Omnichannel Technology: IT Innovation in Indonesia Retail Industry

L. Lisnawati(✉) 🆔, R. Hurriyati 🆔, Disman 🆔, and V. Gaffar 🆔

Univeritas Pendidikan Indonesia, Bandung, Indonesia
lisnawati@upi.edu

Abstract. This study aims to determine the effect of Information Quality and This article desire to examine the appliance of omnichannel technology as an IT innovation in the Indonesian retail industry. Omnichannel technology integrates all communication and process of purchase channels, providing customers with a seamless and consistent experience across online and offline platforms. This study focuses on the impact of omnichannel technology on retail activity in Indonesia. The article examines the challenges faced by the Indonesian retail industry in adopting omnichannel technology, such as the poverty of IT infrastructure and the need for a proficient personnel. Furthermore, the article measures the adoption rate and implements omnichannel technology using the UTAUT 2 model to increase competitiveness and meet changing consumer needs in the digital era. This research contributes to the literature on IT innovation in the retail industry and provides practical insights for practitioners and policymakers in Indonesia.

Keywords: omnichannel technology · IT innovation · online-to-offline (O2O) business model · Indonesia retail industry

1 Introduction

The retail industry in Indonesia has encountered significant changes in recent years since the covid 19 pandemic due to the growth of e-commerce and the increasing use of technology in retail activity [1–5]. Indonesian consumers are becoming more tech-savvy and now more demanding seamless and integrated shopping experiences across online and offline channels [6]. This has led to the emergence of omnichannel technology as a solution to meet the changing consumer demands.

Omnichannel technology is an approach that integrates all communication and sales channels, providing customers with a seamless and consistent experience across online and offline platforms [7–9]. This enables retailers to offer their customers a personalized and convenient shopping experience, where they can browse and purchase products across multiple channels, such as websites, mobile apps, social media, and physical stores [10, 11].

Despite the benefits of omnichannel technology, the adoption of this approach in the Indonesian retail industry is still in its early stages. Many retailers in Indonesia still rely on conventional stores and have a limited online presence [12–18]. There is a lack of IT

infrastructure and a skilled workforce in the retail industry, which presents a significant challenge in the deployment of omnichannel technology.

Therefore, it is necessary to conduct research on the application of omnichannel technology in the Indonesian retail industry. This research will contribute to the literature on IT innovation in the retail industry and provide practical insights for practitioners and policy makers in Indonesia. This study aims to examine the impact of omnichannel technology on customer experience, supply chain management and retail operations in Indonesia, and propose recommendations for the Indonesian retail industry to adopt and implement omnichannel technology to increase their competitiveness in the digital era.

Omni-channel retail marketing is a fully integrated approach to e-commerce that provides online shoppers with a seamless, unified experience across online channels, i.e., smartphones, computers, e-stores, social media, e-wallets, e-delivery, etc. [19]. Omni-channel Consumers make a Purchases can be made using any combination of channels, such as physical stores, e-commerce, social media, websites and mobile apps. Critical customer segment creating from the development of omnichannel environment [20–24]. Consumers are more utilizing social media to explore, and learn about product knowledge. Social media is a key touchpoint of customer journey map contact because it is a part of customers' daily life that allows them to express their feelings about the buying experience meantime also concede businesses to access it [26–30]. Today, efficient social media use is critical for retailers since it helps to the development of value for the organization and function as a new hybrid component of the promotional mix [31–36]. As a result, social media activities must be connected with the economic goals and applications of the channel can serve as an efficient means of communication between channel and customers [37–40]. Retailers use social media to connection, notify and engage consumers through their omni-channel management strategy [41, 42].

Omni-channel retailing techniques can be distinguished by a number of characteristics, Product returns independent of purchasing channel (implying cross-channels) and full integration of customer-related data [22, 43]. Furthermore, an omni-channel approach enables customers to traverse among channels in each transaction depending on numerous order fulfillment mechanisms [44]. This necessitates the continuous flow of at least lot of channels, which is described as cross-channel [45].

