Towards Modelling Factors of Intention to Adopt Cloud-Based M-Retail Application among Textile Cyberpreneurs

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Abstract— **Nowadays, conducting retail activities through the use of mobile devices are very common among the internet entrepreneurs or cyberpreneurs in Malaysia. The emergence of various mobile applications especially social media apps have boosted the buying and selling activities due to the increasing number of mobile device users. Clothes are one of the most popular products that are being sold via Internet. Besides social media channels, textile cyberpreneurs in Malaysia use websites and m-retail applications like mobile marketplace applications that utilize cloud services for conducting online business. Determining the intention to use m-shopping services among the consumers was usually conducted in previous researches, but investigating the issue from retailer's perspective was rarely done. Therefore, this study intends to investigate the factors that affect the intention to use cloud-based m-retail application among textile cyberpreneurs for better understanding by integrating Decomposed Theory of Planned Behaviour (DTPB) with Technology Acceptance Model (TAM), Task Technology Fit (TTF) and Information System Success (ISS) models. Modelling the right factors may result in future enhancements on the current m-retail applications in m-commerce context based on the requirements of textile cyberpreneurs. This study can be used as a platform in understanding the needs of textile cyberpreneurs in Malaysia to adopt cloud-based m-retail application.**

Index Terms—**cloud-based mobile application, cyberpreneurship, mobile retail, mobile shopping, textile industry, behavioural intention**

I. INTRODUCTION

The technology of Mobile Cloud Computing (MCC) has allowed many researches to be conducted in both industry and academia which had led to mobile application developments in various fields such as for business purposes. Business area may seem profitable as smartphone user nowadays can access Internet at anytime and anywhere. The cloud-based mobile applications are now common to be installed in the mobile devices to perform diverse functionalities with many benefits gained from MCC. Juniper Research [1] has also reported the revenue from mobile enterprise cloud-based applications and services is expected to rise from nearly $2.6 billion in 2011 to $39 billion in 2016.

On the other hand, performing buying and selling of products via the uses of mobile devices is not new among the Internet users. M-shopping or m-retail can be performed by customers or retailers via certain technology or applications. The retailers may encounter several ways to conduct online business through their mobile devices, either by developing their own m-retail application or by using the existing third-party mobile marketplace applications such as Lazada Mobile App [2] and Amazon Mobile App [3]. The third-party m-retail applications are usually the mobile application version of the online marketplaces that are accessible through web browsers. Due to the rapid growth of smartphone users, the number of these applications had also increased to attract users to conduct m-shopping or m-retail activities. The underlying technology for these applications to perform efficiently is supported by the uses of cloud-based platform such as practiced by eBay, Lazada and Amazon.

In Malaysia, many online entrepreneurs or cyberpreneurs are using social media channels to conduct online business [4, 5]. The most common products that are being sold through social medias are clothes [6]. Besides websites and social media channels, some textile cyberpreneurs use the third-party m-retail applications or online marketplaces to conduct business operations. As the retail applications that are developed based on the MCC technology are relatively new in Malaysia, their usage level among the Malaysian retailers remains unclear. Based on the previous works, the researches that are related to m-shopping context are still in infancy state [7, 8, 9], thus more studies must be conducted for further investigation especially from retailer's perspective [7]. Moreover, investigating the factors that may influence the use of new technology is frequently done by many researchers from various fields [10, 11, 12] in order to

gain deeper knowledge on behaviour of users. Furthermore, according to Malaysia Digital Economy Corporation and Ministry of International Trade and Industry (MITI) in National eCommerce Strategic Map [13], one of the problems that averted the acceleration of e-commerce in Malaysia is due to the low adoption and awareness among the Malaysian sellers. By determining the right factors, related issues can be inspected and future enhancements on the subject matter can be properly done.

