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Factors Influencing Actual Usage of Mobile Shopping Applications: Generation Y in Thailand

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Abstract

This study examines the factors that influence the actual usage of mobile shopping applications among Generation Y (Gen Y) users in Thailand, determined by behavioral intention, compatibility, perceived cost, perceived ease-of-use, perceived usefulness, perceived risk, and personal innovativeness. The researcher carried out the analysis based on a quantitative approach and used a non-probability sampling as the convenience sampling tool. A total of 502 Gen Y respondents who experienced using the top-four ranking mobile shopping applications in Thailand were invited to participate in the study. The Structural Equation Model (SEM) and Confirmatory Factor Analysis (CFA) were used to analyze the model fit, reliability, and validity of the variables. The primary result revealed that perceived usefulness has the strongest positive significant effect on behavioral intention, followed by personal innovativeness and compatibility. Conversely, the perceived cost has a significant negative influence on behavioral intention. Besides, perceived ease-of-use has a significant positive effect on perceived usefulness. The direct relationship between perceived usefulness and behavioral intention is, however, insignificant. Similarly, the result showed no effect of perceived risk towards behavioral intention. Finally, the result also revealed that behavioral intention determined the actual usage of mobile shopping applications of Gen Y users in Thailand.

Keywords: Actual Usage, Behavioral Intention, Influencing Factors, Mobile Shopping Applications, Generation Y

JEL Classification Code: M10, M31, L81, O30

1. Introduction

The widespread mobile phone usage has become a significant phenomenon that changed the interaction among human beings over the past decades. Compared to the past, technologies and innovations are readily accepted nowadays because of their accessibility and availability. Smartphones and tablets are no longer ordinary communication devices, but they have become essential tools to carry out such

activities as surfing the internet, finding information, making transactions, among others. Therefore, the term m-commerce has become common among consumers to meet the demands of their everyday lives (Vasileiadis, 2014).

Chong (2013) defined mobile commerce (m-commerce) as the use of wireless handheld devices to conduct online transactions such as purchasing products or services, online banking, and bill payment. Although m-commerce covers various activities, they can be further classified among these three categories: mobile banking, mobile payment, and mobile shopping (Mali, 2019).

In Thailand, 93.39 million people use mobile phones, which account for 134 percent of the total population. This means that 90 percent of Thais are Internet users who access the Internet using mobile phones and spend almost five hours daily on their devices. Most of the activity that Thais do with their mobile devices is access to social networking sites, which account for 97 percent. This is followed by visiting online shopping applications that account for 58 percent (Kemp, 2020). With this in hand, the implementation of m-shopping is crucial as a form of marketing strategy as it provides customers with an alternative shopping channel

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and raises the probability of getting in more demand, which will result in high revenues. Practitioners emphasized that understanding customer behavior in marketing is the key to effective management and growth of m-shopping in the retail sector.

Today, the world's most significant generation of consumers is Generation Y or the millennials—abbreviated as Gen Y—as they account for a third of the world's population. These individuals, who were born between 1981 and 2000, grew up during the rise of the Internet and social networking era. The rising of wealth and influence of digital technology have given this community higher expectations than other generations (Amornvivat et al., 2014). Therefore, this study's primary purpose is to investigate the crucial factors influencing behavioral intention and mobile shopping application usage among Gen Y in Thailand.

2. Literature Review and Research Framework

2.1. Literature Review

2.1.1. Actual Usage (AU)

According to Kim and Kwahk (2007), actual usage refers to technology frequency usage and usage times. Based on the Technology Acceptance Model (TAM), the actual use can be determined by its intention. Hence, actual usage could also mean the intention to use technology will decide whether an individual will actually use the technology (actual usage) (Davis, 1989). Several previous studies have shown, in the same direction, that behavior intention significantly affects actual behavior. Additionally, regarding the TAM model, the behavioral intention that determines actual usage is predicted by perceived usefulness and ease-of-use. Based on Aljaaidi, Bagais, and Sharma (2020), the result also showed that behavioral intention influenced the university mobile application actual usage.

2.1.2. Behavioral Intention (BI)

Fishbein and Ajzen (1975) defined behavioral intention as the subjective possibility of a person performing intended actions. Also, behavioral intention is the product of the person's attitude towards the behavior and the subjective norm within which the behavior is performed. In the context of technology adoption, high behavioral intention represents a person's high tendency to adopt the technology, which is a critical measurement of a successful adoption.

Gerpott and Thomas (2014) reviewed the mobile Internet usage levels and determinants of repeat usage behavior. Their findings affirmed that intention was the most important predictor of m-commerce adoption and led to

the innovation's actual use. Additionally, Fagih and Jaradat (2014) confirmed that behavioral intention has a significant positive influence on the usage of m-commerce in Jordan. Thus, previous studies led to the following hypothesis:

H₁: There is a causal relationship between behavioral intention and actual usage.