Retail technology has a tremendous impact on the omnichannel retail process. It is not easy to provide an omnichannel buying experience. This necessitates investments in technology as well as organizational cultural and operational adjustments. A real omnichannel retailer provides a seamless shopping experience through a linked and cutting-edge platform, where customers don't care whether they purchase in-store or online. Retailers' physical businesses must combine in-store technology in order to provide a distinct consumer experience in addition to the benefits of internet buying. The website should also assist clients in increasing their product certainty and purchasing confidence. To complete a single transaction, consumers are increasingly shopping across various media. These two channels must be smoothly linked so that customers believe they are shopping in a single store. This is the way omnichannel retail will be in the future.

A client's emotive and cognitive responses to all stimuli in their purchase trip are captured by customer experience [46], It can be expressed through feeling and fulfillment

[47]. Furthermore, the consumer experience incorporates behavioral, sensory, and social reactions [48, 49]. Customer experience stems from customer connection and influences consumer engagement through satisfaction and emotion. This study claims that customer interactions can impact customer experience by combining what has been indicated by the theory underlying interpersonal connections and customer experience. The parts that follow will go into further detail on the relationship between variables. The complexity of customer interactions influences the customer experience since it allows businesses to engage with their consumers more effectively. A good client experience can lead to favorable results such as repurchase. Overall, the preliminary findings give empirical information that may be used to supplement the omnichannel retailing literature. It does, however, advocate for more study to deepen the understanding of customer interaction as an important aspect in the customer journey [50].

In recent years, the retail industry has undergone a transformation due to the increasing prevalence of digital technology. Omnichannel technology, a form of IT innovation, has emerged as a strategy for retailers to stay competitive in the digital age. Omnichannel technology refers to the integration of all communication and sales channels, providing customers with a seamless and consistent experience across online and offline platforms.

Studies have shown that omnichannel technology can have a significant impact on customer experience and retail operations. For example, a study by Verhoef et al. [19] found that companies that adopted omnichannel strategies experienced higher customer satisfaction, increased customer loyalty, and higher sales. Another study by Picco et al. [51] found that omnichannel technology can improve inventory management and reduce costs for retailers.

However, the adoption of omnichannel technology in the Indonesian retail industry has been slow due to various challenges. One of the challenges is the lack of IT infrastructure for technology readiness [52], which makes it difficult for retailers to implement omnichannel technology. Additionally, retailers in Indonesia may lack the resources and expertise to adopt and maintain the technology.

To address these challenges, various models and frameworks have been proposed for the adoption of omnichannel technology. For example, the Unified Theory of Acceptance and Use of Technology (UTAUT) model, developed by Venkatesh et al. [53–55]. It has been widely used to understand and predict the adoption of technology in various contexts.

In conclusion, the adoption of omnichannel technology is crucial for the success of retailers in the digital age. While the Indonesian retail industry faces challenges in adopting the technology, various models and frameworks can be used to facilitate its adoption. This literature review provides insights into the current state of research on omnichannel technology in the Indonesian retail industry and highlights the potential benefits and challenges associated with its adoption.

1.1 Problem Identity

Based on the research background above, the formulation of the problems to be studied and analyzed include:

a. How can a dependable omnichannel marketing system be developed in Indonesia's retail industry?

b. What is the adoption model for omnichannel behavior in Indonesia's retail industry?

1.2   Research Goal

The research objectives to be achieved based on the formulation of the identified problems are:

a. The challenges that hinder the adoption of omnichannel technology in the Indonesian retail industry, and provides recommendations for enhancing competitiveness and meeting the evolving consumer demands in the digital age.
b. To identify the factors that affect the adoption of omnichannel experience behaviors and investigate their impact on customer satisfaction.

2   Methods

The type of research that will be carried out in this research is descriptive and verification research. This descriptive research was conducted with the aim of providing an overview of how to build a reliable omnichannel marketing system in the retail industry in Indonesia. While the verification research was carried out using the Partial Least Square (PLS) equation using the UTAUT. Technology Acceptance model in conducting an analysis to test the omnichannel behavior adoption model in the retail industry in Indonesia. This verification research aims to examine the relationship or influence between acceptance of omnichannel technology in the retail industry in Indonesia. The population in this study were 200 respondents using online marketplace services in Indonesia who had used the service at least 3 times in the past year and were taken using a simple random sampling technique.

