SNS when retailers intend to build and use SNS for promoting their products and services, (2) to find out whether SNS can benefit retailers in MCR context, and (3) to understand how SNS can be integrated into MCR strategies to help click-and-mortar retailing stores achieve their goals of enhancing their sales and marketing performance in today's fast-changing and highly competitive business environment.

2 Research background

2.1 Web 2.0

Many Internet-based companies closed in early 2000s, but some companies continued to grow and the business model of the Internet industry changed in this period. The phrase "Web 2.0"

was uttered by Tim O'Reilly in 2004 to describe the common features of various Web companies that survived the “dot-com burst” in early 2000s [59]. Web 2.0 can be viewed as a set of economic, social, and technology trends that collectively form the basis for a relatively more mature and distinctive medium characterized by user participation, openness, and network effects [41]. Caused by moving to the Internet as platform, Web 2.0 allows users to become not only content consumers but also content contributors. Promoting collaborations among users, Web 2.0 thrives on network effects: databases that get richer the more people interact with them, and applications that become smarter the more people use them [41].

During the past few years the Web trend has shifted towards Web 2.0 services, such as blogs, social networking sites, and online video-sharing platforms. The core spirit of Web 2.0 is about sharing information and cooperation between all participants in the cyber world. In other words, online users on the Internet were information receivers in the past, but now the Web 2.0 has allowed them to be the information creators, commentators and reviewers [15]. In this study, Web 2.0 has a great important impact as now consumers retrieve information from the Internet more often before they purchase. They will be amazed when they find that retailing stores are also ready to serve them online, via either an online stores or a virtual community. This study is conducted under the context of Web 2.0 as the target is to reach respondents who have been using the Internet to create and share information.

2.2 User generated content

The content of traditional websites are created, monitored, and maintained by the website companies/operators or their delegates (such as webmasters or administrators), but in the era of Web 2.0 the concept of user generated content (UGC), which reflects to a new web-publishing paradigm allowing online users to actively participate in creating and sharing web content, is expanding the media production through new technologies accessible and affordable to the ordinary users [31]. While UGC platforms on the Internet are commonly shown as wiki, blogs, video sharing sites, and online virtual communities, supporting such UGC platforms is considered as a powerful and useful way to help companies study their consumers' insights and collect feedbacks, and it requires a longer-term approach instead of short surveying methods [53]. Indeed, collecting feedbacks from customer communities may help companies gain customer insight, boost brand loyalty, build brand awareness, increase sales and reduce costs [51]. UGC can be used by companies to design products matching consumers' dynamic needs (particularly for those fast-moving consumer goods), and it can be exemplified by the case of Unilever that effectively built a Marmite XO product brand by using customer feedbacks collected from social media [14]. UGC created by consumers online can offer retailers precious ideas on products design, packaging, services, and even the way they manage physical stores. For consumers, they are no longer passive receivers of product information, and instead, they become active information creators. Furthermore, many online users are also specialists who can help to filter and fix incorrect information.

2.3 Social networking sites

Emerging with the advent of Web 2.0, social networking sites (SNS) are primarily built on collaboration and interaction by connecting users to reach more users and focusing on user-generated contents [13, 15]. Providing users valuable social tools and online features, SNS enable users to quickly create elaborate profiles and effectively build, maintain, and manage their own social networks. Generally, SNS users create the content by themselves and decide what specifically they want to share with their close friends and/or the general public [29]. Users

not just personally utilize SNS (e.g., Facebook, Twitter, MySpace, Plurk, etc.) to stay in touch with friends, families and colleagues for social purpose, but commercially use SNS to connect to existing members and even to reach potential customers [6, 33, 42]. Typical SNS usually provide essential features including instant messaging, grouping, networking, and blogging. Thousands of the applications and social plug-ins are also well-developed and available to SNS (e.g., Facebook) users for sharing interests, holding activities, posting events, and managing social relationships within their individual networks. By using SNS, users can get benefits such as enhanced quality of collaboration and interaction, increased convenience of communication, and improved productivity [4]. Indeed, values provided by SNS have attracted the attention from academic and business perspectives [42]. Among hundreds of SNS available to users, Facebook is deemed so far the largest global online social community with more than 800 million active users and more than 900 million objects (including pages, groups, events and community pages) that people interact with all over the world [4, 58].

2.4 Facebook fan pages

Initially founded by Mark Zuckerberg in February 2004, Facebook has become one of the key SNS shaping the social, cultural, and business landscape [4, 58]. Facebook enables companies, organizations and even individuals to effectively build, maintain, and manage the relationships with their fans by providing them a timely and cost-effective marketing tool, Facebook fan pages, which can also be used to connect multiple social media and work as a social hub to help stimulate interaction in e-commerce context [51, 53, 58]. In addition, Facebook fan pages have been utilized in online marketing campaign context for business practitioner to create its brand community and reinforce the brand image [51]. For example, Starbucks uses Facebook fan pages to directly communicate with and collect feedbacks from its fans. So far, Starbucks has attracted more than 26 million fans on Facebook [54]. Some of those fans might not have the chance to walk into Starbucks shops to buy a cup of coffee, but they can still be targeted as potential customers and their suggestions or criticisms can still be valuable. It was argued that marketers should know where customers are and pay attention to the channels that customers are familiar with and prefer to use [45]. In addition, feedbacks from those customer communities can be valuable assets and may help companies gain customer insight, boost brand loyalty, build brand awareness, increase sales and reduce costs [30, 51].