In general, this research aims to seek for antecedents of factors that may influence the intention to utilize cloud-based m-retail application by combining several theories and models such as Technology Acceptance Model, Decomposed Theory of Planned Behaviour, Task-Technology Fit Model and Information System Success Model. This paper is organized into eight sections. The issues about textile cyberpreneurship and m-retail in Malaysia will be explained in the next section, followed by overview of previous research in the related area and underpinning theories or concepts that are used by the researcher. Then the methodology is discussed before proposing the new research model. Finally the current data collection is presented as well as conclusion.

II. TEXTILE CYBERPRENEURSHIP AND M-RETAIL ISSUES IN MALAYSIA

In 2011, textile industry in Malaysia was ranked 9th largest export earner and accounted for 2.3 per cent share of Malaysia's exports of total manufactured goods [14]. As in 2014, it was ranked 10th with 1.6 per cent share of exports. Therefore textile industry is one of the most focusable industries by the Malaysian government in providing the incentives for further development, especially to incorporate the uses of latest technology for production purposes. To ensure the economic growth, the major players of textile industry were encouraged to produce latest high-end products along with comprehensive research and development activities. According to MIDA [15], exports of textiles and apparel for the year 2014 were RM11.62 billion while imports amounted to RM8.32 billion, thus making textile industry a profitable industry to be ventured.

With the latest underlying ICT advancements such as social media channels and m-commerce, Malaysian textile companies and entrepreneurs have embarked into new approaches in conducting business operations. The rising numbers of mobile device such as smartphones and tablets in the market have also encouraged the m-commerce transaction possibilities. At the same time, social media channels have been widely used by cyberpreneurs for promotions and sales activities [4] and thus include the players of textile industry. The opportunities to conduct online business via social media have been taken by the textile cyberpreneurs from small and medium businesses. Previous researches [16, 17, 18] have proven that social media channels definitely played an important role in promoting and marketing of products, even if the main function of social media is for

socializing. The textile cyberpreneurs conduct their business operations by using the limited functionalities of social media mobile application such as receiving customer orders via "Comment" and "Message" functions. These acts may seem impractical for business purposes, thus may require a more specific mobile business application to be developed and utilized [19]. Moreover, although cloud-based m-retail applications such as Amazon Mobile App and Lazada Mobile App have existed as alternatives to conduct m-retail, the intention to use them among the retailers is still unknown. Besides, as the adoption of e-commerce services are low among the Malaysian sellers [13, 20], more efforts must be performed in examining the issues and finding the right solution to accelerate the utilization. Determining the factors that may lead to the uses of certain technology among the sellers might be helpful for future refinement and development of related e-commerce and m-commerce applications.

III. PREVIOUS RESEARCH

Researches about m-shopping or m-retail in Malaysia are still at infancy stage. Several attempts have been made to elucidate the issues of m-shopping in Malaysia, but the focuses were more targeted to gain knowledge from the consumers' perspective [9, 21] rather than the retailers' perspective. According to Groß [7], little is known about the m-shopping issues from the perspective of retailers, thus requiring more studies to be conducted. Besides, the challenges of m-shopping environment such as incompetent network connections and limited capabilities of mobile devices had delayed the utilization of m-shopping features [22]. Although the number of Internet users is increasing in Malaysia [23], the future of m-shopping remains vague. Malaysian government, who introduced National eCommerce Strategic Map has also encouraged the entrepreneurs especially from small and medium enterprises (SMEs) to get involved in digital entrepreneurship and utilizing e-commerce services. Therefore, more appropriate efforts must be made by investigating the related issues among both consumers and retailers in m-shopping context, especially in Malaysia. Table I summarized the previous works that have been conducted for m-shopping or m-retail adoption factors together with the variables used in each research.

IV. UNDERPINNING THEORIES

The most common theories or models that have been applied in finding the factors of user adoption or user acceptance in m-shopping context are Technology Acceptance Model (TAM) [24] and Information System Success Model (ISS) [25]. Each model has its own strength and limitation.