3   Results and Discussion

The majority of customers in Indonesia nowdays dawning to shop at retail stores that provide multi-channel choices and technology integration, as shown in Fig. 1. at the development stage of the omnichannel marketing system, a system consisting of various channels such as websites, mobile applications, physical stores, and social media has been successfully built. In addition, this system is also equipped with features such as a shopping cart that can be accessed from various channels, non-cash payments, and an integrated stock management system.

The results of this study indicate that the development of a reliable omnichannel marketing system can increase customer satisfaction and optimize retail business performance in Indonesia. Customers tend to prefer retail stores that provide multi-channel options and technology integration, as this provides flexibility and convenience when shopping.

In addition, the development of an omnichannel marketing system can help retail stores to optimize stock management and minimize the risk of excess or shortage of inventory. With an integrated stock management system, retail stores can track inventory in real-time and carry out restocking more effectively.
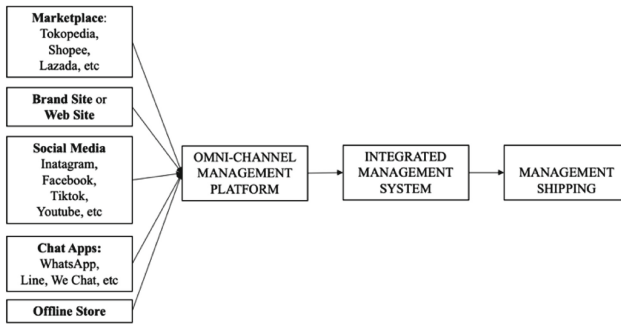
Fig. 1. Omnichannel Platforms Identification in Indonesia Retail Industry

However, there are still a number of challenges that need to be overcome in developing an omnichannel marketing system in Indonesia. One of them is the technological infrastructure, which is still uneven and can affect the speed and stability of the system. In addition, there are still some customers who tend to be skeptical of non-cash payments and still prefer cash payments.In conclusion, the development of an omnichannel marketing system can be a solution to improve retail business performance in Indonesia and meet increasingly diverse customer needs. However, it still needs to overcome some challenges in its development.

Base on the loading factor values for the performance expectation, effort expectation, social influence, facilitating condition, hedonic motivation, price value, habit, behavioral intention, and use behavior indicators of the PLS model, as seen in Table 1.

An indicator is considered valid if it has a correlation value above 0.70. However, for a loading value of 0.50 to 0.60 it is still acceptable by looking at the output correlation between the indicator and the construct. Based on Table 1, it can be seen that each indicator that forms the construct, both indicators on the variable performance expectation, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, habit, behavioral intention, and use behavior, already has a loading value above 0.7 so that the indicator can be said to be valid.

The statistics used in composite reliability or construct reliability are cronbachs alpha and D.G rho (PCA). Cronbachs alpha and D.G rho (PCA) values above 0.7 indicate that the construct has high reliability as a measuring tool. A limit value of 0.7 and above means acceptable and above 0.8 and 0.9 means very. The following is the composite reliability value in Table 2.

Based on the Table 2, it can be seen that the Cronbach Alpha value and the composite reliability value are fulfilled because the value is above. 0.7. So that the construct has high reliability as a measuring tool.

Average variance extracted (AVE) describes the amount of construct variance that can be explained by the items or indicators compared to the variance caused by measurement errors. Following are the results of convergent validity, which are explained through the average variance extracted (AVE) *in Table 3*.