3 Research model, hypotheses, and research method

Under the multi-channel retailing (MCR) environment, a traditional retailer can use the “*cyber-enhanced retailing*” approach and an online shop can conduct “*click-and-mortar*” e-commerce strategy, to increase the value for current and new customers in various market segments [12]. In addition to launching a website and offering services to meet consumers’ online information search and purchasing needs, retailers now have a new approach (i.e., using SNS) to conduct advertising and marketing campaigns at low cost. Specifically, this study aims to exploring how social networking sites (e.g., Facebook fan pages) can be used to influence consumer behavior under the context of multi-channel retailing.

3.1 Trust

Consumers’ perceived trust has been confirmed as a critical factor for running and managing successful business, and it is a basis of establishing a successful long-term customer relationship

[43]. Defined as “a willingness to rely on an exchange partner in whom one has confidence” [38], trust has been identified as a key driver in prior studies of e-commerce and technology acceptance [21, 36]. Trust represents a state of psychology based on a positive expectancy for other people’s behavior or intention [49]. In relational marketing research, trust is defined as the perception of confidence in the exchange of partner’s reliability and integrity [39]. Trust represents a kind of perceptions from human psychological perspective and has key characteristics associated with vulnerability, uncertainty, and risk [11]. Trust usually plays an important role whenever people perceive risks and uncertainty from other people and their behaviors [25]. In the situation of lacking trust, consumers would intend to have less interaction with service providers [20, 21]. Trust, which helps reduce social uncertainty and risk, is a vital element in virtual contexts, and it can be learned from social interaction and considered as a positive predictor for other people’s intention and behavior [21, 46]. An individual’s intention to adopt a service would be significantly influenced by his/her perceived trust on the service provider [20, 46]. Typically, trust arises from a firm’s physical proximity, history of successful prior transactions, and legal restrictions motivating appropriate business conduct [3]. In this study, trust is defined as the extent that customers believe that the store can be relied on.

3.2 Trust and attitude toward purchasing at physical-store

According to Theory of Reasoned Action (TRA), beliefs would directly affect attitude [18]. A consumer’s trust on a retailer might positively impact the consumer’s attitudes toward the retailer’s physical stores [32], and further investigation particularly for various online extensions is highly recommended by prior research [32]. In the context of MCR, when a customer tends to trust a physical store, his/her willingness of buying from that store would be positively influenced. Therefore, it was expected in our research model that consumers’ trust on physical stores would directly and positively affect his/her attitude toward purchasing at physical stores. Consequently, our first hypothesis was postulated as follows.

H1: *There is a positive relationship between consumers’ trust on physical stores and attitude toward purchase at physical stores.*

3.3 Attitude toward joining Facebook fan pages

In addition to obtaining the product/service information announced by the retailers, consumers may want to show their loyalty by joining related customer communities (e.g., Facebook fan pages) [30, 51]. As suggested by prior research, loyalty was found to affect customer purchase behavior and increase sales volume [28, 37]. To show their passion for the specific brand/retailer, IKEA, some customers in Taiwan spontaneously set up a Facebook fan page (with 40,000 registered fans) to urge IKEA to consider opening a store in central Taiwan where the local people have been longing for an IKEA store [17]. Hence, in the context of MCR, it was expected in our research model that attitude toward joining Facebook fan pages would directly and positively affect consumers’ attitude toward purchasing at physical stores. Hypothesis H2 was hence postulated.

H2: *There is a positive relationship between consumers’ attitude toward joining retailers’ Facebook fans pages and attitude toward purchase at physical stores.*

Trust has been identified as an important factor significantly influencing consumers’ attitude toward accepting novel technologies [21, 36]. Recognized as a novel Web technology and

marketing tool used in the context of MCR, Facebook fan pages can help retailers build an effective communication channel with their customers [51, 53, 58]. Joining a retailer's fan pages enables a consumer to receive the most updated information (e.g., special promotions) and hear other consumers' voices including compliments, suggestions, criticisms, etc. However, consumers might also need to worry about their personal information being revealed from retailers' fan pages. In terms of using fan pages in the ubiquitous computing environment, retailers are able to collect sensitive information (such as friend lists, location coordinates, communication histories, preferences, etc.) from consumers. Consequently, trust was regarded as a highly important construct in our research for investigating consumers' attitude to joining Facebook fan pages. Accordingly, Hypothesis H3 was posited.

