Factor influence to adoption of mobile commerce application

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Abstract

Currently, mobile phones play a significant role in daily life, particularly in the online trading business sector. Mobile commerce applications have gained widespread popularity as they facilitate communication and transactions through mobile devices. This study aims to identify the key factors influencing consumers' adoption of mobile commerce applications. Using data from 96 respondents, a modified version of the extended Unified Theory of Acceptance and Use of Technology (UTAUT) was employed. The findings indicate that performance expectancy, effort expectancy, social influence, facilitating conditions, trust, and price value significantly impact the adoption of mobile commerce applications. Additionally, the study reveals that the amount of expenses incurred influences application adoption, and consumer satisfaction with purchasing products via mobile commerce applications is reported to be at a very high level.

Keywords: Mobile commerce application; UTAUT; Adoption

1. Introduction

Communication has existed throughout history in every nation, group, and language. In its earliest stages, before the invention of communication devices, people relied entirely on bodily gestures and expressions to convey messages. Over time, communication evolved, enabling individuals to connect with others both nearby and across long distances. This progression has been driven by technological advancements that facilitate human interaction. Examples of such developments include the telegram, landline telephones, and mobile phones, each contributing to the continuous improvement of communication methods.

At present, technology, particularly the Internet, plays a crucial role in daily life. This has significantly contributed to the growth of the domestic economy, particularly in the business sector. Consumer behavior has shifted towards the use of dynamic and portable devices due to their affordability, compact size, and convenience, allowing users to carry them easily. Additionally, software development has made these devices more user-friendly. According to Hyperweb.ca (2013), the use of mobile internet devices doubled in 2012 and was projected to surpass computer-based internet usage within one to two years. In several countries, the percentage of mobile internet users was notably high, with Egypt at 70%, India at 59%, South Africa at 57%, Indonesia at 44%, Canada at 40%, and Thailand at 32%.

In Thailand, data from the 2016 Use of Information and Communication Technology in Households report indicated that in 2012, out of approximately 62.8 million people, around 31.7 million (50.5%) used smartphones. This number was expected to continue increasing in the following years.

The market in Thailand has evolved into a new form known as digital marketing, which refers to the trading of products through internet channels, commonly known as electronic commerce (E-commerce). This transformation reflects the country's growth into a digital economy. The increasing significance of online product purchases is evident, with the market value rising from 2.03 million baht in 2013 to 2014 and continuing to grow in 2015. According to Miss Sunisa Matchjit (2016), the value of the e-commerce market in Thailand is the highest in the ASEAN region for the B2C (Business-to-Customer) model. This highlights the growing importance of digital commercial transactions as a key factor in the modern economy.

Furthermore, advancements in mobile phone technology and wireless devices, including increased device variety, improved system performance, enhanced security, portability, and user-friendly interfaces, have contributed significantly to the expansion of e-commerce via mobile devices (Jakkrit Manwicha, 2016).

Mobile commerce (M-commerce) is defined by the Durlacher Research Institute (Lehner, 2001) as any transaction involving the exchange of monetary value conducted through a telecommunications network using mobile phones. M-commerce represents an extension of technology that has a direct impact on the growth of the e-commerce industry. There are various types of mobile commerce, each with specific contexts. This study focuses on mobile applications that facilitate the decision-making process for selling goods via mobile devices (M-commerce, 2018). The scope of mobile commerce includes different operational models. This encompasses transactions between businesses and individual consumers (Business-to-Customer or B2C) and transactions between businesses (Business-to-Business or B2B). However, recent trends indicate a rise in Consumer-to-Consumer (C2C) transactions, where individuals use smartphones as intermediaries, making this model increasingly popular (Suriyaphat Pumnamyen & Sitanon Jesadapiphat, 2016).

