

A Study on The Technical Innovation And Purchase Intention In Online Shopping Industry In China

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Abstract--- *Technology is innovated in a high speed, like the 5G taking place of 4G currently, and online shopping development has contribution to the national economy improvement in the recent years. Hence, this research is to study the relationship between the technical innovation and purchase intention in the online shopping in Chinese market, with the mediator variables perceived ease of use, convenience, technological competence, media richness, and the accessibility. In this research, the correlation questionnaires are distributed to the target respondents who are the customers in online shopping industry with the online shopping experiences in the cities, which are innovated with the 5G technology in 2019 in China. With 298 respondents' feedback, the relationship between technical innovation and the purchase intention will be analysed with the multiple regression analysis. There is significant relationship between technical innovation and purchase intention and technical innovation can improve the convenience, technological competence, media richness, the accessibility and the purchase intention in online shopping industry. The technical innovation influences the accessibility and media richness most, and accessibility has the highest influence on the purchase intention. But technical innovation cannot positively influence the perceived ease of use, and with the technical innovation, the perceived ease of use cannot positively influence the purchase intention in the online shopping in Chinese market. Based on the relationship between technical innovation and purchase intention in the online shopping industry in China, this study gives some practical implications to the online shopping development with the technical innovation. With the study on the technical innovation in China, the "Chinese model" online shopping industry may be applied and developed in other nations and markets.*

Key Words--- *Technical Innovation, Perceived ease of use, Convenience, Technological competence, Media richness, Accessibility, and Online Shopping*

I INTRODUCTION

I.I. Introduction and Background of study

Currently, the online shopping is at high speed developing in Chinese market and has great contribution to the Chinese national economic development. As reported in China, there are 130 million broadband accounts and \$190 billion in sales in 2012, there are some online retailers like Taobao, Tmall, and Jingdong, those just like the eBay in United States, for the Chinese E-commerce market, and just for Taobao retailer, there are 6 million registered sellers who can provide different types products and services (Internship China, 2016). In 2018, the online retail sales are \$1.33 trillion US dollar (just over 9.00 trillion yuan), with 23.9% increase comparing to that in 2017, according to the National Bureau of Statistics of China (James Melton 2019). In 2017, there were 42.5 million job created from online shopping, and in 2018, it increased to 48 million jobs, just in Zhejiang province, In Zhejiang province, 506

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villages are working for the online shopping industry and creating jobs for 200,000 people (People's Daily Online 2018). Hence, the online shopping can contribute to the economy development by improving the trade business, providing platforms for retailing, and job opportunities creation.

In the online shopping development, the technology innovation in China contributed to the online development. Firstly, the technology innovation can help online shopping expand the market in China. For instance, the cashless payment approach, especially the wireless payment approach makes the trade online more easily and safety. In Chinese there are two main wireless payment approaches, Alipay and WeChat pay. WeChat pay is the payment approach developed with the WeChat, a social media, like Facebook and WhatsApp, and it was launched in 2011 and had 1082 million users in the third quarter in 2018, with an increasing trend for the number of the users (Mansoor Iqbal, 2019). As the Xinhua news, the Alipay also exceeded 1 billion in January 2019 (Xinhua, 2019). These large number of the users are the customers and potential customers for the online shopping. The technology innovation can direct contribute to the number of the customers and potential customers increase for the online shopping development. Secondly, the technology innovation can contribute the online shopping development with fast and safe internet support. For instance, as the research, it is found that the internet was so developed and the mobile broadband almost fully covered in China by the 4G adoption (Bien Perez, 2016). In 2019, the 5G is developed and quickly applied in the commercial usage. For instance, in May 2019, BBC applied the 5G from Huawei (Chinese company) for the live broadcast which is UK's first live 5G broadcast on a commercial network. The fast and safe internet development and widely usage in China support the online shopping development.

I.II. Problem of statement

The first problem is the safety issue in the online shopping development. How to keep the online shopping safe and keep the customers information not leak to the public for the commercial purpose. For instance, during the payment process, whether it is safe to pay for bill through the internet, and the online shopping platform and the sellers whether can maintain the customers information ethically or not. When the product is distributed, the information like the phone number and address are just printed on the package of the products, whether the distributors can well keep and distribute to the customers without any information leak. There are many cases that the customers personal information is leak and spread in public, then there are some sales companies will call these customers to do their promotion. For instance, there are some insurance companies will make phone call to the people whose information like phone number and address are sold to the insurance companies.