H3: There is a positive relationship between consumers' trust on the retailers' physical stores and consumers' attitude toward joining the retailers' Facebook fans pages.

3.4 Intention to online information search

Trust is a confident belief that the salesman can be relied upon to behave in such a manner that the long-term interest of the customer will be served [10]. Consumers used to search for product information and place the order at the physical store when they visit the retailer. When online shopping was first introduced, most consumers felt unsafe and risky due to the perceived risks of conducting online payment, and therefore consumers would prefer to place the order via the traditional channels where they can get consultations and make an inquiry to salesperson [47]. People might tend to search the product/service information online when they trust the physical stores where they may feel safe and reliable. Therefore, Hypothesis H4 was postulated as follows.

H4: There is a positive relationship between consumers' trust on physical stores and intention to online information search.

In addition, when consumers have purchase intention in mind at the physical stores, they might tend to search the product/service information online. To explore the relationships between physical-store purchase intention and online information search intention in the context of MCR, Hypothesis H5 was postulated as follows.

H5: There is a positive relationship between consumers' attitude toward purchasing at physical stores and intention to online information search.

Social media (such as SNS) is a group of Internet-based applications built on the ideological and technological foundations of Web 2.0, emphasizing the creation and exchange of user generated contents [27]. Effectively and widely interacting with its fans, an SNS fan page can be virtually viewed as a social actor officially representing a brand, company, or organization on SNS. Based on the broadcast nature and the core spirits of Web 2.0, the key social feature, Facebook fan page, on SNS becomes an ideal platform for implementing information sharing, cooperation, and collaboration. Similar to the mechanism in Really Simple Syndication (RSS) technology which automatically sends the most updated information to its subscribers, a Facebook fan page delivers the timely updated contents created and shared by the fans to all fans [29, 41]. Shared contents such as users' comments and experiences on specific products/services are valuable and can be referenced by other consumers interested in such products/services [4, 42]. Therefore, it is possible for consumers to be attracted by the contents (e.g., new product announcement, promotions, etc.)

delivered by Facebook fan pages, fostering consumers' intention to do online information search. Accordingly, Hypothesis H6 was posited.

H6: *There is a positive relationship between consumers' attitude toward joining Facebook fans pages and intention to online information search.*

3.5 Intention to online purchase

With previous shopping experiences at the physical stores, consumers may have accumulated reasonable understanding about the retailer and incline to adopt online purchasing. Consumers who have built trust in a physical store would feel confident of shopping at the corresponding online store, and such confidence would in turn affect consumers' purchase intention toward the online store [23]. This implied that consumers who have purchase experiences at a click-and-mortar retailer's physical store might be willing to use its new retail channel, Internet shopping site, for shopping purpose [32]. Since it is plausible that consumers' attitude toward purchasing at physical stores would have positive impact on intention to purchase online, Hypothesis H7 was derived.

H7: *There is a positive relationship between consumers' attitude toward purchasing at physical stores and intention to online purchase.*

Intention to use the Internet to search for information has been suggested as a predictor of Internet purchase intention [52]. It was also argued in prior empirical research that there would be a higher possibility for consumers to search more product information online when they intend to do online merchandise purchase [32]. Before doing online shopping, consumers may want to search for product information directly via the retailer's website, instead of visiting the physical stores in person all the time. Online information search can reduce consumers' search cost, and direct online purchase largely cuts down consumers' transaction cost. Consequently, it was expected in our research model that intention to online information search would directly and positively affect consumers' intention toward online purchase in the context of MCR. Hypothesis H8 was therefore posited.

H8: *There is a positive relationship between consumers' intention to online information search and intention to online purchase.*

A customer's trust on a store has positive influence on his/her attitude toward the store. Lacking in confidence on a retailer, consumers would hardly place orders, whether shopping offline or online [20]. When consumers believe in a retailer, it would decrease the perceived risk in related online transactions [24]. In addition, it was found that consumers' trust on an off-line bank would influence the extent of use of the bank's online system [34]. Based on the aforementioned study results, it was expected in our study that when consumers have trust on physical stores, they would have relatively more intention to purchase online. Consequently, Hypothesis H9 was postulated.

H9: *There is a positive relationship between consumers' trust on physical stores and intention to online purchase.*

Utilized as an advertising and marketing tool by a click-and-mortar retailer, a Facebook fan page can provide various types of information (including discussion messages, videos and

photos, event and promotion messages, etc.) to all its “fans” [51, 53, 58]. By joining a retailer’s Facebook fan page, consumers can directly communicate with other fans and receive valuable information from fan groups [4, 42]. Therefore, in the SNS-involved context of MCR, we propose that consumers’ attitude toward joining Facebook fan pages might positively affect their intention to online purchase. Hence, Hypothesis H10 was postulated as follows.