The smartphone market has experienced rapid growth, aligning with Chris Anderson's statement in Wired magazine (2010), "The Web is Dead," which suggests that people increasingly prefer accessing information through mobile applications rather than traditional websites. New Relic (2013) analyzed the mobile application market and provided key insights into user behavior. On average, an individual downloads approximately 41 applications. As of that time, the iOS and Android markets collectively hosted around 1.5 million applications. However, 60% of these applications were never downloaded. Additionally, most users check their mobile phones around 150 times per day. The proportion of consumers purchasing products via mobile phones has increased annually. In 2013, 39% of consumers made purchases through mobile devices, rising to 41% in 2014 and 43% in 2015 (Sittapong Lee Suwan, 2015). Mobile applications enhance consumer access to information, enabling faster searches and offering user-friendly systems that are easy to navigate. Consequently, the continuous development of new applications has become essential. Several factors contribute to the growing popularity and potential success of mobile applications over traditional e-commerce platforms. These include mobility (ease of carrying), reachability (quick access to information), ubiquity (widespread use of mobile phones), and convenience (compact size and user-friendly interfaces) (Noppadon Phongsatharak, 2008). This trend reflects the increasing acceptance of mobile applications in modern society. Furthermore, technological adoption influences consumers' continued engagement with social media, and they readily integrate innovative technologies into their daily lives (Tanyasiri Lappanich & Nittathananitakorn, 2016).

This research examines the extended Unified Theory of Acceptance and Use of Technology (UTAUT) as proposed by Sriyuknirund (2017), which provides a methodological framework for understanding the reasons individuals accept and adopt new information technology. The study aims to identify key principles and gain insights into consumer behavior regarding the adoption of mobile commerce applications (Singha et al., Sununthar et al., 2012). Consequently, UTAUT will be used as the theoretical foundation to evaluate the factors influencing consumers' adoption of mobile commerce applications. In exploring the determinants of technology adoption, numerous researchers have focused on behavioral intentions in choosing mobile commerce (M-commerce). This approach builds upon an understanding of consumer behavior and satisfaction in adopting M-commerce, as examined in studies by Yi-Shun Wang & Yi-Wen Liao (2007), Pruthikrai Mahatanankoon, H. Joseph Wen & Billy Lim (2005), and Silas Formunyuy Verkijika (2018). Based on the findings from previous research, this study will investigate the factors influencing the adoption of mobile commerce applications. Identifying these factors can be beneficial for M-commerce service providers in developing effective strategies to enhance consumer engagement, improve service understanding, and encourage repeat purchases, ultimately fostering long-term customer retention.

2. Research Objectives

This study aims to identify the key factors influencing consumers' adoption of mobile commerce applications.

3. Research Methodology

To better understand the factors influencing consumers' adoption of mobile commerce applications, this research employs a quantitative approach using a survey method. Questionnaires will be utilized as the primary data collection tool to gather insights from respondents.

3.1. Research Data

This study explores Generation Y (Manal Alduaij & Hanaa Al-Amari, 2016), focusing on undergraduate and graduate students in their first to fourth years at Maejo University, Chiang Mai. The research examines students who use mobile phones with internet access to make purchasing decisions through mobile commerce applications. This demographic is particularly relevant as students often possess technical knowledge in fields such as computer science, information systems, and telecommunications management. Additionally, they frequently utilize mobile phones for purchasing goods via mobile commerce applications, making them a key group for understanding adoption behavior in this context.

The sample size for this study is determined using simple random sampling, based on Taro Yamane's formula, with a confidence level of 95% and a margin of error not exceeding 5% (significance level of 0.05) (Noppadon Phongpananarat, 2008). This approach ensures a representative sample for analyzing the factors influencing consumers' adoption of mobile commerce applications.

$$n = \frac{N}{(1+Ne^2)}$$

where n is population size, N denotes the size of the population used in the study, and e indicates sampling error.

The validity and reliability of the questionnaire were assessed to ensure the accuracy and consistency of the measurement tool. To evaluate validity, the questionnaire was reviewed by university professors to confirm its relevance and appropriateness. Reliability was measured using Cronbach's Alpha, as implemented in the SPSS software program, following the approach of Swinda Thirawongchinda (2015). The results demonstrated a very strong reliability level, with a confidence level of 95% (significance level of 0.05). Additionally,

the questionnaire was pre-tested on a sample of 24 respondents to refine the survey instrument before full-scale data collection.