The second problem is the conflict between the traditional trade model and the new online shopping style. Some people, especially the old people still prefer the traditional purchase model which is to go to the store directly and purchase the products. Without visiting the physical stores, they cannot touch and evaluate the physical products probably. For instance, to purchase the shoes, they prefer to try on to determine that the size, the color and the price whether suit for them or not. Even some store is far from their home, they still prefer drive to the physical to purchase the goods. However, some people, like the younger people, prefer to purchase the goods online without visiting any stores and directly make payment online. This is because that the young people are busy and do not want to go the physical stores far away. Like purchasing the shoes, they just find the brand, determine the color, size, and view the price, then they just click some buttons on their phones, tablets, or laptop, and the shoes will be delivered to them soon. Hence there is a conflict between the purchase style among the different customers.

The third problem is the strongly influence from the online shopping to the physical store development. The online shopping style without the physical stores and less staff in the shops can save their operational cost, so the price on the online shopping platform usually lower than the price of the products sold in the physical stores. It was reported that among the 101-physical store in 2014, the profit decreased by more than 15% and the area of these physical store decreased by 6.6% (People.cn, 2015). Therefore, the online shopping becomes a big challenge to the physical challenge. This makes the physical store owners change their business style. If not, they will have less and less profits. That is why some stores in China sell the products both online and offline. Hence, although the sales on the offline selling in the physical store reduced, the sales online increased. Then total sales may be similar to the past sales or more than the past sales.

I.III. Research objectives and research questions

I.III.I Research objectives

- To determine the relationship between technical innovation and purchase intention in online shopping in China.
- To determine the relationship between technical innovation and mediator variables which consisting of perceived ease of use, convenience, technological competence, media richness, accessibility in online shopping in China.
- To determine the relationship between mediator variables which consisting of perceived ease of use, convenience, technological competence, media richness, accessibility and purchase intention in online shopping in China.

I.III.II. Research questions

- To what extent the technical innovation will influence purchase intention in online shopping in China?
- To what extent the technical innovation will influence the mediator variables which consisting of perceived ease of use, convenience, technological competence, media richness, accessibility in online shopping in China.?
- To what extent the mediator variables which consisting of perceived ease of use, convenience, technological competence, media richness, accessibility will influence the purchase intention in online shopping in China?

I.IV. Significance of study

This research is significant to the field of study. The online shopping is as one model of the electronic commerce which has been developed quickly in Chinese market and it quickly form the Chinese online business model which has difference from the previous electronic commerce in other countries. The factors which can determine and motivate the customers' purchasing intention in China is essential to be conducted in China to test that what factors can drive the Chinese customers purchasing intention. This will be significant to the academic study on the online shopping industry in Marketing field.

Moreover, this research is significant to the organizations, companies, and the online shopping industry development. In this research, the Chinese online shopping model will be introduced and analyzed, and the organizations who are the plan to start or continue the business about online shopping industry can refer to this research to get the new idea to better their online business. For instance, the research will introduce the media richness which may contribute the online shopping with the innovation which is from the picture to the video to introduce the products to customers and attract customers attention on the products on the online shopping platform. The companies in this industry can better their services online to gain more profits. With more companies' improvement and development in the online shopping industry, this industry will have more contribution to the national economy.

This research is significant for the individuals or customers to know more about the online shopping during their common life activities. When the online shopping industry is developed, everyone can participate the online shopping activities. For instance, with the online shopping development, there is a platform in China called Xianyu for the individuals to put the thing they do not want to sell to others. Beside this, the customers and potential customers may easily evaluate the online shopping activities and get the accurate information and measurement for the online products and services, then they can make smart decision on their purchasing behavior in the online shopping activities.