H10: *There is a positive relationship between consumers’ attitude toward joining Facebook fan pages and intention to online purchase.*

3.6 Research framework, questionnaire, and sampling procedures

According to the relationships between the important constructs described above, a research framework for exploring how SNS influence consumers’ behavior in the context of MCR was constructed and shown in Fig. 1 Based on the research framework and the postulated hypotheses, a questionnaire was developed as the survey instrument to validate the measurement model and test the structural model.

Empirical data were collected through an online survey of using questionnaire. Two major channels were used to invite respondents to participate in the study and fill in the questionnaire. The first main channel was under Facebook community where respondents all have been Facebook memberships, and the other channel was through the discussion board about Facebook in the biggest electronic bulletin board system (BBS) in Taiwan. The questionnaire was developed from an integrated process referencing the results from literature review and the research framework. The derived questionnaire items (which are shown in Table 1) were used in this study to conduct our survey. The questionnaire showed a brief instruction to the respondents and asked them to focus on their favorite traditional retailers operating both physical stores and online stores. Our approach was modified from the similar method used by Lee and Kim (2008) [35]. Respondents were asked to answer all survey questions based on their past shopping experience with the retailer that they had chosen.

A print screen picture of Facebook fans page, established by Books.com.tw, was attached as an example to help respondents acquire better understanding about Facebook fan pages. Except for the demographic related questions, the questionnaire items were measured using a five-point

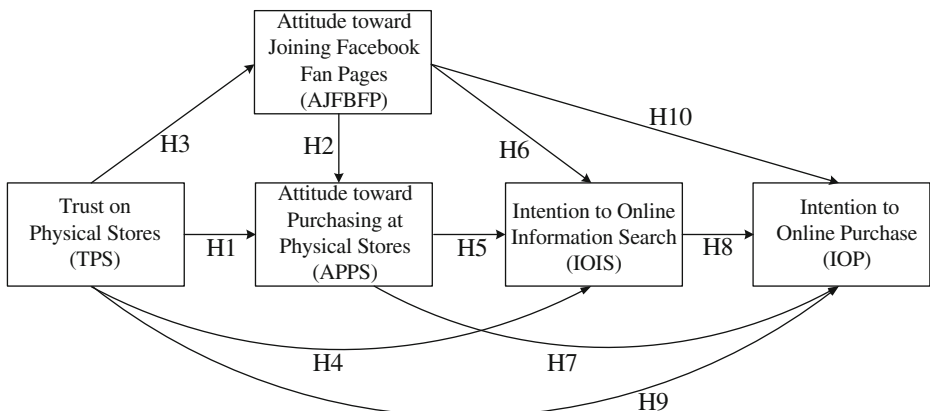


Fig. 1 Research framework

Likert scale, ranging from “strongly disagree (1)” to “strongly agree (5)”. To ensure that the items could be understood and measured validly, a pretest was conducted in a small group. Based on the comments received from the pretest and the findings derived from pretest results, modifications were made to the items before they were used in the formal survey.

Partial least squares (PLS), a second-generation multivariate analysis technique which has been gaining interest and increasing popularity among researchers in recent years, is suggested as a powerful path modeling tool which requires minimum restrictions on measure scales and sample size, i.e., it can be used to model latent constructs under conditions of nonnormality and small to medium sample sizes [8, 55]. The second-generation multivariate analysis tool, SmartPLS 2.0.M3 [48], was used in this study to analyze collected samples and test the measurement model. It is important to assess the accuracy of the measurement model (i.e., the outer model which connects the manifest variables to the latent variables) in terms of the

Table 1 Questionnaire items

Trust on Physical Stores (TPS):

- TPS1 I feel confident about the ability of this physical store in meeting consumers’ needs.
 TPS2 I think the store has a well supply of merchandise.
 TPS3 I feel safe when I purchase at this physical store.
 TPS4 I think this physical store is trustworthy.
 TPS5 I believe the service of this physical store would fit my expectation.

Attitude toward Purchasing at Physical Stores (APPS):

- APPS1 Overall, I predict I would come back to this physical store constantly.
 APPS2 I predict I would spend more time purchasing at this physical store than I expected.
 APPS3 I think it is quite possible for me to purchase at this physical store.
 APPS4 In general, I am willing to buy what I need at this physical store.
 APPS5 Overall, I am willing to recommend this physical store to my friends.

Attitude toward Joining Facebook Fan Pages (AJFBFP):

- AJFBFP1 I plan to join Facebook fan pages so I can know more about the store.
 AJFBFP2 I tend to join the Facebook fan page of the store to know what other people are discussing.
 AJFBFP3 I tend to join the Facebook fan page of the store to acquire information on after sale services.
 AJFBFP4 I would be interested in joining the Facebook fan page of the store if they have one.
 AJFBFP5 I would consider joining the Facebook fan page of the store if I got useful consultation at the physical store before.

Intention to Online Information Search (IOIS):

- IOIS1 I will be willing to search for product/service information through retailers’ online stores.
 IOIS2 I tend to do online information search via retailers’ online stores for product/service information.
 IOIS3 I tend to do online information search via retailers’ online stores for product promotions.
 IOIS4 I tend to do online information search via retailers’ online stores for consumers’ discussions on products.
 IOIS5 I tend to do online information search via retailers’ online stores for consumers’ feedbacks and comments.