The study employs multiple regression analysis to examine the independent variables based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh et al., 2012). The independent variables include performance expectancy, effort expectancy, social influence, facilitating conditions, price value, and trust, while the dependent variable is the adoption of mobile commerce applications for purchasing goods. The relationship between these variables is analyzed using the following regression equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5$$

where X_1, X_2, X_3, X_4, X_5 are gender, education, revenue, popular to buy shoes, and amount of expenses, respectively.

4. Result and Discussion

4.1 Profile of the Respondents

The survey was conducted with a sample of 95 respondents, selected through random sampling due to time and budget constraints. The demographic profile of the respondents was analyzed based on gender, education level, and monthly income. The results indicated that the majority of respondents were female (71.88%), while male respondents accounted for 27.09%. In terms of education level, third-year students represented the largest group (43.75%), followed by second-year students (26%), first-year students (15.63%), and fourth-year students (10.42%). Regarding monthly income, a small proportion of respondents (4.2%) reported a low income, whereas the highest proportion (38.54%) had a relatively higher income. These findings provide essential demographic insights into the characteristics of respondents, which are relevant for understanding factors influencing mobile commerce adoption.

4.2 Factor Analysis

A linear regression analysis was conducted to identify the factors influencing the decision to use mobile commerce applications among first- to fourth-year students. The regression analysis examined which factors significantly impacted the decision to adopt mobile commerce applications. A total of 96 validated questionnaire responses were used for analysis, with a significance level of 0.05. The regression model was developed using the Enter method in the SPSS program, incorporating all relevant variables into the equation. The analysis was conducted in two parts by comparing the significance (Sig.) values of the coefficients with the

predetermined alpha (α) value of 0.05, allowing for the identification of significant predictors influencing mobile commerce adoption.

The study examines general information and consumer behavior in purchasing products through mobile commerce applications. Table 1 presents the results of the multiple regression analysis, identifying the key factors influencing the decision to adopt mobile commerce applications. This analysis evaluates the significance of various independent variables in predicting consumer adoption behavior, providing insights into the determinants that impact mobile commerce usage.

Variable	B	Std. Error	t	Prob.
Constant	0.244	0.451	0.542	0.589
Gender	0.476	0.284	1.677	0.097
Education	0.001	0.001	1.825	0.072
Revenue	0.037	0.132	0.28	0.780
Popular to buy shoes	0.680	0.258	2.632	0.010
Amount of expenses	0.383	0.107	3.591	0.001
R^2 = 0.295 F-Statistics =				

Table 1 Result of multiple regression analysis

Based on Table 1, the significance values indicate that the factors significantly influencing the adoption of mobile commerce applications at the 0.05 significance level are amount of expenses and popularity in purchasing shoes. These variables play a crucial role in consumers' decisions to adopt mobile commerce. The results of the regression analysis include the coefficient, which represents the strength and direction of the relationship between independent and dependent variables. A higher coefficient indicates a stronger influence of an independent variable on the dependent variable. Therefore, independent variables with higher Beta coefficients have a greater impact on mobile commerce adoption. These findings provide valuable insights for mobile commerce service providers, helping them better understand consumer behavior and develop effective strategies to enhance user engagement and adoption. From the efficiency to predictive value, R^2, is 0.295 meaning that all five independent variables can explain to decision adoption use mobile application of students the first to the fourth in university by 29.5 percent, the remaining percentage 70.5 caused by the influence of other variables. Moreover, statistics used to analysis teste with one-way analysis of variance (One-Way ANOVA). The result shows in Table 2 as follows:

Model	Sum of Squares	d.f.	Mean Square	F	Prob.
Regression	42.238	11	3.84	3.202	0.001
Residual	100.72	84	1.199		
Total	142.958	95			

Table 2 Result of One-Way ANOVA

The result, shown in Table 2, indicates that at least one independent variable significantly influences the decision to adopt mobile commerce applications among university students. Furthermore, the multiple regression analysis for factors affecting the adoption of mobile commerce applications confirms that the regression model is statistically significant, suggesting that the independent variables collectively impact mobile commerce adoption decisions. Additionally, the study evaluates consumer satisfaction levels regarding purchasing products through mobile commerce applications, measuring their overall experience and acceptance of mobile shopping platforms.