TAM has been widely used and accepted as an influential tool in determining the factors of user acceptance for more than 50 kinds of information technology systems, products or services [26]. TAM utilizes perceived usefulness and perceived ease of use as

external variables that influence user's attitudes, behavioural intention to use and actual system use. However, it was criticized for being too simple [29] and could only explain 40% of an information system usage [30]. Integrating TAM with other models could improve the predictive influence [30, 31]. The diagram of TAM is illustrated in Fig. 1.

TABLE I.   RESEARCH ON M-SHOPPING / M-RETAIL ADOPTION

| Author	Frameworks used	Variables	Focus of research
Wong et al. (2015) [9]	TAM	Perceived ease of use, perceived usefulness, compatibility, perceived enjoyment and perceived cost	Malaysian consumer
Wong et al. (2012) [21]	TAM	Perceived ease of use, perceived usefulness, perceived risk, subjective norms and personal innovativeness in information technology	Malaysian consumer
Manzano et al. (2009) [27]	TAM	Perceived ease of use, perceived usefulness, attitude, innovativeness, affinity, compatibility, and m-shopping intention	M-shopping patronage among Spanish consumer
Chen (2013) [8]	ISS	System quality, information quality, service quality, perceived usefulness and customer satisfaction	Purchase intention among Taiwanese consumer
Chen (2012) [28]	ISS	System quality, information quality, service quality, perceived usefulness and purchase intention	Organization performance among Taiwanese marketers
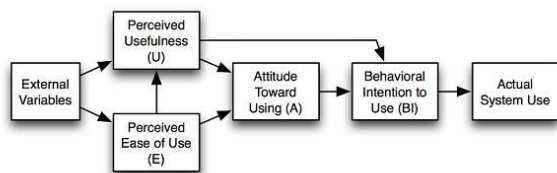
Figure 1. Technology Acceptance Model [26]

ISS model was introduced in 1992 by DeLone and McLean [25] in aiming to measure the success of information system (IS) quality and effectiveness. The original ISS model has six constructs which are system quality, information quality, use, user satisfaction, individual impact and organizational impact. After evaluation, the model was revised and updated [32] with new variables that include system quality, information quality, service quality, system use, user satisfaction and net benefits. The net benefits variable had replaced the individual impact and organizational impact variables to

allow various relevant constructs to be analyzed according to the researchers' interest. The diagram of updated ISS model is shown in Fig. 2.
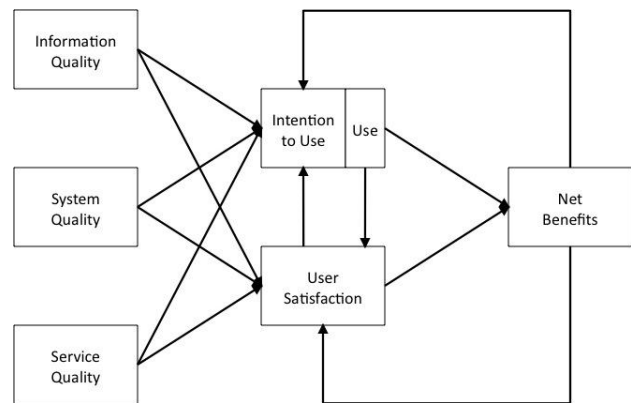

Figure 2. Information System Success Model [33]

Besides these two approaches, the other common theories or models to measure the usage intention are Theory of Planned Behaviour (TPB), Task-Technology Fit (TTF) model and Decomposed Theory of Planned Behaviour (DTPB).