Intention to Online Purchase (IOP):

- IOP1 Overall, I am willing to buy from this retailer’s online store.
 IOP2 I think it is quite possible for me to conduct online purchase through retailers’ online stores.
 IOP3 Overall, I predict I would come back to this online store constantly.
 IOP4 Overall, I am willing to recommend this online store to my friends.

individual item reliability, construct reliability, convergent and discriminant validity of the variables in the model. Following the suggestions from Tenenhaus et al. (2005) [55], a check for unidimensionality of each block in the proposed model was conducted before applying PLS analysis on the collected data and the proposed structure model.

4 Empirical analysis and results

4.1 Descriptive statistics

After a total of 245 respondents were gathered, invalid and incomplete survey results were identified and discarded. Overall, 205 usable copies of questionnaire were collected and used for analysis. Among 205 usable respondents, 111 (54.1 %) were male and 94 (45.9 %) were female. Accounting for 99 %, the respondents' ages mainly fell on the range between 15 and 45 years old, matching the main group of Facebook users in Taiwan [5]. Our demographic analysis results also show that 174 (84.9 %) of the respondents have joined Facebook as a member for more than half a year. As for the experience in using the Internet, 201 respondents (98 %) have been surfing the Internet for more than 3 years, and nearly half of the respondents (49.8 %) claimed that they had experience with online shopping for more than ten times. In terms of educational level, 57 (27.8 %) of them were at the postgraduate level, and 144 (70.2 %) have college degrees.

There are three tools available to check the unidimensionality of a block: principal component analysis of the block, Cronbach's alpha (α), and Dillon-Goldstein's rho (ρ) [55]. From principal component analysis, a block of manifest variables is unidimensional if the first eigenvalue of the correlation matrix of the block is greater than 1 and the second eigenvalue is less than 1, or at least very far from the first one. Alternatively, a block is considered as unidimensional when its Cronbach's alpha value and Dillon-Goldstein's rho (ρ) are larger than 0.7 [55]. As shown in Table 2, the statistics for this check satisfied the aforementioned standards. Therefore, it was concluded that the unidimensionality of all blocks is supported by the test results from all three tools.

4.2 Test of the measurement model (outer model): convergent validity and discriminant validity checks

The outer model estimation results, including outer weight, loadings, and the average variance extracted (AVE) measures, are listed in Table 3. The outer loadings, which represent the loadings of the reflective manifest variables with their respective latent variable, can be used to assess individual item reliability, and it is considered by many researchers as acceptable when an item has a loading higher than 0.7. In this study, except for one item (IOIS2), all outer loadings were higher than 0.7. The exception item was still retained in the subsequent analyses, mainly because it is important to retain as many items as possible from the original scale to preserve the integrity of the test [2], and its loading (0.690) was very close to 0.7.

The average variance extracted (AVE) measures can be used to assess the convergent validity of the reflective constructs. As shown in Table 3, all AVE scores in this study ranged from 0.581 to 0.669, passing the threshold value of 0.5 suggested by [19]. To assess the discriminant validity, the square root of the AVE measure on each construct must exceed the estimated correlations shared between the construct and other constructs in the model [19]. As shown in Table 4, the discriminant validity for the constructs used in our study was

Table 2 The statistics for checking the unidimensionality of all blocks

Latent variable	First eigenvalue	Second eigenvalue	Cronbach's α	Dillon-Goldstein's ρ
TPS	3.344	.606	.875	.910
APPS	3.003	.851	.832	.881
AJFBFP	2.974	.791	.828	.879
IOIS	2.936	.764	.822	.876
IOP	2.327	.682	.760	.847

TPS trust on physical stores; *APPS* attitude toward purchasing at physical stores; *AJFBFP* attitude toward joining facebook fan pages; *IOIS* intention to online information search; *IOP* intention to online purchase

acceptable, since the square root of AVE on each construct was greater than the correlations of the construct with other constructs.

The matrix of loadings and cross-loading for all indicators is shown in Table 5, which shows that all reflective items have high loadings on their expected constructs and every item loads higher on its theoretical construct than on other constructs. Although cross-loadings derived from PLS procedure will be inevitably higher than those derived from

Table 3 The results from the outer model estimation (weight, loadings, and AVE)