2.1.3. Influencing Factors

Influencing factors refer to the variables that are considered to have causal relationships toward the user adoption intention or a decision-making process. Influencing factors are factors obtained from several fields such as psychology, social science, social psychology, ethnology, consumer behavior, communication science, and information systems (Sombutpibool, 2011). In this study, the influencing factors are discussed in the following sections.

2.1.3.1. Compatibility (COMP)

Compatibility is the degree to which technology is seen to be compatible with existing user standards. It can also be described as the extent to which technology is compliant with existing facilities and procedures (Rogers, 2003). The study of factors that act as drivers for mobile banking adoption in Jordan found that compatibility influenced consumers' mobile banking intention to use (Khraim, Shoubaki, & Khraim, 2011). Similarly, the study of Deans and Gray (2010) also determined compatibility as an important factor that influenced mobile phone users' intention to adopt mobile marketing services. From these studies, the hypothesis was formed, as shown below:

H₂: There is a casual relationship between compatibility and behavioral intention.

2.1.3.2. Perceived Cost (PC)

From the m-commerce perspective, the term perceived cost is the extent to which an individual thinks using m-commerce is expensive. It can also be indicated as the other related costs of using m-commerce, such as transaction cost, equipment cost, applications, download cost, and access cost (Wu & Wang, 2005). Rind et al. (2017) aimed at investigating the impact of perceived risk and perceived cost on Pakistani's m-commerce acceptance. The result revealed that perceived cost had a negative relationship with the intention to use; therefore, both cost and risk were considered barriers to m-commerce usage in Pakistan. In conclusion, the next hypothesis was proposed below:

H₃: There is a causal relationship between perceived cost and behavioral intention.

2.1.3.3. Perceived Usefulness (PU)

Davis (1989) defined perceived usefulness in the TAM model as the extent to which an individual believes that applying an innovation increases job performance. This definition originates from the word useful, which means the ability to be used advantageously. Rahman and Sloan (2017) confirmed that perceived risk and perceived usefulness served as influencing factors that impact m-commerce adoption in Bangladesh. Similarly, Kim and Kwahk (2007) claimed that perceived usefulness and emotion played significant roles in accounting for both the usage and intention to use m-commerce through perceived value. Similarly, Navavongsathian, Vongchavalitkul, and Limsarun (2020) mentioned that perceived usefulness directly influenced mobile banking acceptance in Thailand. Thus, the hypothesis was formed below:

H₄: There is a causal relationship between perceived usefulness and behavioral intention.

2.1.3.4. Perceived Ease-of-Use (PEOU)

Rogers (1962) identified perceived ease-of-use as a term that represents the degree to which an innovation is perceived to be not hard to understand, learn, or operate. According to Venkatesh and Davis (2000), perceived ease-of-use influences perceived usefulness. Yang (2010) explained that if the users experience accessing m-shopping sites using their phones, it could lead to the attainment of their shopping goals. Yang explained further that a user-friendly m-shopping website lets customers believe that m-shopping is useful and enhanced their buying experience. Numerous studies provided empirical support for a positive relationship between perceived ease-of-use and perceived usefulness in new IT adoption (Chen, 2008; Kim & Kwahk, 2007). Cheong and Park (2005) supported the hypothesis that perceived ease-of-use has a significant relationship with behavioral intention. Additionally, perceived ease-of-use has been empirically investigated and it was found to have a significant impact on behavioral intention in various contexts (AlSoufi & Ali, 2014; Crabbe, Standing, Standing, & Karjaluoto, 2009; Le, Ngo, Trinh, & Nguyen, 2019). From these studies, the following hypothesis was proposed:

H₅: There is a causal relationship between perceived ease-of-use and perceived usefulness.

H₆: There is a causal relationship between perceived ease-of-use and behavioral intention.

2.1.3.5. Perceived Risk (PR)

Bauer initially introduced perceived risk in 1960, in which he defined risk as uncertainty and consequence connected with consumers' actions.

Several studies have demonstrated the relationship between perceived risk and behavioral intention. Choi, Lee, and Ok (2013) affirmed that consumers' perceived risk affected consumers' attitudes and behavioral intention in buying street foods. Belkhamza and Wafa (2009) showed that perceived risk was negatively correlated with behavioral intention to use services from a tourism organization, which explained that the higher the system risk in a tourism organization is, the less likely the managers will use e-commerce. Given these facts, the proposed hypothesis was formed:

H₇: There is a causal relationship between perceived risk and behavioral intention.

2.1.3.6. Personal Innovativeness (PI)

Personal innovativeness can be defined as the extent to which people can adopt new technology comparatively faster than other social system participants (Rogers, 2003). Limayem, Khalifa, and Frini (2000) used TPB in investigating the consumers' behavior toward Internet shopping, intention to use, and actual use. The study showed a robust relationship between these two constructs demonstrating that personal innovativeness impacts behavioral intention. Eastlick and Lotz (1999) developed a model that included personal innovativeness traits and found that those who scored high in public leadership-innovative scales were more willing to decide to buy items than those scoring lower on the same measure. Thus, this leads to the next hypothesis that is shown below:

H₈: There is a causal relationship between personal innovativeness and behavioral intention.