Table 1. Initial model loading factor value

Indicator	PE	EE	SI	FC	HM	PV	Habit	BI	UB
PE1	0.908								
PE2	0.919								
PE3	0.912								
PE4	0.905								
EE1		0.907							
EE2		0.859							
EE3		0.822							
EE4		0.776							
SI1			0.845						
SI2			0.963						
SI3			0.971						
FC1				0.855					
FC2				0.846					
FC3				0.844					
FC4				0.813					
HM1					0.927				
HM2					0.951				
HM3					0.911				
PV1						0.757			
PV2						0.832			
PV3						0.768			
HAB1							0.787		
HAB2							0.821		
HAB3							0.921		
HAB4							0.932		
BI1								0.746	
BI2								0.859	
BI3								0.872	
UB1									0.984
UB2									0.827
UB3									0.764
UB4									0.814
UB5									0.838

Table 2. Composite reliability

	Cronbach Alpha	Composite Reliability
Performance Expectation	0.981	0.921
Effort Expectacy	0.915	0.974
Social Influence	0.970	0.975
Facilitating Condition	0.899	0.926
Hedonic Motivation	0.980	0.962
Price Value	0.872	0.927
Habit	0.912	0.938
Behavioral Intention	0.901	0.945
Use Behavior	0.950	0.970

Table 3. Convergent Validity

	AVE
Performance Expectation	0.829
Effort Expectacy	0.787
Social Influence	0.908
Facilitating Condition	0.739
Hedonic Motivation	0.863
Price Value	0.785
Habit	0.788
Behavioral Intention	0.828
Use Behavior	0.828

The Table 3 shows that the AVE value for each construct is fulfilled because it has a value above 0.5, which means that the construct is adequate to explain on average more than half of the indicator variants.

Base on Table 4 path coefficients describe the relationship between constructs. Fulfilled if the T-Statistics were obtained from the bootstrapping process (resampling method). The influence of each construct is presented in Table 5.

Table 5 explains that the path coefficient of facilitation conditions has the highest value compared to the others, this shows that behavioral intention is a major key for retail traders to pay more attention to the conditions of the omnichannel marketing facilities used, facilitating and reliable facility conditions will direct consumers to be able to Make purchases smoothly even with routine repeat purchases. While the effect of performance expectations is considered the lowest, this indicates that consumers do not have high expectations for omnichannel performance in the current retail industry in Indonesia.

Table 4. Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (lO/STDEVl)	PValue
Age → Behavioral Intention	0.470	0.465	0.147	3.198	0.000
HAB*Exp → Behavioral Intention	0.250	0.248	0.087	2.876	0.005
Effort Expectacy → Behavioral Intetion	0.314	0.311	0.109	2.872	0.005
Experience → Behavioral Intention	0.556	0.553	0.095	5.869	0.000
FC*Age → Behavioral Intention	0.766	0.764	0.056	13.79	0.000
FC* Gend → Behavioral Intention	0.473	0.476	0.074	6.428	0.000
FC*Exp → Behavioral Intention	0.141	0.440	0.265	1.876	0.064
Gender → Behavioral Intention	0.218	0.215	0.099	2.198	0.002
HAB * Age → Behavioral Intention	0.321	0.318	0.121	2.651	0.001
HAB * Gend → Behavioral Intention	0.548	0.542	0.176	3.111	0.000
HAB * Exp → Behavioral Intention	0.189	0.187	0.095	1.987	0.008
Facilitating Condition → Behavioral Intention	0.614	0.619	0.113	5.435	0.000
HM * Age → Behavioral Intention	0.507	0.502	0.098	5.178	0.000
HM * Gend → Behavioral Intention	2.650	2.624	0.354	7.487	0.000
HM * Exp → Behavioral Intention	0.941	0.932	0.287	3.28	0.000
Habit → Behavioral Intention	0.367	0.364	0.118	3.112	0.000
Hedonic Motivation → Behavioral Intention	0.142	0.141	0.049	2.899	0.001