Latent variable	Manifest variable	Outer weight	Loadings	AVE
Trust on Physical Stores (TPS)	TPS 1	0.2309	0.7386	0.669
	TPS 2	0.2535	0.8101	
	TPS 3	0.2588	0.8473	
	TPS 4	0.2517	0.8655	
	TPS 5	0.2277	0.8209	
Attitude toward Purchasing at Physical Stores (APPS)	APPS 1	0.2249	0.7416	0.597
	APPS 2	0.2198	0.7765	
	APPS 3	0.2661	0.8297	
	APPS 4	0.2861	0.7322	
	APPS 5	0.2980	0.7794	
Attitude toward Joining Facebook Fan Pages (AJFBFP)	AJFBFP 1	0.2613	0.8171	0.594
	AJFBFP 2	0.2701	0.7088	
	AJFBFP 3	0.2735	0.7754	
	AJFBFP 4	0.2506	0.7897	
	AJFBFP 5	0.2442	0.7581	
Intention to Online Information Search (IOIS)	IOIS 1	0.2612	0.7898	0.586
	IOIS 2	0.2743	0.6896	
	IOIS 3	0.2439	0.7296	
	IOIS 4	0.2524	0.7721	
	IOIS 5	0.2764	0.8386	
Intention to Online Purchase (IOP)	IOP 1	0.3128	0.7365	0.581
	IOP 2	0.2894	0.7445	
	IOP 3	0.3694	0.8151	
	IOP 4	0.3374	0.7502	

Table 4 Inter-construct correlations and square root of AVE measure

	TPS	APPS	AJFBFP	IOIS	IOP
TPS	0.818				
APPS	0.442	0.773			
AJFBFP	0.389	0.561	0.771		
IOIS	0.409	0.629	0.607	0.766	
IOP	0.433	0.574	0.552	0.666	0.762

TPS trust on physical stores; APPS attitude toward purchasing at physical stores; AJFBFP attitude toward joining facebook fan pages; IOIS intention to online information search; IOP intention to online purchase

exploratory factor analysis [22], in our study every cross-loading difference (i.e., the difference between the loading of each item on its expected construct and the loading of the item on any other construct) is higher than the threshold of 0.1 suggested by prior research [22, 26]. Thus, it is concluded that Table 5 provides additional evidence of convergent validity and discriminant validity.

4.3 PLS path modeling results: structural model (inner model)

After the outer model was validated, the inner model which specified the relationships between latent variables was then estimated. The path coefficients for the endogenous latent variables and R-square statistics were derived. The inner model results are presented in Fig. 2 and Table 6.

Our empirical results (Fig. 2 and Table 6) confirm that *trust on physical stores* significantly and positively affects consumers' attitude toward not only purchasing at physical stores ($\beta=0.264$, $p=0.0112$) but also joining retailers' Facebook fan pages ($\beta=0.389$, $p=0.0001$). However, *trust on physical stores* affects neither consumers' intention to online information search ($\beta=0.102$, $p=0.3020$) nor consumers' intention to online purchase ($\beta=0.128$, $p=0.1400$). *Attitude toward joining Facebook fan pages* was found to significantly and positively affects consumers' intention to online information search ($\beta=0.350$, $p=0.0032$) and attitude toward physical-store purchasing ($\beta=0.459$, $p<0.0001$), but it does not have significant influence on consumer's intention to online purchase ($\beta=0.157$, $p=0.1541$). Moreover, consumers' *attitude toward purchasing at physical stores* also significantly and positively affects their intention to online information search ($\beta=0.387$, $p=0.0022$), but it does not significantly influence their intention to online purchase ($\beta=0.172$, $p=0.1170$). Last but not least, consumers' intention to online information search significantly and positively their intention to online purchase ($\beta=0.410$, $p=0.0009$). Overall, hypotheses H1, H2, H3, H5, H6, and H8 postulated in this study were supported by the empirical results, though the other 4 hypotheses (H4, H7, H9 and H10) were not supported.

5 Discussion

Motivated by the needs to have better understanding about how social networking sites (SNS) can be used to influence consumer behavior in the context of multi-channel retailing, this study proposed a research framework, collected empirical data from 205 SNS users, and used PLS to analyze the data and validate the framework. Our empirical study results revealed several findings. Firstly, the results suggest that trust on physical stores is an

Table 5 Matrix of loadings and cross-loadings

Latent variable	Item	TPS	APPS	AJFBFP	IOIS	IOP
TPS	TPS 1	0.739	0.344	0.364	0.324	0.264
	TPS 2	0.810	0.408	0.351	0.318	0.337
	TPS 3	0.847	0.362	0.317	0.369	0.395
	TPS 4	0.865	0.337	0.302	0.363	0.403
	TPS 5	0.821	0.354	0.254	0.294	0.364
APPS	APPS 1	0.224	0.742	0.391	0.396	0.415
	APPS 2	0.261	0.777	0.396	0.374	0.389
	APPS 3	0.293	0.830	0.400	0.486	0.511
	APPS 4	0.443	0.732	0.490	0.542	0.421
	APPS 5	0.435	0.779	0.468	0.581	0.466
AJFBFP	AJFBFP 1	0.338	0.417	0.817	0.476	0.408
	AJFBFP 2	0.258	0.462	0.709	0.535	0.407
	AJFBFP 3	0.352	0.474	0.775	0.476	0.415
	AJFBFP 4	0.271	0.413	0.790	0.423	0.453
	AJFBFP 5	0.274	0.387	0.758	0.418	0.443
IOIS	IOIS 1	0.310	0.489	0.458	0.790	0.504
	IOIS 2	0.242	0.579	0.461	0.690	0.513
	IOIS 3	0.331	0.436	0.453	0.730	0.462
	IOIS 4	0.312	0.425	0.432	0.772	0.518
	IOIS 5	0.370	0.466	0.513	0.839	0.542
IOP	IOP 1	0.330	0.361	0.402	0.499	0.736
	IOP 2	0.194	0.401	0.416	0.452	0.744
	IOP 3	0.390	0.465	0.456	0.580	0.815
	IOP 4	0.383	0.513	0.406	0.488	0.750

