Influential Factors of Usage Behavior of Potential Hypertension Patients to Use Personal Health Assistant Service and Technology in a Private Hospital in Bangkok

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Abstract

Purpose: The study aims to investigate the determinants of behavioral intention toward using personal health assistant services and technology for potential hypertension patients in a private hospital in Bangkok. The developed conceptual framework contains perceived usefulness, perceived ease of use, attitude toward using, customer satisfaction, social influence, facilitating condition, behavioral intention, and usage behavior. **Research design, data, and methodology:** 500 participants involved in this study, applying purposive, stratified random, and convenience samplings. To assess content validity and reliability test, the index of item objective congruence (IOC) and Cronbach's Alpha coefficient value (pilot testing) of 50 samples were conducted. The research applied statistical method, using confirmatory factor analysis (CFA) and structural equation modeling (SEM). **Results:** Perceived ease of use significantly influences attitudes toward using. Attitude toward use has a significant influence on customer satisfaction but has no significant influence on behavioral intention. Social influence and facilitating conditions significantly influence behavioral intention. Furthermore, behavioral intention significantly influences usage behavior. Nevertheless, perceived usefulness has no significant influence on attitude toward use. **Conclusions:** The leading enterprises in healthcare industry should push effort more than even to redefine health technology by moving to the value-based care model for patients, considering significant factors enhancing usage behavior.

Keywords: Customer Satisfaction, Social Influence, Facilitating Condition, Behavioral Intention, Usage Behavior

JEL Classification Code: E44, F31, F37, G15

1. Introduction

In Thailand, the market value of the health tech is principally a "business-to-business (B2B) services", which are mainly accessible among prime hospitals and feature technologies such as "an appointment system via mobile application", "telemedicine system" and "medical robots". When comparing with small and medium enterprises (SMEs), the large percentage of private investment in health tech derived from key players due to these healthcare service providers potentially gains investments and advantages in the technology adoption. The implementation of technology

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of SMEs in the health sector are far behind the trend of health tech systems, which obstruct them to have market opportunity in reaching their clients or patients. The healthcare platform or mobile application can provide consumers with accessibility, health safety and cost saving in receiving telemedicine and medical prescriptions via online platform. Therefore, health tech provides more and more the medical services from "business-to-consumer or B2C" (KResearch, 2021).

According Global Data (2020), Thailand focuses on digitalization in responding to Thailand's 4.0. The digital transformation is to take part and encourage the technology adoption in the wellness sector which significantly and progressively impact to the country's digital economy. In regard to Thailand 4.0 policy during 2018–2020, the government established numerous health system and applications such as H4U (personal health profile app), Smart Health ID (patient administration cloud service) and Primary Care Cluster App (telehealth and telemedicine).

The research believes that technology adoption is much more than integrated and service-based healthcare model. It should be emphasized in behavioral change, relationships management, and optimization of the purchase. The development of online or remote tools in the digital healthcare have been not yet flourished. The availability of remote assistants' system is plenty but not much in responding the specific needs of consumers. Personal/virtual assistants can be such an affordable option while it can encapsulate high-quality service. The advantages are obviously seen in operational excellence where the cost of manpower has been reduced. However, it requires high-skilled professionals in developing and upgrading the service system at all time (KResearch, 2021).

KResearch (2021) mentioned that the health tech products and services are still relatively unsophisticated in the Thai market. Consumers are not yet confident about the safety and cost for the health system and technology. The study aims to investigate the determinants of behavioral intention toward using personal health assistant services and technology for potential hypertension patients in a private hospital in Bangkok. The developed conceptual framework contains perceived usefulness, perceived ease of use, attitude toward using, customer satisfaction, social influencing, facilitating condition, behavioral intention, and usage behavior.

2. Literature Review

2.1 Perceived Usefulness

The TAM theorizes that perceived usefulness is a significant factor that drives user's adoption of any new innovation or technology (Davis, 1989). Acceptance is explained as an individual's motivation to complete required tasks. Therefore, perceived usefulness is "the extent to which an individual believes that applying certain technology will improve job performance" (Tubaishat, 2017). Perceived usefulness is generalized as "an individual's belief that technology usage could improve his/her job performance" (Nguyen et al., 2020).

Perceived usefulness is clarified as an individual's belief in implementing a technology will improve his/her job performance. In opposite, he/she would refuse to use if such technology is not useful which, in turns, perceived usefulness can predict the positive or negative attitude toward using a technology. A significant relationship between perceived usefulness and attitude toward use has been affirmed by many scholars (Cho & Fiorito, 2009; Hampshire, 2017; Kotler, 2015; Marakarkandy et al., 2017; Rezaei et al., 2015). In healthcare context, the perception of the benefits from using online health service could influence the attitude toward use (Didyasarin et al., 2017; Lin & Chang, 2011). Hence, this study proposes:

H1: Perceived usefulness has a significant influence on attitude toward using personal healthcare assistant service.