2.2. Research Framework

The theoretical and conceptual frameworks describe the path of the study, create the ground theory and construct the variables. The framework's overall purpose is to make the study results more relevant, accessible to theoretical constructs in research and promote generalization (Adom, Hussein, & Agyem, 2018).

Figure 1 displayed all causal relationships among variables and analyzes the factors that influence behavioral intention and the actual usage behavior towards m-shopping applications among Gen Y in Thailand. The conceptual framework variables include actual usage, behavioral intention, compatibility, perceived cost, perceived usefulness, perceived ease-of-use, perceived risk, and personal innovativeness.

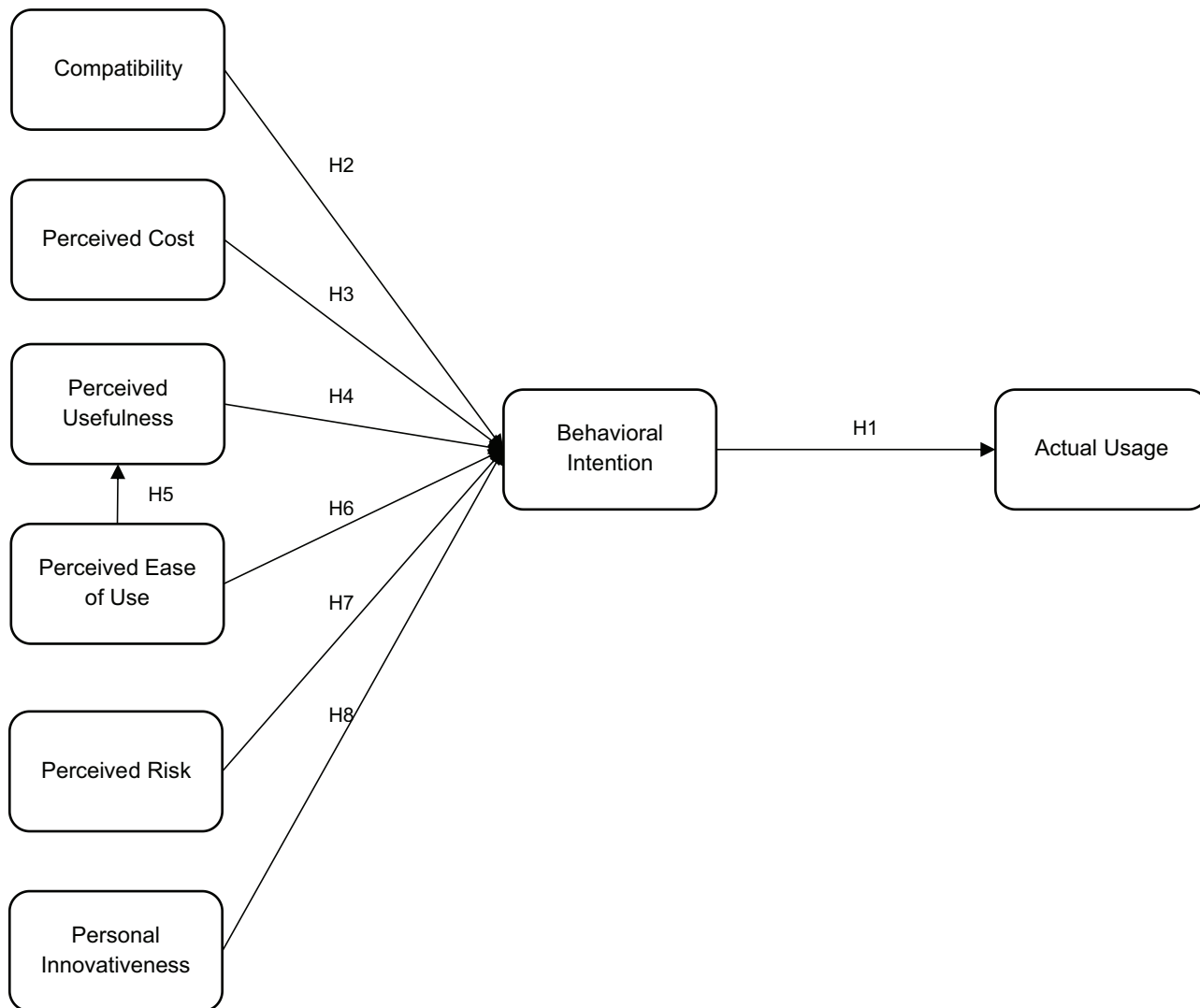


Figure 1: Research Model

3. Methodology

The researcher applied the quantitative method and the non-probability sampling method. Non-probability is one of the sampling procedures that does not provide any bias for any decision on the possibility that elements in the universe will have a chance to be included in the test sample (Etikan & Bala, 2017). A questionnaire was used as the primary tool and was distributed offline to the target groups. This present study’s sample unit are Thais, who were born during 1981-2000 (Gen Y or Millennials) and must have experienced using the top-four ranking mobile shopping applications in Thailand.