TPS trust on physical stores; *APPS* attitude toward purchasing at physical stores; *AJFBFP* attitude toward joining facebook fan pages; *IOIS* intention to online information search; *IOP* intention to online purchase

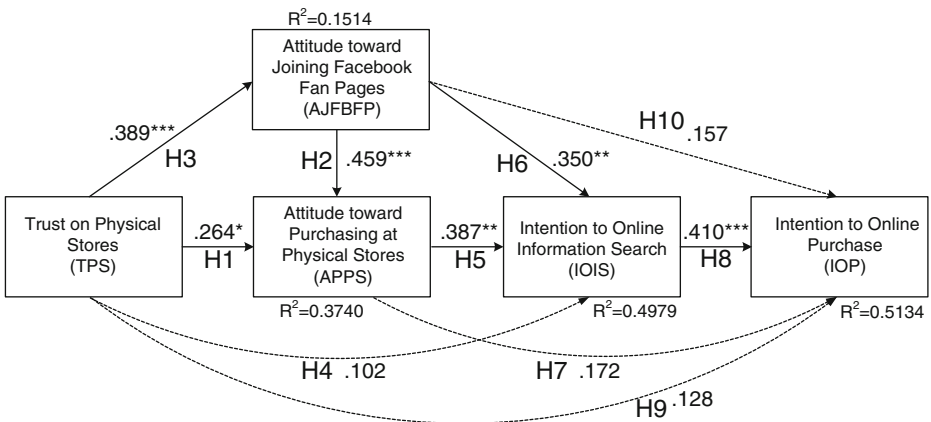


Fig. 2 Empirical study results

Table 6 Structural model results

H ₀	Hypothesis	Path coefficient	P-value	Hypothesis test result
TPS → APPS	H1	0.264*	0.0112	supported
AJFBFP → APPS	H2	0.459***	0.0000	supported
TPS → AJFBFP	H3	0.389***	0.0001	supported
TPS → IOIS	H4	0.102	0.3020	not supported
APPS → IOIS	H5	0.387**	0.0022	supported
AJFBFP → IOIS	H6	0.350**	0.0032	supported
APPS → IOP	H7	0.172	0.1170	not supported
IOIS → IOP	H8	0.410***	0.0009	supported
TPS → IOP	H9	0.128	0.1400	not supported
AJFBFP → IOP	H10	0.157	0.1541	not supported

(1) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$;

(2) *TPS* trust on physical stores; *APPS* attitude toward purchasing at physical stores; *AJFBFP* attitude toward joining facebook fan pages; *IOIS* intention to online information search; *IOP* intention to online purchase

important factor affecting consumers' attitude toward not only purchasing at physical stores but also joining retailers' SNS fan pages. For retailers, consumers' trust can be considered as the basis of initiating a mutually benefited relationship with their customers. With trust, consumers may feel safe and tend to purchase at physical stores and join retailers' SNS fan pages. Secondly, attitude toward joining SNS fan pages was found to directly affect consumers' physical-store purchasing and online information search. These important findings suggest that when consumers are interested in joining the SNS fan page of the retailer, it is more likely for them to purchase at the physical stores and do online search for product information. Through the positive impact on intention to online information search, consumers' attitude toward joining SNS fan pages would have indirect effect on their intention to online purchase. Therefore, retailers are suggested to establish their own SNS fan pages to assist sales and increase profit through both off-line and online sales channels. Thirdly, a consumer's intention to online information search is positively influenced by his or her attitude toward purchasing at physical stores. Based on the results, consumers who have more trust on the retailer and intend to purchase merchandises at the physical stores may feel more interested in browsing the online stores and conduct online purchasing activities. Furthermore, a consumer's intention to online information search positively affects his/her intention to online purchase, and this is consistent with the results of prior research [32, 52]. This indicates that the more product information acquired by the consumer, the higher possibility that he/she would conduct online transaction. Retailers are suggested to reduce the search cost for their potential customers who come to the shopping website or online stores by providing as much information as possible.