2.2 Perceived Ease of Use

Perceived ease of use conceptualizes perception of an individual relating to certain technology being easy to use (Davis, 1989). It provides measurement scales which explain strong psychological assessment on technology usage context (Dünnebeil et al., 2012). Perception of users correlates with cognitive and emotion aspects on the level of effort to use the system so it has been conducted to significantly impacted both positive or negative attitude toward the use of such system. Perceived ease of use is strongly believed that it can completely impact the intention to use particular technology (Hsiao & Tseng, 2020).

Lin and Chang (2011) assessed self-service technology adoption, using TAM to measure the significant association between perceived ease of use and attitude toward use towards behavioral intention. Didyasarin et al. (2017) proposed a research model and explained the importance to perceived ease of use as a powerful factor contributing to attitude toward using health care mobile application services. The result was that perceived ease of use positively impacted attitude toward using a technology. Based on previous studies, a hypothesis is set:

H2: Perceived ease of use has a significant influence on attitude toward using personal healthcare assistant service.

2.3 Attitude Toward Using

Attitude is widely conceptualized in social and psychological studies which dimensionally divide in three aspects (Ardies et al., 2013). The traditional dimensions are reported by Fishbein and Ajzen (1975) which includes cognitive, affective, and behavioral aspects. Metsärinne and Kallio (2015) added that attitude is formed as social theories which explain how the brain would function in the emotional level. When it is related to the use of the technology, attitude can determine whether an individual would have intention or use the new system.

Customer satisfaction, as an outcome of user's comparison of specific technology, would serve user's expectation (Kotler, 2015). Lee et al. (2015) suggested that consumer satisfaction conveys total emotional reception to the overall service experience of using a technology which was affirmed with many scholars. For instance, Lin and Chang (2011) who studied a use of a network system found the significant relationship among attitude toward using a system and user satisfaction. The user's attitude positively impacted satisfaction towards behavioral intention in job bank web sites in Taiwan (Lee, 2009).

Consumers with positive attitudes about the technology will be driven by such intrinsic emotion to build behavioral intention to use it. Thus, the significant relationship between attitude toward use and behavioral intention is attained (Dabholkar & Bagozzi, 2002). Besides, users with favorable attitude tend to express readiness and willingness to engage with a technology if they believe such technology could serve their goals (Kleijnen et al., 2004). Therefore, previous literatures lead to hypotheses of this study per below:

H3: Attitude toward using has a significant influence on customer satisfaction on personal healthcare assistant service.
H4: Attitude toward using has a significant influence on behavioral intention of personal healthcare assistant service.

2.4 Customer Satisfaction

Customer satisfaction is stated as the expression of customers when they achieve their needs and expectation by using a product, service or technology. Hence, they tend to repurchase or reuse such things (Brown, 1992). Customer satisfaction is an emotional state that a customer ties with the products or services, whether those can fulfill their requirements (Andaleeb & Conway, 2006). In marketing study, the satisfaction procedure is critical to design sales and marketing strategies in order to achieve sales revenue (Kandampully & Suhartanto, 2000). Satisfied customer can be easier to retain than a dissatisfied one. Thus, most organizations invest time and effort to measure the satisfaction of their customers (Choi & Kim, 2011), and to

maximize the profit and organizational performance (Barsky & Nash, 2003).

2.5 Social Influence

Social influence is a major factor on UTAUT model and has been determined as a driver of intention to use and usage behavior of a new technology. Social influence plays a primary role in the decision-making process to adopt a new system or technology which incurs the inner motivation of behavioral options driven by the third party (Cho et al., 2015; Cialdini, 2003) and it has viewed as a complex. Maloney et al. (2013) posited two ways of social influence that can determine good and bad impact to a person's reaction (social rewards or threatening sanctions). Some digital technology has been adopted through a socializing with friends, family and acquaintances in user's community (Vroman et al., 2015).

In healthcare context, the social influence is critical as the decision to use a medical service enquires the strong convincing by the people they close and trust as it could have a huge effect on a person's health and well-being (Hülür & Macdonald, 2020). Giovanis et al. (2019) clarified a social influence as a predictor of behavioral intention that opinions or feedbacks from peers, family and friend could drive a decision making and willingness to use particular technology. Alalwan et al. (2017) who conducted the study in Bangladesh revealed that social influence directly affected intention to use mobile health services. Developing from the support literature, the following hypothesis is obtained:
H5: Social influence has a significant influence on behavioral intention of personal healthcare assistant service.

2.6 Facilitating Condition

Facilitating conditions are "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system". In an extension of TAM, facilitating conditions is similar to perceived resources available which involves information, hardware and software infrastructure, data time, monetary resources, manpower support and documents (Mathieson et al., 2001). Facilitating conditions is an external variable around the technology which haven't been investigate much in its components.