TPB was founded by Ajzen [33] as an extension of theory of reasoned action (TRA) [34, 35]. It is normally used to explain the behavioural intention of an individual which could be determined via attitude, subjective norms and perceived behavioural control constructs. Efforts have been done by many researchers in extending TPB by adding new constructs [36, 37] for better accuracy in predicting the intention and behaviour, which has also been encouraged by Ajzen himself. The illustration of TPB is shown in Fig. 3.
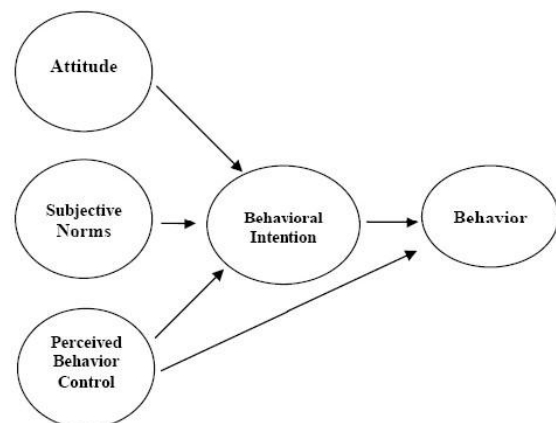

Figure 3. Theory of Planned Behaviour [34]

TTF model on the other hand was proposed by Goodhue and Thompson [38] in depicting that performance and technology adoption are based on the fit between the required tasks and the traits of the technology. It consists of task requirements, technology characteristics, task technology fit, individual performance and utilization constructs. TTF has also been combined with other models such as TAM for better assessment of user adoption in information technology

context [39]. According to TTF, a good task technology fit will increase the intention to adopt the technology, while a poor task technology fit will decrease the chance of user intention to adopt. Fig. 4 shows the illustration of TTF.
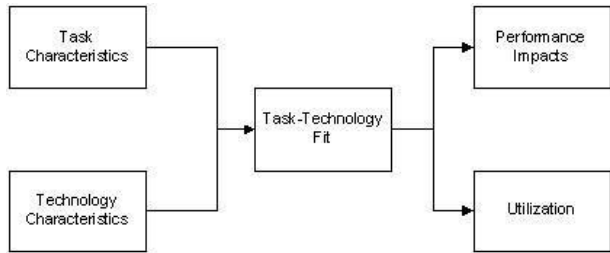

Figure 4. Task-Technology Fit Model [38]

Meanwhile, DTPB was introduced by Taylor and Todd [40] by integrating the features of Innovation Diffusion Theory (IDT) [41] with the features of TPB. This expansion includes the fragmentation of TPB into further constructs to improve the behavioural intention of a user in using a system. DTPB divided the attitude construct into three associated constructs namely perceived usefulness, ease of use and compatibility. It has also divided subjective norm into two constructs which are peer influences and superior influences. Then finally the perceived behaviour control is divided into three constructs specifically as self-efficacy, technology and resources. As compared to the basic TPB model, DTPB has been proven to be better in predicting the behavioural intention of a user [10, 40]. The illustration of DTPB is shown in Fig. 5.
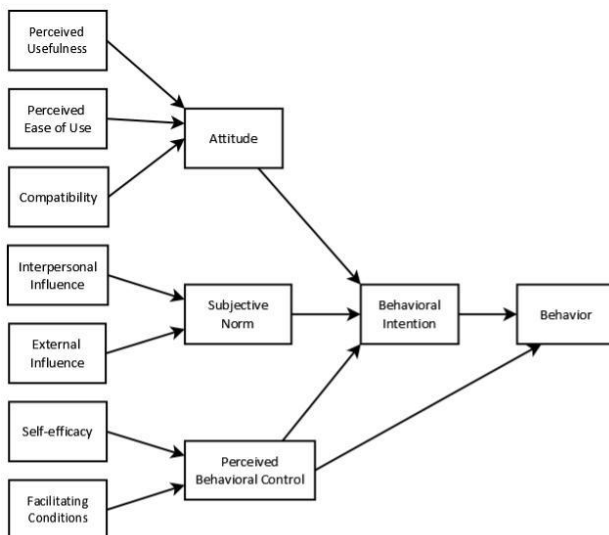

Figure 5. Decomposed Theory of Planned Behaviour [40]

Up to researchers' knowledge, there are limited studies in m-shopping context that uses TTF and DTPB in

determining the m-shopping adoption among the Malaysian users.