Table 4. (*continued*)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (lO/STDEVl)	PValue
PV * Age → Behavioral Intention	0.396	0.392	0.123	3.222	0.000
PV * Gend → Behavioral Intention	0.353	0.350	0.084	4.203	0.001
PV * Exp → Behavioral Intention	0.294	0.291	0.098	2.998	0.005
Performance Expectacy → Behavioral Intention	0.554	0.549	0.159	3.487	0.000
Price Value → Behavioral Intention	0.589	0.576	0.129	4.443	0.000
Social Influence → Behavioral Intention	0.314	0.311	0.098	2.98	0.005
Age → Use Behavior	0.330	0.326	0.113	2.918	0.001
BI*Exp → Use Behavior	0.470	0.465	0.147	-3.198	0.000
Behavioral Intention → Use Behavior	0.589	0.576	0.079	7.443	0.000
Experience → Use Behavior	0.232	0.240	0.080	2.911	0.004
Facilitating Condition → Use Behavior	0.400	0.418	0.087	4.593	0.000
Gender → Use Behavior	0.158	0.157	0.080	1.98	0.008
Habit → Use Behavior	0.116	0.115	0.047	2.476	0.001
HAB * Age → Use Behavior	0.530	0.525	0.129	4.112	0.000
HAB * Gend → Use Behavior	0.217	0.214	0.099	2.187	0.002
HAB * Exp → Use Behavior	0.234	0.231	0.068	3.438	0.000

Table 5. Direct, indirect, total affect performance expectation, effort expectancy, social influence, facilitating condition, hedonic motivation, price value and habit to behavioral intention

	Direct Effect	**Indirect Effect**	**Total Effect**
Age	0.005	–	0.005
HAB*Exp	0.042	–	0.042
Effort Expectacy	0.314	–	0.314
Experience	0.011	–	0.011
FC*Age	0.092	–	0.092
FC*Exp	0.005	–	0.005
FC*Gend	0.005	–	0.005
Facilitating Condition	0.614	–	0.614
Gender	0.012	–	0.012
HAB*Age	0.028	–	0.028
HAB*Gend	0.023	–	0.023
HM*Age	0.108	–	0.108
HM*Exp	0.007	–	0.007
HM*Gend	0.094	–	0.094
Habit	0.055	–	0.055
Hedonic Motivation	0.040	–	0.040
PV*Age	0.030	–	0.030
PV*Exp	0.052	–	0.052
PV*Gend	0.054	–	0.054
Performance Expectacy	0.057	–	0.057
Price Value	0.074	–	0.074
Social Influence	0.081	–	0.081

Based on Table 6, it can be seen that the path coefficient of the facilitating condition is the highest compared to other variables for its effect on use behavior (0.762), while the effect of performance expectancy on use behavior is the lowest (0.034).

Table 6. Direct, indirect, total affect performance expectation, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, habit, and behavioral intention to use behavior

	Direct Effect	Indirect Effect	Total Effect
Age	0.019	0.003	0.022
BAH*Exp		0.025	0.025
BI*Exp	0.045		0.045
Behavioral Intention	0.589		0.589
Effort Expectacy		0.185	0.185
Experience	0.025	0.006	0.031
FC*Age		0.054	0.054
FC*Exp		0.003	0.003
FC*Gend		0.003	0.003
Facilitating Condition	0.400	0.362	0.762
Gender	0.035	0.007	0.042
HAB*Age	0.010	0.016	0.026
HAB*Exp	0.036	0.014	0.05
HM*Age	0.015	0.064	0.079
HM*Exp		0.004	0.004
HM*Gend		0.055	0.055
Habit	0.008	0.033	0.041
Hedonic Motivation		0.023	0.023
PV*Age		0.018	0.018
PV*Exp		0.031	0.031
PV*Gend		0.032	0.032
Performance Expectacy		0.034	0.034
Price Value		0.044	0.044
Social Influence		0.048	0.048

4 Conclusions

The description of the effect of facilitating conditions on behavioral intention is moderated by age and gender, showing an effect on behavioral intention, whereas facilitating conditions with experience moderation have no effect. The effect of hedonic motivation on behavior intention is moderated by age, gender, and experience. Shows an effect on behavioral intention. The price value of behavioral intention is moderated by age and gender, which shows an effect. The effect of habit on behavioral intention moderated by age, gender, and experience shows an effect, and the influence of habit on use behavior

is moderated by age, gender, and experience, showing an effect on behavioral intention on use behavior moderated by experience.

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