Despite of facilitating condition potentially drive the willingness of users to use a technology, many researchers have studied the significant impact among them in order to examine technology adoption. These two variables are essential in UTAUT model developed by Venkatesh et al. (2003). Therefore, the research applied UTAUT and discussed on the significant impact between facilitating

condition and behavioral intention to use personal health assistant service in a private hospital in Thailand. Subsequently, the above reports produce a following hypothesis:

H6: Facilitating condition has a significant influence on behavioral intention of personal healthcare assistant service.

2.7 Behavioral Intention

Behavioral intention is described as "the strength of one's intention to perform a specified behavior" (Venkatesh et al., 2003). In healthcare context, behavioral measures "the willingness of user to perform or not perform health-care activities using technology-based services". Behavioral intention has a positive influence on the actual usage of mobile health services (Alam et al., 2020), electronic medical record system (Shiferaw & Mehari, 2019), mobile health apps (Saheb, 2020). TAM quantifies the influence of behavioral intentions on usage behavior in the adoption process and technology implementation. Behavioral intention measures the strength "of one's willingness to exert effort while performing certain behaviors" (Lee et al., 2003).

In this study, researcher pointed the adoption of personal health assistant service which can provide greatly impact to healthcare sector in Thailand, so it can be hypothesized that behavioral intention can have a greatly impact on usage behavior as reported by many researchers (Ahadzadeh et al., 2015; Barua & Barua, 2021; Gehrt & Yan, 2004; Taylor & Todd, 1995; Venkatesh et al., 2000). Based on the above assumptions, the following hypothesis is obtained:

H7: Behavioral intention has a significant influence on usage behavior of personal healthcare assistant service.

2.8 Usage Behavior

Usage behavior of technology can be referred to "one's actual action and frequency of a technology usage in some period of time" (Kim, 2008). In some study of ICT, usage behavior can be described as "the extent to which system are used daily, and to refer to the frequency of their usage in proportion to the amount of task performed with such system" (Igbaria et al., 1995). In this study, the usage behavior can also be defined as the successful usage of a personal health technology system which also involve a frequency of use. Venkatesh and Davis (2000) affirmed the strong linkage between behavioral intention and actual usage behavior.

3. Research Methods and Materials

3.1 Research Framework

Based on Figure 1, the previous studies determined the adoption of personal health assistant service per the research topic. Firstly, Lin and Chang (2011) studied self-service technology acceptance, employing TAM model; perceived usefulness (PU), perceived ease of use (PEOU), attitude toward use (AT) and behavioral intention (BI) which was used in this study. Secondly, the modification of TAM by Didyasarin et al. (2017) has accelerated an influencing impact between attitude toward use (AT) and customer satisfaction (CS). Thirdly, this study adopted UTAUT model from Moudud-Ul-Huq et al. (2021) in mobile health service adoption, applying facilitating condition (FC) and social influence (SI) and behavioral intention (BI) to explain the adoption of personal health assistant service in Bangkok, Thailand. Lastly, the research of Barua and Barua (2021) who examined online health service adoption during the COVID-19 pandemic has raised the importance of the significant variables between behavioral and usage behavior.
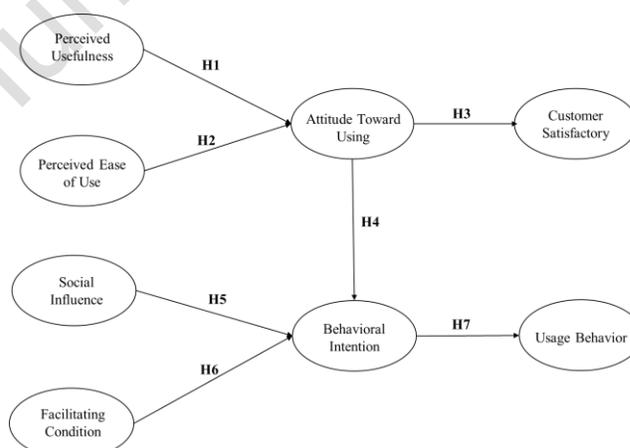

Figure 1: Conceptual Framework

H1: Perceived usefulness has a significant influence on attitude toward using personal healthcare assistant service.
H2: Perceived ease of use has a significant influence on attitude toward using personal healthcare assistant service.
H3: Attitude toward using has a significant influence on customer satisfaction on personal healthcare assistant service.
H4: Attitude toward using has a significant influence on behavioral intention of personal healthcare assistant service.
H5: Social influence has a significant influence on behavioral intention of personal healthcare assistant service.
H6: Facilitating condition has a significant influence on behavioral intention of personal healthcare assistant service.
H7: Behavioral intention has a significant influence on usage behavior of personal healthcare assistant service.