V. METHODOLOGY

Extensive literature search has been conducted in finding the relevant issues regarding m-shopping adoption, behavioural intention and textile cyberpreneurship in Malaysia. Previous works that are related to m-shopping acceptance have also been studied in determining the possible solution for analyzing the factors that may affect the intention to use cloud-based m-retail application among textile cyberpreneurs. The methods that have been applied by researchers from previous works and their findings were studied for better clarification on certain issues.

Qualitative literature review [42] method has been used in skimming and synthesizing the information from the literatures and documents that are related within the studied contexts. The undertaken steps have also followed the approach which has been suggested by Doherty and Ellis-Chadwick [43] as follows:

- Identify appropriate online indexes - Emerald Insight, Springer Link, Taylor & Francis Online, Science Direct, IEEE Explore etc.
- Identify appropriate search terms - Ex: "cloud-based mobile application", "m-shopping in Malaysia", "m-retail application", "internet retailing", "online entrepreneur". "Technology Acceptance Model" etc.
- Construct an appropriate sample of journals - Articles were arranged according to the search terms
- Identify papers to include in review - Select the most relevant articles that are related to the study

VI. PROPOSED MODEL

A new model is proposed by merging DTPB model with TAM, TTF and ISS models in determining the intention to use cloud-based m-retail application among the textile cyberpreneurs in Malaysia. Several new constructs are also added to suit with the context of study. As Information System (IS) consists of major components that include people, system and processes, thus it is preferable to combine the related models that depict the components for better explanation by looking from various aspects that are essential in IS. According to Joshi [44], one of the well-received definition of IS is *"...a computer system that stores data and supplies information, usually within a business context. Information systems often rely on databases. A system of people, procedures, and equipment, for collecting, manipulating, retrieving, and reporting data"*. Based on this definition, the proposed model is illustrated as shown in Fig. 6.
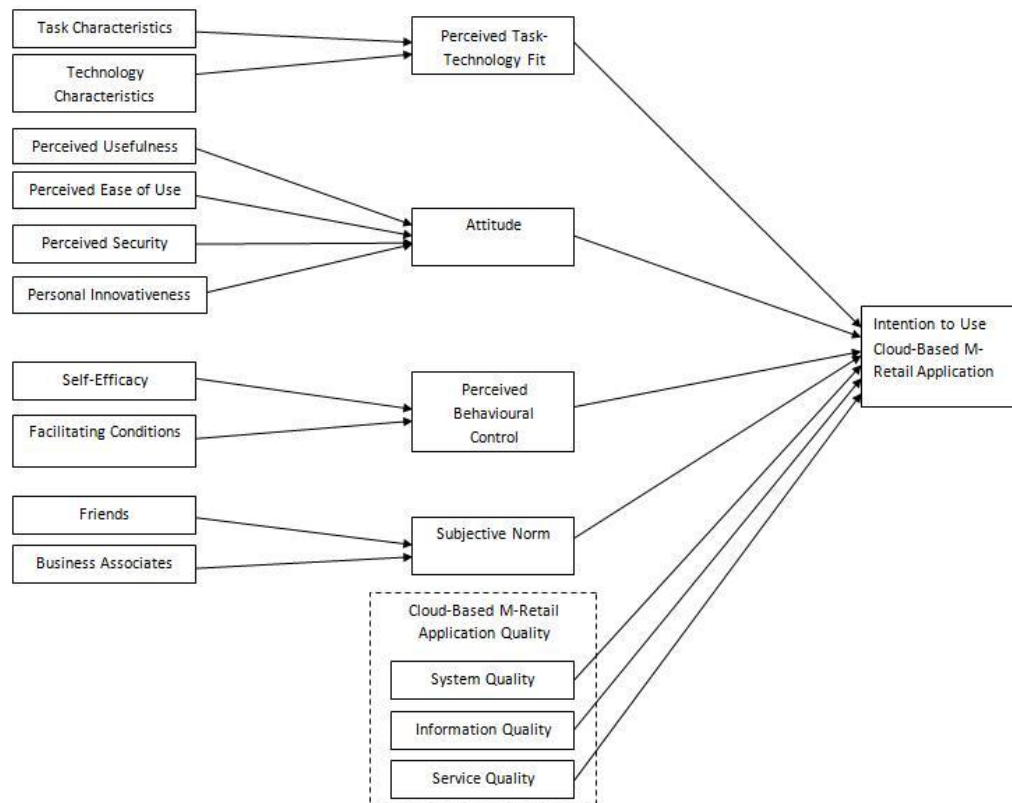
Figure 6. Proposed model