I.V. Definition of term

Online shopping

The online shopping is one of the business styles in which the products and services can go to the customers from the manufacturer and retailers directly. The seller, the retailers, the manufacturers and others can direct put their products and services information on the online platform, such as Tmall (Alibaba), and customers view the products details from this platform directly, like the color, size, price, manufacturer, and so on. When customers prefer this product, they make payment online by the smart devices, like smartphone, tablets, and laptops. Then the products will be distributed to the customers directly.

Purchase intention

The purchase intention is the customers behavior when the customers have conviction on the products provided on the online shopping platform and purchase these products and make payment action. This refers to the customers willingness to pay for some products and services during the online shopping experiences.

Technical innovation

Technical innovation is the technology change on the product and services and in this research, it refers the technology changes on the online shopping, such as, the online view products and services approach, wireless payment approach, distribution process and all the technologies applied in the online shopping experiences.

Perceived ease of use

The perceived ease of use refers to the free of effort for the customers to purchase the goods online, like learning the online shopping is easy and without mental effort. In this research, it means that the customers purchasing the goods and service through the online shopping is very easy and the customers do not need to put much effort on leaning the online shopping and purchasing goods online.

Convenience

The convenience is the situation in which there is less effort for the customers and easy to purchase the product online without discomfort and the difficulties. In this research, it refers to the less effort for the customers during the purchasing experience online from the products search, detail viewing, information communication, payment easily, distribution efficiency and effective service after sales.

Technological competence

The technological competence in this study is the technology adoption in the companies or the participates of the online shopping activities, and this is the ability of the companies or the participates conducting the online shopping business with the IT infrastructure and IT professionals.

Media richness

The media richness in this research is the ability of the online shopping organizations to carry the related information to the customers and becomes an environmental factor for the customers and drive them to behave with the information around the customers.

Accessibility

The accessibility is the way to enter the online shopping platform, and the ability to access the related information and the related steps to complete the online shopping process for the customers.

II LITERATURE REVIEW

II.I. Technical innovation

Technical innovation is defined as the integration of the new technology applied into the products and the process (Zhou et al., 2005) and the technical innovation consists of the product innovation and the process innovation (Tohidi and Jabbari, 2012). The technical innovation is also defined as the new product or process development and the technological changes to the product and the process (Turker, 2012). In the product aspect, the technical innovation is mainly to drive to make the new product and increase the current product quality (Birasnav et al., 2013), and the technical innovation is one important factor to apply the differentiation strategy in the market (Terziovski and Guerrero, 2014) Then on the process, the technical innovation is the enhancement internal production targets, such as the production revenue increase, production cost decrease, quality enhancement, and the eco-friendly production in the internal firms' process (Lager, 2002). The technical innovation can improve the product quality, the product process effectiveness, and the productivity.

II.II. Perceived ease of use

The definition of the perceived ease of use is “the degree to which an individual believes that by using a particular technology would be free of effort”, and the perceived ease of use can strongly influence the technology acceptance, and when there is a high level of the ease of use, this technology would be more preferred among the different options (Davis, 1989). Shrawan and Mohit, (2018) also found that the ease of use can positively influence the purchase intention in the online shopping industry. Christopher et. al., (2018) conducted the research on the perceived ease of use on the applications, and found that the perceived ease of use can be a critical attribute for the applications on the customers' connections that can influence the customers' purchase channel preference on selecting the applications. In this study, the perceived ease of use is one of the most important factors for the customers to select the online shopping channels for the customers.

II.III. Convenience

The convenience refers to the speed and ease of shopping in the retailing industry. Brown (1990) found that there are five dimensions for the variable convenience, consisting of the time convenience, the place convenience, the acquisition convenience, the use convenience, and the execution convenience. In the past research, Gehrt and Yale (1993) also found the three distinct dimensions which are the time convenience, place convenience, and the effort convenience. This shows the advantages of simplicity and universality. But Berry et al. (2002) found two major weaknesses: these three dimensions are not mutually exclusive, due to their high correlation and this also lacks of the meaningful analytical functions. Seiders et al. (2000) also found the four avenues to offer the convenience, access, search, possession, and the transaction in which the consumers can easily reach the retailers, identify and choose the product, receive the product, and amend the transaction. After this Seiders et al. (2007) developed the five-dimension instrument with the SERVCON scale in 17 items. Kwek et al., (2010) also identified the convenience as the location convenience, the parking convenience, and the sales assistant convenience. Beauchamp and Ponder (2010) examined the convenience with the different situation between in the physical store and online, and found that the customers are more convenient to purchasing the products online on the access convenience and search convenience, not in transaction convenience. Ling et. al., (2013) also did the research on convenience with five dimensions in the online

shopping and found the customer's purchasing intention is highly influenced by the convenience in the online shopping.