The questionnaire consisted of five main parts. The first part was the screening question in which closed or fixed

alternative questions were used. The second and third part aimed at measuring the independent variables and mediator variables in the study. Measuring the dependent variables fall in the fourth part of the questionnaire. In order to measure the variables, a 7-point Likert scale was applied. Lastly, the fifth part was to identify the respondents’ demographics, including their gender, age, level of education, occupation, and level of income.

In the pilot test, 50 questionnaires were distributed to test the reliability of the questionnaire. By doing so, Cronbach’s Alpha method was used as a tool. After the reliability test, the questionnaire was given to the actual 500 respondents. The measurement models purposely measure the validity of the variables and investigate the interrelationship among the variables. In the measurement model, to test the

convergent validity, Confirmatory Factor Analysis (CFA) was conducted. Finally, Structural Equation Model (SEM) was applied to test the overall model and investigate the variables' effects.

3.1. Population and Sample Size

This present study's population is Thai Gen Y, who have experienced using the top four-ranking mobile shopping applications in Thailand. The sample size suggestions for SEM depend on the model's complexity; however, Kline (2011) suggested that at least 200 respondents should be invited to participate in the study. In this present research, the questionnaire was distributed to 513 respondents, in which 502 responses were finally considered.

3.2. Sampling Technique

In this present research, the survey was distributed offline to target respondents using the non-probability sampling method. Firstly, the purposive or judgmental sampling was applied as the respondents must belong to Gen Y, who have experienced using top-four mobile shopping applications only. Additionally, the respondents were classified using quota sampling. The allocation of sample size was defined

according to the estimated monthly mobile distribution. As shown in Table 1, quota sampling was applied, and the number of questions was distributed according to the sample size. Finally, for those respondents who matched the criteria mentioned, the last procedure was to apply convenience sampling to distribute the questionnaire according to respondents' willingness and time availability.

3.3. Pilot Test

The pilot test was a questionnaire check with the questionnaire being distributed to a small group of participants from the same target population in order to classify and address the questionnaire's significant problems (Malhotra, Nunan, & Birks, 2007). In order to test the reliability of each variable, Cronbach's Alpha analysis was used. The researcher then randomly assigned questionnaires to 50 participants or 10% (Connelly, 2008) from the main study, similar to the target population. Hair, Black, Babin, and Anderson (2010) suggested that the alpha value should be 0.07 threshold. As a result, the questionnaire was considered reliable as the alpha results were all above 0.07. The pilot test result is shown in Table 2, and the alpha value is in the range of 0.706 – 0.904, with the strength of association from acceptable to excellent.

Table 1: Top-Four Ranking Mobile Shopping Visit Allocation

Top 4 Shopping online	Estimated Monthly Visit through desktop and mobile (Million)	Estimated Monthly Mobile Distribution (Million)	Percentage Allocation	Questionnaire Allocation
First-Rank	41.93	23.44	60.66%	305
Second- Rank	28.49	13.47	34.86%	174
Third- Rank	1.952	0.92	2.38%	12
Fourth- Rank	1.716	0.81	2.10%	11
Total				502

Table 2: Reliability Test Results (Consistency of The Scales Test N=50)

Variables	Source of Questionnaire (Measurement Indicator)	No. of Item	Cronbach's Alpha	Strength of Association
Actual Usage (AU)	Aldholay, Isaac, Abdullah, Abdulsalam and Al-Shibami (2018)	2	0.765	Acceptable
Behavioral Intention (BI)	Moorthy et al. (2016)	6	0.904	Excellent
Compatibility (COMP)	Rogers (2003)	4	0.858	Good
Perceived Cost (PC)	Moorthy et al. (2016)	5	0.861	Good
Perceived Ease-of-Use (PEOU)	Deb and Lomo-David (2014)	7	0.738	Acceptable
Perceived Risk (PR)	Wu and Wang (2005)	4	0.765	Acceptable
Perceived Usefulness (PU)	Rahman and Sloan (2017)	6	0.841	Good
Personal Innovativeness (PI)	Lu, Yao, and Yu (2005)	4	0.706	Acceptable

4. Results and Discussion

4.1. Demographic Factors

In this present study, most of the respondents were female, which accounted for 73.9 percent of the total number of respondents. As to age, this present study focused only on Gen Y; thus, the respondents were divided among the following age groups—26-30 years old (52.2%); 31-35 years old (28.5%), 21-25 years old, (14.5%), and 36-40 years old (5.8%).

The primary educational levels obtained by the respondents are bachelor's degree (55.4%), diploma and secondary school or equivalent 106 (21.1%) and 100 (19.9%), respectively; master's degree (1.6%), doctoral degree (0.8%) and others (1.2%).

Furthermore, the majority of the respondents work as private company employee (29.7%), self-employed (24.3%); state enterprise officers (19.9%); government officers (18.3%) and 15 students (3.0%). Other than the mentioned groups, 4.8% are either unemployed, freelancers, merchants and agriculturists.