TTF model can be used to measure the suitability of tasks that are performed by the retailer with the characteristics of cloud-based m-retail application. The business needs of a retailer can be obtained by specifying their required tasks and the needs to use the application. Hence, TTF may represent the business process or procedures component of IS in this context.

DTPB on the other hand is clearly used to measure the behavioural intention of the user, which is the textile cyberpreneur's intention in this study. As DTPB may explain retailer's characteristics based on attitude, subjective norm and perceived behavioural control, thus it can represent the people component of IS. For this study, the specific attributes for attitude construct are perceived usefulness, perceived ease of use, perceived security and personal innovativeness. Compatibility attribute from the original DTPB model is excluded from the study because the tasks compatibility with the technology has been measured via TTF. Meanwhile, perceived security is added mainly because cloud-based m-retail application is a new technology that is exposed to uncertainties, especially in e-commerce and m-commerce context. Previous studies such as performed by Keisidou et al. [45], has shown that perceived security has a significant positive effect on attitude in determining the factors of online shopping acceptance. Next, personal innovativeness attribute is added to the attitude construct because it is one of the major traits of cyberpreneur [46]. Besides, personal innovativeness plays an important role in technology adoption as been proven in previous works [47, 48]. As for subjective norm construct, the business

associates variable is added for determining its influence in the textile cyberpreneur's business environment. The business associates may consist of vendors, suppliers, dropshippers or service providers that are related to textile cyberpreneur's online business operations. Previous work by Pavlić et.al (2012) [49] has used business associates construct in determining factors of intention to use mobile marketing services among business organizations and students in Croatia.

To represent the system component of IS, ISS model may be used in tailoring the quality characteristics of application with the retailer's intention to use the cloud-based m-retail application. The application's quality will consist of system quality, service quality and information quality.

Each variable or antecedent is expected to have positive effect on the related dependent variables. Based on these models, the behavioural intention of a user can be analyzed from the holistic view of IS definition.

VII. DATA COLLECTION

A pilot study is currently being conducted by distributing 60 questionnaires to textile cyberpreneurs who have participated in Mood Republic event on 1st and 2nd September 2016 in Kota Bharu, Kelantan. Dual-languages which are in English and translation in Malay language are used for the questionnaire. As for the scale measurement, five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree is used. The reliability of questionnaire items and the data are being analyzed by using SPSS Statistics software. In the future,

more data is expected to be collected by survey distribution to a larger group of respondents.

VIII. CONCLUSION

Cloud-based m-retail application is a new technology that is used by both customers and retailers in m-shopping or m-retail context in Malaysia. Acquiring the right factors of intention to use cloud-based m-retail application among the textile cyberpreneurs will probably help the application developers in designing the right application with suitable features that are required by textile cyberpreneurs in the future. The proposed model combines DTPB with TAM, TTF and ISS models by looking from the perspective of IS definition for a holistic explanation. More factors can be added to the model for future studies in determining the comprehensive requirements of textile cyberpreneurs. As previous works have focused more on customer's perspective with regards to m-shopping, gaining the information from retailer's perspective may seem helpful in filling the knowledge gap. Hence, this study can be used as a platform in understanding the needs of textile cyberpreneurs in using the cloud-based m-retail application.

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