II.IV. Technology competence

Trainor et al. (2011) has done the past research on the information technology and the marketing and found that the technology orientation is much important in the company if the company is in the e-commerce and tried to achieve good performance. Besides, the technological competence is one of the important factors of the technology in the company. Xu et al. (2004) conducted the research on the global technology and the local adoption and found that the technological competence is important in the company's adoption of the innovation. Wang et al. (2010) found that the technological competence which also has been called the technological readiness, including the IT infrastructure and the IT professionals, and this technological competence can cover the main technological aspects. Sonia et. al. (2012) also did the research on the mobile commerce and found that the technology competence can contribute to the firm's engagement in the mobile commerce and influence the perceived performance of the mobile commerce.

II.V. Media richness

Brunelle (2009) introduced the media richness within the integrated model in the customer's intention in the online shopping and the media richness is important on the web in the online shopping industry. The definition of media richness is the ability of the medium to carry the information (Trevino et al., 1987) and Min Li et. al., (2012) defined the media richness as one of the environment input which can influence the customers with the affection around the customers to have the purchasing action, and they also found that the new technology on mobility can bring the impact on the quality or the nature of communications between people, those can enrich the customers' mobile life and can increase their pleasure and the excitement in their usage. Davis (2010) also found that the customer purchasing experience would have more fun when it is easily to communicate between the customers and sellers, to easily seek the related information and to be entertained ubiquitously, so the media richness can become one factor to proceed the customers' emotion during the purchasing activities.

II.VI. Accessibility

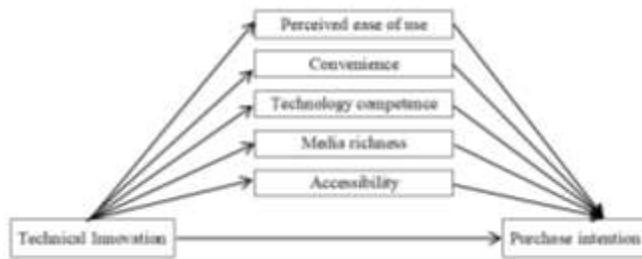
The accessibility is the ability to the web information in the online shopping and this accessibility to the web site is the most important factor to determine the consumers' perceived online shopping convenience (Ling Jiang, et. at., 2013), and they also found that the customers more concern and enjoy the benefits of the accessibility in the online shopping, especially the accessibility to the products, the brands, and the stores those unavailable in the location around the customers. In the past research, the accessibility offered by the mobile devices, together with the convenience, connectivity, and the flexibility were identified as the important factors in the mobile commerce (Kim et al., 2010; Xu and Gutierrez, 2006). Min Li et al., (2012) found that the accessibility is significant in the customer experience in the mobile commerce, and in the study, the media richness and accessibility is more important than the convenience to affect the consumer experience.

II.VII. Purchase intention

The definition of the purchase intention is the subjective probability which the customers purchase the products from the same sellers (Chiu et al., 2012). In the past research, the purchase intention means the degree of the perceptual conviction of the customers to purchase the goods and services from this organization, and this can reflect the customer's biased behavior to the brand and indicates that the customers are satisfied with this products and services (Rajaobelina and Bergeron, 2009). When the customers are loyal to the products exhibition, the customers will have the purchase behavior (Ercis et al., 2012). Akhter (2010) found that there is strongly significant relationship between the purchase intention and the repurchase intention, and the customers who are have the purchase intention, usually will purchase more in the future. In the past research, Pappas et al., (2014) found that the high purchase intention can drive the firms to gain the high profits, and it is critical to determine the key factors which can impact the customer's purchase intention. Shrawan and Mohit (2018) conducted the research on the online shopping with the case study of Y generation and found that the ease of use has the positive relationship with repurchase intention with the mediation of customer satisfaction, and the ease of use positively influences the customer satisfaction and both ease of use and customer satisfaction can influence the customer purchase intention in the online shopping.