Regarding the monthly income, majority of the respondents earned about 15,001-25,000 per month (49.8%); 25,001-35,000 baht (25.7%); below 15,000 baht (20.3%); 45,001-55,000 baht (2.0%); 35,001-45,000 baht (1.6%); and 55,001-65,000 baht (0.6%).

4.2. Confirmatory Factor Analysis (CFA)

The Confirmation Factor Analysis (CFA) was first applied to assess the measurement model's convergent and discriminant validity (Jöreskog, 1969) and determined by the factor loading, Composite Reliability (CR), and the

Average Variance Extracted (AVE). The factor loading value should be 0.5 thresholds ($t > 1.96$) (Hair et al., 2010). During the CFA analysis, the measurement items of perceived ease-of-use, perceived usefulness, and personal innovativeness were eliminated from 7, 6 and 4 to become 6, 5 and 3, respectively, due to low factor loading (< 0.5). Consequently, the total measurement item of 38 was changed to 35 items for SEM analysis. As suggested by Hair et al. (2010), CR should be greater than 0.7 and AVE is 0.5 threshold. AVE value of perceived usefulness and actual usage was below 0.5 (0.474 and 0.489). However, if AVE is lower than 0.5 but CR is greater than 0.6, the construct's convergent validity is still acceptable (Fornell & Larcker, 1981). Also, other items met the suggested criterion, as showed in Table 3. The discriminant validity was also supported as each AVE's square root was higher than the covariance relation of variables (Table 4). The results in Table 5 indicate the model fit in which all values met all indices. Therefore, it indicated that the hypotheses of this research are adequately suitable for the study.

4.3. Structural Equation Model (SEM)

Jöreskog and Sörbom (1993) defined the structural equation modeling (SEM) as an equation that uses an observed variable and latent variable analysis parameters. As a result, the result followed the model fit indices, in which Chi-Square (CMIN) equaled to 2.900, Goodness-of-Fit Index (GFI) was 0.853, Adjusted Goodness of Fit Index (AGFI) was 0.824, Normed Fit Index (NFI) was 0.912, Comparative Fit Index (CFI) was 0.941, Turker Lewis Index (TLI) was 0.933, and Root Mean Square Error of Approximation (RMSEA) was 0.063.

Table 3: Confirmatory Factor Analysis (CFA), Composite Reliability (CR), and Average Variance Extracted (AVE) Results

Variables	Factors Loading	CR	AVE
Actual Usage (AU)	0.836 - 0.946	0.979	0.474
Behavioral Intention (BI)	0.881 - 0.926	0.965	0.823
Compatibility (COMP)	0.883 - 0.914	0.946	0.816
Perceived Cost (PC)	0.885 - 0.942	0.964	0.841
Perceived Ease-of-Use (PEOU)	0.730 - 0.895	0.885	0.609
Perceived Risk (PR)	0.667 - 0.916	0.907	0.713
Perceived Usefulness (PU)	0.518 - 0.788	0.823	0.489
Personal Innovativeness (PI)	0.862 - 0.907	0.920	0.597

Note: CR = Composite Reliability, AVE = Average Variance Extracted.

*** = Significant at the 0.05 significant levels ($p < 0.05$).

Table 4: Discriminant Validity

Correlation	COMP	PC	PEOU	PR	PU	PI	BI	AU
COMP	0.90							
PC	0.242	0.92						
PEOU	0.136	-0.202	0.78					
PR	-0.020	0.414	-0.036	0.84				
PU	0.416	0.109	0.263	0.093	0.70			
PI	0.329	0.086	-0.053	-0.009	0.403	0.77		
BI	0.366	0.202	0.066	0.097	0.542	0.395	0.91	
AU	0.375	0.036	-0.024	-0.003	0.285	0.361	0.262	0.69

Note: The diagonally listed values are the AVE square roots of the variables.

Table 5: Goodness of Fit

Goodness-of-Fit Indices	Criteria	Results of this Study
Chi-Square (CMIN)	< 3.00 (Hair et al., 2010)	2.979
Goodness-of-Fit Index (GFI)	> 0.80 (Doll, Xia, & Torkzadeh, 1994)	0.848
Adjusted Goodness of Fit Index (AGFI)	> 0.80 (Segars & Grover, 1993)	0.817
Normed Fit Index (NFI)	> 0.90 (Bentler & Bonnet, 1980)	0.910
Comparative Fit Index (CFI)	> 0.90 (Bentler, 1990)	0.938
Turker Lewis Index (TLI)	> 0.90 (Bentler & Bonett, 1980)	0.930
Root Mean Square Error of Approximation (RMSEA)	< 0.08 (MacCallum, Browne, & Sugawara, 1996)	0.063

Note: CMIN/DF = The ratio of the chi-square value to the degree of freedom, GFI = Goodness-of-Fit Index, AGFI = Adjusted Goodness-of-Fit Index, NFI = Normalized Fit Index, CFI = Comparative Fit Index, TLI = Tucker-Lewis index, and RMSEA = Root Mean Square Error of Approximation.