The independent variables in this study include performance expectancy, effort expectancy, social influence, facilitating conditions, trust, and price value, each representing a key factor influencing mobile commerce application adoption. Performance expectancy measures perceived usefulness, evaluating how the application enhances purchasing efficiency, while effort expectancy assesses ease of use, determining how simple and user-friendly the application is for consumers. Social influence examines the impact of interpersonal relationships and mass media, analyzing how peers and media affect consumer decisions. Facilitating conditions measure access to necessary resources, including technical support and knowledge essential for adoption. Trust focuses on security and privacy concerns, influencing consumer confidence in mobile commerce applications. Lastly, price value evaluates the cost associated with using mobile commerce applications, determining whether the perceived benefits justify the financial investment. Together, these factors provide a comprehensive framework for analyzing consumer behavior in mobile commerce adoption.

The results of the measurement of satisfaction to buy products via mobile phone applications is showed in Table 3. The average scores of many factors are between 3.50 and 4.49. These indicated that the consumers in Maejo university have satisfied in mobile commerce application adoption.

In this empirical study, we analyzed users' decisions regarding the adoption of mobile commerce applications. Our results indicate that amount of expenses and popularity in purchasing shoes significantly influence the adoption of mobile commerce applications.

These findings align with previous studies, including those conducted by Chutarat Kiatratham (2015) and Rizky Septiani, Putu Wuri Handayani, and Fatimah Azzahro (2017), which similarly identified these factors as key determinants in mobile commerce adoption.

Satisfaction Factors	Average Score
Buying products through applications helps to save travel time.	4.30
Applications are constantly updated.	4.04
There are many types of products to choose from in one application.	4.31
When buying products through applications, there will be convenience compared to buying products at the store.	4.08
The pictures or text in applications are easy to understand and comprehend.	3.70
Promotion affects the decision to buy your products.	4.09
Product presenter affects the decision to buy your product.	3.50
The word of mouth of those around you, such as friends, family, influencing the purchase of your products.	3.75
Some products need to be purchased through the application rather than buying through the store.	3.73
Satisfaction in payment via applications on mobile phones.	3.93
Trust in information displayed in applications.	3.55
Trust with service providers and products through applications.	3.55
Receiving the product at the time agreed with the seller.	3.72
Satisfaction at the price level of the product.	3.98
Satisfaction with the delivery service.	3.83

Table 3 Consumer satisfaction with mobile commerce applications

5. Conclusion

The adoption of mobile commerce (M-commerce) has become a growing research domain, attracting the interest of scholars worldwide (Chong, 2013; Liebana-Cabanillas, 2017; Zhang et al., 2012). This study identifies key factors influencing the adoption of mobile commerce applications, with amount of expenses emerging as a significant determinant. Additionally, consumer satisfaction with purchasing products via mobile commerce applications was found to be at a high level, with an average satisfaction score ranging from 3.50 to 4.49.

The UTAUT model was selected as the theoretical framework for this study due to its extensive application in examining technology adoption from a consumer perspective (Silas Formunyuy Verkijika, 2018). Future research should explore additional factors influencing M-commerce adoption, particularly those that resonate with consumer preferences.

Understanding these factors can help businesses retain existing customers, expand their consumer base, and refine application development strategies. Expanding the sample size and incorporating qualitative insights through open-ended questionnaire responses could provide further depth to the findings, allowing for a more comprehensive understanding of consumer adoption behavior.

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