II.VIII. The conceptual framework

FIGURE1 THE CONCEPTUAL FRAMEWORK



2.9 Hypothesis development

- H1. There is a relationship between technical innovation and purchase intention in online shopping.
- H2. There is a relationship between technical innovation and perceived ease of use in online shopping.
- H3. There is a relationship between technical innovation and convenience in online shopping.
- H4. There is a relationship between technical innovation and technology competence in online shopping.
- H5. There is a relationship between technical innovation and media richness in online shopping.
- H6. There is a relationship between technical innovation and accessibility in online shopping.
- H7. There is a relationship between perceived ease of use and purchase intention in online shopping.
- H8. There is a relationship between convenience and purchase intention in online shopping.
- H9. There is a relationship between technology competence and purchase intention in online shopping.
- H10. There is a relationship between media richness and purchase intention in online shopping.
- H11. There is a relationship between accessibility and purchase intention in online shopping.

III METHODOLOGY

In this research, the sample is the online shopping customers in Chinese market. With the convenience sample technique, the data is collected to determine the relationship among the variables. The correlation questionnaire is designed with the variables, consisting of technical innovation (Camison and Villar Lopez, 2014), perceived ease of use (Chao Min Chiu, et. at., 2009), convenience (Min Li et. al., 2012), technological competence (Sonia et. al., 2012), media richness (Min Li et. al., 2012), accessibility (Ling Jiang, et. at., 2013) and purchase Intention (Wei Tsong Wang and Hui Min Li, 2012). The 5 likert scales is applied in the measurement. The data analysis is based on the 298 samples to show the relationship between the technical innovation and purchase intention with the mediator variables in this research.

IV FINDINGS

IV.I. Demographic profile

TABLE 1 DEMOGRAPHIC PROFILE

		<i>Frequency</i>	<i>%</i>
Gender	Male	147	49.3
	Female	151	50.7
	Total	298	100.0
Age	≦ 18 years old	81	27.2
	19 - 25 years old	161	54.0
	26 - 30 years old	30	10.1
	31 - 35 years old	11	3.7
	36 - 40 year old	9	3.0
	41 - 45 years old	6	2.0
	Total	298	100.0
Education	Diploma and below	45	15.1
	Degree	161	54.0
	Master	66	22.1
	PhD	26	8.7
	Total	298	100.0
Income	≦ RMB2,500	67	22.5

	RMB2,501 - 3,500	41	13.8
	RMB3,501 - 4,500	42	14.1
	RMB4,501 - 5,500	52	17.4
	RMB5,501 - 6,500	49	16.4
	RMB6,501 - 7,500	27	9.1
	≧ RMB7,501	20	6.7
	Total	298	100.0
Experiences	2 years and below	75	25.2
	3 - 4 years	82	27.5
	5 - 6 years	107	35.9
	7 - 8 years	30	10.1
	8 years and above	4	1.3
	Total	298	100.0

The table 1 shows the demographic profile with the exact amount and percentage on the gender, age, education, monthly income and the online purchasing experience for the respondents who are Chinese online shopping customers.

IV.II The reliability test

Table 2 shows the reliability statistics with the Cronbach's alpha and the items amount. The abbreviations below are TI (Technical Innovation), PEU (Perceived ease of use), CON (Convenience), TC (Technological competence), MR (Media richness), ACC (Accessibility), and PI (Purchase Intention). In the reliability test, the variables have high reliability, such as the purchase intention (0.88), media richness (0.809), technology competence (0.804) and technical innovation (0.822). Other variables have mediate reliability, like perceived ease of use (0.715), convenience (0.789), and accessibility (0.794). All reliability result on the variables is more than 0.7 in this research.