4.4. Research Hypothesis Testing

The hypotheses testing results show that H_1 , H_2 , H_4 , H_5 , H_6 , and H_8 are supported, whereas H_3 and H_7 are not supported.

H_1 : The standardized path coefficient between behavioral intention and actual usage was 0.255 (t-value = 5.747***). It implies that behavioral intention has a significant effect on actual usage; therefore, H_1 was supported, consistent with several studies. Fishbein and Ajzen (1975) indicated that behavioral intention is the primary predictor of actual usage. Behavioral intention is a probability or a measurement of strength if an individual intends to perform a particular behavior or usage. Therefore, high behavioral intention represents the high tendency of technology adoption. Gerpott and Thomas (2014) affirmed that intention is the most critical predictor of m-commerce adoption, leading to innovation's actual use. Additionally, Fagih, and Jaradat

(2014) inspected perceived usefulness and perceived ease-of-use to explain the adoption intention of m-commerce in Jordan and to study the moderating role of gender and individualism-collectivism to measure the adoption at the individual level. The finding also confirmed that behavioral intention had a significant positive influence on the usage of m-commerce in Jordan.

H_2 : The standardized path coefficient between compatibility and behavioral intention was 0.109 (t-value = 2.347*). It implies that compatibility has a significant effect on behavioral intention; therefore, H_2 was supported. This present study's result was aligned with Khraim et al. (2011), which also found that compatibility played a significant role in consumers' mobile banking intention to use in Jordan. Similarly, Deans and Gray (2010) found that compatibility was one of the factors that determined consumer decision intention to adopt mobile marketing. Besides having a positive relationship with the intention, compatibility

also has a strong relationship with perceived usefulness, perceived ease-of-use, and credibility. Thus, people who consider m-banking to fit their lifestyle and find it an appropriate solution can find a useful service that is easy to use and reliable (Koenig-Lewis, Palmer, & Moll, 2010).

H₃: The standardized path coefficient between perceived cost and behavioral intention was 0.094 (t-value = -1.963*). Perceived cost negatively affected behavioral intention; therefore, H₃ was supported. Numerous studies have examined the relationship between perceived cost and behavioral intention. Rind et al. (2017) aimed to investigate the impact of perceived risk and perceived cost on Pakistani's m-commerce acceptance. The result revealed that perceived cost had a negative relationship with the intention to use; therefore, both cost and risk were considered barriers to m-commerce usage in Pakistan. Anil, Ting, Moe, and Jonathan (2003) also showed that perceived cost negatively affected behavioral intention in Singapore's m-commerce adoption.

H₄: The standardized path coefficient between perceived usefulness and behavioral intention was 0.471 (t-value = 8.453***). It shows that perceived usefulness has a significant effect on behavioral intention; therefore, H₄ was supported. This present study's result aligned with Rahman and Sloan (2017), which studied m-commerce adoption in Bangladesh; the finding confirmed that perceived risk and perceived usefulness were the most influential factors impacting m-commerce adoption. Kim and Kwah (2007) revealed that perceived usefulness and emotion played a significant role in both usage and intention to use through perceived value. Zhang, Zhu, and Liu (2012) aimed to discover the general factors that influence m-commerce adoption and their results showed that perceived usefulness impacted behavioral intention in eastern culture.

H₅: The standardized path coefficient between perceived ease-of-use and perceived usefulness was 0.300 (t-value = 5.546***). This implies that the perceived ease-of-use significantly affected perceived usefulness; therefore, H₅ was supported. Similarly, Chen and Barnes (2007) also discovered that perceived usefulness and perceived ease-of-use significantly affected behavioral intentions. According to Venkatesh and Davis (2000), perceived ease-of-use influences perceived usefulness. Yang (2010) explained that if the users experience accessing m-shopping sites using their phones, it could lead to the shopping goal success. Yang explained further that a user-friendly m-shopping website allows customers to believe that m-shopping is useful, consequently enhancing their buying experience. Numerous studies provided empirical support for the positive relationship between perceived ease-of-use and perceived usefulness on new IT adoption (Chen, 2008; Kim & Kwahk, 2007).

H₆: The standardized path coefficient between perceived ease-of-use and behavioral intention was -0.027 (t-value = -0.574). This means that there was no significant effect between perceived ease-of-use and behavioral intention. Therefore, H₆ was not supported. Several studies revealed that perceived ease-of-use has an impact on behavioral intention. However, some research explained it differently. Khalifa and Shen (2008) showed that the direct effect of perceived ease-of-use on behavioral intention was not significant. However, only the indirect effect mediated through perceived usefulness was significant. Barry and Jan (2018) also confirmed that perceived ease-of-use had an insignificant influence on behavioral intention to use m-commerce.