According to our empirical study results, four hypotheses (i.e., H4, H7, H9, & H10) were found unsupported in this study. The results revealed that consumers' trust on physical stores does not have direct significant effect on the intention to online information search. Customers may not tend to do online information search simply because they have trust on physical stores. Under the SNS-involved multi-channel retailing (MCR) context, consumers who have trust on the retailers tend to join SNS fan pages to obtain timely updated product information instead of directly conducting online information search. In addition, trust on physical stores is not significantly associated with consumers' intention to online purchase. Although consumers have trust on physical stores, online purchase might make them feel unsafe and risky. Thus, they

tend not to do any online transaction before doing online search first. For some types of products such as real estate and coffee, people tend to buy at physical stores when they have trust on the retailers. Moreover, it is suggested that attitude toward purchasing at physical stores does not significantly affect consumers' intention to online purchase. This implies that consumers who have purchase intention at physical stores may not buy products directly online without conducting online information search activities in advance. Before gathering details on products, consumers may hesitate to place any order from the online store, even though they may have had trust on the physical stores. Furthermore, joining SNS fan pages does not have direct impact on consumers' intention to online purchase. Although SNS fan pages are capable of providing rich and the most updated product information to its fans, consumers would not buy it directly from retailers' Websites without further information search. Information search intention plays an important role in triggering consumer's online purchase intention, and this is consistent with the results of prior studies [23, 32, 52].

5.1 Implications

Our study results provide several implications and strategic recommendations for managers and store operators who are running retailing business in the context of MCR. Firstly, managers and store operators are suggested to build up SNS fan pages (e.g., setting up a Facebook fan page for conducting online marketing activities such as product/service promotion announcements) for supporting their online stores. In addition, retailers are suggested to adopt various features provided by SNS fan pages (e.g., Facebook check-in feature) and encourage their customers to check-in at their physical stores for bridging the marketing channels between retailers' physical stores and online stores. With the ability of creating virtual community and reinforcing retailers' brand images effectively [51], SNS fan pages were found by this study to have direct impact on off-line purchase intention and indirect impact on online purchase intention. Consumers who join SNS fans pages would be more willing to purchase off-line (at physical stores) and browse the Website for obtaining product information. Therefore, retail managers may use SNS fan pages to enhance consumers' purchase at physical stores and information search on online stores, thus increasing overall sales. Secondly, trust was confirmed in the study as a key factor to business success, consistent with the results from prior e-commerce research [21, 36]. Our study results revealed that trust significantly influences not only the acceptance of SNS fan pages but also the physical-store purchase intention. To enhance revenues, retailers may follow our research findings to build a strong and positive trust relationship with their consumers (e.g., maintaining a high standard of product/service quality, providing constructive purchase suggestions to their consumers, etc.). Thirdly, our findings indicate that information search is an essential process influencing online purchase. Consumers may not purchase online without any further information search process, even for those who are members of SNS fan pages. Retailers are suggested to enhance their Website (e.g., providing useful online features such as product comparison) to induce consumers' online purchase intention. Aforementioned implications together with the validated research model can be referenced by retailing store managers who are conducting multi-channel strategy and using the online platform as the electronic marketing tool to assist sales and increase profit.

5.2 Limitations and future research

Limitations exist in our study which is for exploring how social networking sites (SNS) can be used to influence consumer behavior in the context of multi-channel retailing. Firstly, the

respondents of our empirical study were collected by convenience sampling. As a matter of fact, most respondents were from the group with college or higher degrees, and they tended to be more familiar with information technology issues than the general consumer population. Future research may modify the sampling procedure and compare the findings with the results reported here. Secondly, all the analyzed data in this empirical study were collected from 205 respondents in Taiwan, and therefore, the results may not be applicable directly to other contexts since the culture and the technology deployment in various regions/countries may not be exactly the same. Thirdly, despite of many SNS available in the world, Facebook is adopted in the study because it is so far the largest global online social community and has more than 800 million active users [58]. It would be interesting to expand the study by including other SNS (e.g., Twitter, MySpace, LinkedIn, Plurk, etc.) for comparative studies. Also, the future study could be conducted under a more specific industry to examine this proposed model and is suggested to be evaluated in more countries where Facebook users reach considerable mass. More empirical studies to examine this new model will be essential, and it is suggested to investigate if Facebook fan pages will be a predominant factor to increasing consumers' re-purchases intention online.

6 Conclusion

This study explored how social networking sites (SNS) can be used to influence consumer behavior in the context of multi-channel retailing. A research model was proposed to study important relationships between various consumer behaviors related to *trust on physical stores*, *access to SNS fan pages*, *physical-store purchase*, *online information search*, and *online purchase*. The empirical findings show that: (1) trust on physical stores affects consumers' attitudes toward not only purchasing at physical-store but also joining retailers' SNS fan pages, (2) consumers' intention to online information search significantly influences their intention to online purchase, (3) attitude toward joining SNS fan pages affects consumers' intention to online information search and physical-store purchasing, and (4) consumers' physical-store purchasing also affects their intention to related online information search. The validated research model and corresponding findings can be referenced by retail managers for enhancing revenues from both physical and online channels.

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