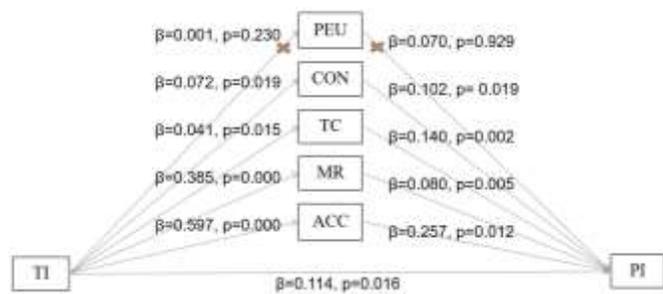
TABLE 2 RELIABILITY STATISTICS

Variables	Cronbach's Alpha	N of Items
PI	.880	5
PEU	.715	5
CON	.798	4
MR	.809	4
TC	.804	3
TI	.822	4
ACC	.794	4

IV.III Multiple regression

In the multiple regression, the model 1 shows the estimate on the variable to the dependent variable purchase intention and the R square is 0.191, means that 19.1% of the total variation of the dependent variable purchase intention can be explained by variables perceived ease of use, convenience, media richness, technology competence, accessibility and technical innovation in the model. With the coefficient, there is a positive relationship between technical innovation and purchase intention, positive relationship between the mediator variables and the dependent variable purchase intention. However, there is no positive relationship between technical innovation and perceived ease of use in this research. In this model, it indicates that there is a significant relationship between technical innovation ($\beta=0.114$, $p=0.016$) and purchase intention, a significant relationship between the mediator variables convenience ($\beta=0.102$, $p=0.019$), technology competence ($\beta=0.14$, $p=0.002$), media richness ($\beta=0.08$, $p=0.005$), and accessibility ($\beta=0.257$, $p=0.012$) and dependent variable purchase intention, but there is no significant relationship between perceived ease of use ($\beta=0.07$, $p=0.929$) and purchase intention in online shopping.

FIGURE 2 THE REGRESSION ANALYSIS



There are other models indicating the relationship between the technical innovation and the mediator variables illustrated in the left side of the figure 1. From these results, there is a positive relationship between technical innovation and the mediator variables. It is found that there is positive relationship between the technical innovation and the mediator variables, the convenience ($\beta=0.072, p=0.019$), media richness ($\beta=0.385, p=0.000$), technology competence ($\beta=0.041, p=0.015$), and accessibility ($\beta=0.597, p=0.000$).

V DISCUSSION

With the data analysis, it is found firstly that the technical innovation positively impacts the convenience, media richness, technology competence and accessibility. When the technical innovation improved, the accessibility is influenced to improve most, and the media richness is influenced secondly to improve. The technology competence and the convenience are also influenced weakly by the technical innovation in the online shopping industry. Hence, technical innovation can contribute to convenience, media richness, technology competence and accessibility in online shopping in China. Secondly, there is a positive relationship between the technical innovation and purchase intention and a positive relationship between the mediator variables (convenience, media richness, technology competence, and accessibility), and the purchase intention. Thirdly, the accessibility has the highest influence on the purchase intention, technology competence and the technical innovation have the second and third highest influence on the purchase intention. Therefore, the technical innovation can contribute the online shopping development with more friendly accessibility and the high media richness to increase the purchase intention in online shopping.

However, there is no significant relationship between the perceived ease of use and the purchase intention and when the technical innovation is improved, the perceived ease of use is not as enhanced as the technical innovation in this research, and the technical innovation may reduce the perceived ease of use in the purchasing activities in the online shopping in China. this may lead to more difficulties in the process of the technical innovation contributing to the online shopping development. This is one reason why the online shopping industry in “China model” cannot easily developed in other nations and markets.

VI CONCLUSION & RECOMMENDATIONS

In conclusion, with the discussion on the technical innovation in the online shopping, the organization or companies who plan to enter the online shopping industry have to concern the technical innovation and the influence on the customers purchase intention in the online shopping. The technical innovation can increase the convenience, the technology competence, the media richness, accessibility and the purchase intention, but cannot increase the perceived ease of use in this research. Therefore, when there are some organizations and firms who plan to enter the online shopping industry and the government schedules to improve the online shopping development, the technical innovation is one of the important factors to increase the customers’ purchase intention and the perceived ease of use has to be concerned to make the online shopping process and purchase approaches easily, usage friendly and free effort for the current customers and potential customers. In this way, the technical innovation will have more contribution to the customer purchase intention and more contribution to the online shopping industry development.

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