H₇: The standardized path coefficient between perceived risk and behavioral intention was 0.032 (t-value = 0.691). It implies no significant effect between perceived risk and behavioral intention; therefore, H₇ was not supported. Taylor (1974) explained that people who perceive risks might develop possible anxiety, which in turn affects their decision process. In this present study, however, perceived risk was found not to affect the behavioral intention. AlSoufi and Ali (2014) revealed that perceived risk has no effect on behavioral intention, but indirect relation existed through perceived ease-of-use and perceived usefulness. Duggal and Gupta (2020) explained similarly, which indicated that perceived risk has no direct effect on behavioral intention.

H₈: The standardized path coefficient between personal innovativeness and behavioral intention was 0.255 (t-value = 5.747***). It implies that personal innovativeness has a significant effect on behavioral intention. Therefore, H₈ was supported and revealing the same result as Boyle and Ruppel (2006), which indicated that personal innovativeness determined the online purchasing intention. Consistent with Lu (2003), which showed that personal innovativeness positively affected continuance intention toward m-commerce. Also, Limayem et al. (2000) linked personal innovativeness and behavioral intention directly. The link showed the significant relationship between these two constructs.

4.5. Direct, Indirect, and Total Effects of Relationships

Direct and indirect effects, frequently found in mediation analysis, are essential to several applied social sciences (Hyman, 1955; MacKinnon, 2008). The direct effect means the research model works on without the mediator variable. The indirect effect describes the relationship between two variables mediated by at least one factor (Raykov

& Marcoulides, 2000). This present research has eight variables: five independent variables, two mediators, and one dependent variable. The results of all the relationships are clarified as follows.

4.5.1. Actual Usage

Actual usage is a dependent variable in this present study—the only significant direct effect of behavioral intention on actual usage was 0.278. Additionally, four variables had a significant indirect impact on actual usage, included compatibility, perceived cost, perceived usefulness, and personal innovativeness, with the significant indirect value equaled to 0.030, -0.026, 0.131, and 0.071, sequentially. Furthermore, two variables had an insignificant effect on the actual usage; perceived ease-of-use and perceived risk equaled 0.032 and 0.009.

4.5.2. Behavioral Intention

Behavioral intention is a mediator in this present study in which four variables significantly impacted behavioral intention, and two independent variables have an insignificant effect on behavioral intention. The first independent variable that significantly directly influenced behavioral intention was compatibility with the value placed at 0.109, followed by the perceived cost and personal innovativeness at the significant effect valued at -0.094 and 0.255, respectively. As a mediator, perceived usefulness had a significant effect on behavioral intention valued at 0.471. However, perceived ease-of-use and perceived risk had an insignificant impact on behavioral intention. Perceived ease-of-use had both direct and indirect insignificant impact on the behavioral intention, with the value placed at -0.027 and 0.141, respectively. Hence, the total insignificant effect was 0.114. Similarly, there was an insignificant direct effect of perceived risk on behavioral intention, which equaled to 0.032.

4.5.3. Perceived Usefulness

Perceive usefulness in this present study plays a significant role as it serves as one of the mediator variables. Only perceived ease-of-use was significantly directly affected at 0.300 without an indirect relationship on perceived usefulness.

5. Conclusion, Recommendation, and Limitation

5.1. Conclusion

This present research has investigated the factors that affect the behavioral intention of Gen Y consumers towards

the actual usage of m-shopping applications in Thailand. A total of 502 Gen Y consumers who experienced using the top-four ranking mobile shopping applications in Thailand have been invited to participate in this present study. The conceptual framework was developed from the previous studies to investigate all hypotheses, including actual usage, behavioral intention, compatibility, perceived ease-of-use, perceived cost, perceived risk, perceived usefulness, and personal innovativeness. CFA was the tool used to assess the convergent and discriminant validity of the measurement model. SEM was applied to test the effect of measured variables and conclude the research.

In this present research, behavioral intention has positively and significantly influenced the actual usage of m-commerce applications. The behavioral intention was significantly affected by compatibility, perceived cost, perceived usefulness, and personal innovativeness. Perceived ease-of-use significantly impacted perceived usefulness, while conversely, perceived ease-of-use and perceived risk have no significant impact on behavioral intention.

Fishbein and Ajzen (1975) implied that behavioral intention predicts actual usage. Therefore, this indicates that millennials who have a high level of intention to use mobile shopping applications finally lead to their actual usage (H_1).

In this present study, compatibility has a significantly positive impact on behavioral intention (H_2), which is consistent with several previous studies. Koenig-Lewis et al. (2010) revealed that compatibility has the most substantial positive impact on banking services' behavioral intention. It can be identified that if users feel that adopting new technology is compatible with their lifestyles or experiences, they will adopt that technology quickly. Thus, this generation of consumers intends to use mobile shopping applications to view m-shopping applications as compatible with their current beliefs, ideals, lifestyles, and past experiences.

Additionally, several studies indicated that perceived costs could constitute a significant obstacle to mobile commerce adoption (Kleijnen, Wetzels, & Ruyter, 2004; Wu & Wang, 2005). The researchers hypothesized a significant causal relationship between perceived cost and behavioral intention to use (H_3), and the result supported this hypothesis showing their negative relationship. It implies that lower costs in using m-shopping applications could motivate users to use those applications.

Hypothesis 4 (H_4) proposed that perceived usefulness significantly impacts behavioral intention, consistent with numerous studies (Riquelme & Rios, 2010; Tan, Chong, Loh, & Lin, 2010). Awasthi and Sangle (2013) indicated that the intention to use mobile banking is mainly influenced by its perceived usefulness. Thus, if users believe that using m-shopping application is beneficial to them, they may increase their use. Conversely, if the perceived usefulness

is negative, users would possibly give up using those applications and seek more user-friendly ones.

Furthermore, perceived ease-of-use has a significant relationship with perceived usefulness. Perceived usefulness is determined by perceived ease-of-use because if users feel that the new technology is more useful, they also perceive it to be easier to use (Venkatesh & Davis, 2000). Therefore, simple access to m-shopping applications would help users reach their shopping objectives (H_3).

Surprisingly, there was no significant direct effect of perceived ease-of-use on behavioral intention (H_6), contrary to the TAM model by Davis (1989). The possible reason for this is that the group of respondents belongs to Gen Y, who is adept with technology; therefore, the ease-of-use or difficulty level using the applications might not affect their intention to use.

The result also revealed no significant causal relationship between perceived risk and behavioral intention (H_7), which contradicts several studies. However, this present study works in accordance with the studies of AlSoufi and Ali (2014) and Ankar, Carlsson, and Walden (2003), who found no relationship between perceived risk and behavioral intention. This is in a way possible as Gen Y is deemed to be risk-takers, in which using m-shopping applications may not pose any risks to them.

Finally, personal innovativeness has a significant impact on behavioral intention (H_8) (Limayem et al., 2000). Gen Y can be described as a generation of innovation. Gen Y users who have personal innovativeness traits can accept a high uncertainty level in using new technology (Rogers, 1995), making them more willing to use the m-shopping application as a new channel to match their lifestyles.

5.2. Recommendations

This present study has various theoretical and practical implications. The findings identified the factors influencing the behavioral intention of Gen Y to their actual usage of m-shopping applications in which online retailers should be mindful about. One essential factor that strongly influences behavioral intention to adopt an m-shopping application is perceived usefulness. Providers should customize applications that match with users' interests and needs individually. In other words, users should feel that adopting an m-shopping application is useful for them, which helps them make their lives easier. This then leads to the intention of purchasing products through mobile applications than going to physical stores. Besides, Segars and Grover (1993) explained that if users feel that using technology is easy enough, they perceive it as useful and, consequently, intend to adopt the technology. By designing the programs or applications to be user-friendly, the concept of ease-of-use is achieved, which makes users feel effortless to acquire innovative applications. In turn, they

perceive that the applications are useful for them and urge themselves to use it.

Personal innovativeness is also one of the critical factors affecting users' intention to use m-commerce (Slade, Williams, Dwivedi, & Piercy, 2015). Hence, marketers should consider segmenting the market based on users' innovativeness, and they should be initially targeted. Furthermore, compatibility is one of the significant factors influencing behavioral intention; thus, marketers should apply personalized marketing to meet users' needs individually (Simonson, 2005). When users feel that using an m-shopping application is compatible with their lifestyles, they are more likely to shop more through this channel (McKenzie, 2001). From the m-commerce perspective, the term perceived cost refers to the extent to which an individual thinks using m-commerce is expensive (Wu & Wang, 2005). As perceived cost is one of the barriers of m-shopping, the application providers should develop the applications that make users feel that adopting this channel will gain tremendous value. Moreover, users would consider using this channel if they feel that it is cheaper than going out shopping in physical stores.

5.3. Limitation and Further Study

Although this present research's findings indicated implications for executives and management teams, it could be further enhanced by resolving many limitations. First, this present research emphasized only the users of m-shopping applications and focused explicitly on top-four ranking applications in Thailand. Hence, the findings cannot be generalized to users in other applications and other platforms (e.g., online channels, traditional channels, and social media shopping channels). Second, in this present study, non-users of m-shopping applications were not included. Further studies might focus on non-users in order to understand their possible usage barriers. Third, the researcher focused on Gen Y users; therefore, the findings cannot be generalized to other generations. To broaden the study by investigating the other generations would be more beneficial as it can be more generally applied. Even though the respondents' age, experiences, and utilitarian aspects were considered in this present study, the gender, hedonic (love, hate, fear, joy, boredom), psychological variables (lifestyle, personality, and social influence) were not sufficiently examined. Additionally, further studies should apply qualitative analysis (focus group, interview, observation) or consider a mixed-method approach that includes both qualitative and quantitative research methods for a more reliable and more in-depth investigation. Lastly, the current study was conducted in Thailand, but rural and urban shoppers' perspectives may be different, thus further studies that specific geographic areas pose to be beneficial and informative.

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