3.2 Research Methodology

500 participants involved in this study, applying purposive, stratified random, and convenience samplings. To assess content validity and reliability test, the index of item objective congruence (IOC) and Cronbach's Alpha coefficient value (pilot testing) of 50 samples were conducted. The survey consists of three parts, screening questions, measuring items Five-point Likert scale, and demographical profiles, including gender, nationality, age group, education, and occupation. The research applied statistical method, using confirmatory factor analysis (CFA) and structural equation modeling (SEM).

3.3 Validity and Reliability

Burns and Grove (1993) indicated that content validity is obtained from three sources: literature, representatives of the relevant populations, and experts. This study exercises content validity by the implementation of Index of Item–Objective Congruence (IOC) that allows professionals and experts to rate the research instruments in the questionnaire. All experts were requested to rate the score. Consequently, all 30 items are remained at the score 0.67 and above and not necessary to be revised.

Cronbach's alpha developed by Cronbach (1951) is one of the most accepted reliability measures in most literatures. In regard to reliability, alpha value is not accepted at less than 0.6 (Hair et al., 2003). The results of pilot test (n=50) are that all constructs are passed the rule of thumb for Cronbach's alpha, including Perceived Usefulness (0.726), Perceived Ease of Use (0.846), Attitude Toward Using (0.788), Customer Satisfaction (0.827), Social Influencing (0.837), Facilitating Condition (0.657), Behavior Intention (0.731), and Usage Behavior (0.835).

3.4 Population and Sample Size

The target population is potential hypertension patients of a private hospital in Bangkok Potential hypertension patients are those who have blood pressure of 120-139 and/or 80-89. Soper (2022) indicated in the online statistical software based on the prior sample size calculator that the minimum sample size should be 444 samples. Consequently, the researchers apply 500 samples for SEM analysis.

3.5 Sampling Technique

Probability sampling and non-probability sampling methods were used to conduct the sampling. Purposive sampling, stratified random sampling, and convenience sampling are applied. Purposive sampling is to select qualified participants who are potential hypertension patients

of Bumrungrad Hospital. Stratified random sampling is based on four groups of generations; 40-49 (Generation Y), 50-59 (Generation X), 60-69 (Baby Boomer), and 70 and Up (Senior Citizen), as shown in Table 1. For convenience sampling, the researcher distributes electronic survey to the qualified participants via MS Form, and paper survey to patients during their hospital visits.

Table 1: Stratified Random Sampling

Year-Old Range	Total number of Hypertension and Potential to have Hypertension Symptoms Patients	Potential Hypertension Symptoms	Sample Size of existing patients with potential Hypertension
Generation Y	7,473	2,641	247
Generation X	7,980	1,856	174
Baby Boomer	6,683	658	62
Senior Citizen	6,822	189	17
Total	**28,958**	**5,344**	**500**

Source: Constructed by Author (Based on the data from a private hospital in Bangkok).

4. Results and Discussion

4.1 Demographic Information

The demographic results from 500 participants show that males are 51.8 percent and females are 48.2 percent. Thai patients are 69.8 percent, and non-Thai patients are 30.2 percent. Most respondents are 40-49 years old at 49.4 percent, 50-59 years old at 34.8 percent, 60-69 years old at 12.4 percent, and 70 years old and up at 3.4 percent. Bachelor's degree takes the largest group of 62.6 percent. For occupation, most respondents are corporate employee at 31.8 percent, followed by entrepreneur/ business owners at 28.8 percent, and government officials at 18.2 percent.

Table 2: Demographic Profile

Demographic and General Data (n=500)		Frequency	Percentage
Gender	Male	259	51.8%
	Female	241	48.2%
Nationality	Thai	349	69.8%
	Non-Thai	151	30.2%
Age	40-49 Years Old	247	49.4%
	50-59 Years Old	174	34.8%
	60-69 Years Old	62	12.4%
	70 Years Old and Up	17	3.4%
Education	Below Bachelor's Degree	67	13.4%
	Bachelor's degree	313	62.6%
	Master's degree	85	17.0%
	Doctor's degree	35	7.0%
Occupation	Government Officer	91	18.2%
	Corporate Employee	159	31.8%
	Entrepreneur/	144	28.8%

Demographic and General Data (n=500)		Frequency	Percentage
	Business Owner		
	Workers	36	7.2%
	Househusbands/ Housewives	52	10.4%
	Retirement	12	2.4%
	Others	6	1.2%

4.2 Confirmatory Factor Analysis (CFA)

According to Table 3, CFA's results are determined by factor loadings equal to or above 0.50 and a p-value lower than 0.05. The acceptable coefficient value should be equal to or above 0.60, as Hair et al. (2003) recommended. Furthermore, the Composite Reliability (CR) is greater than the cut-off point of 0.6, and Average Variance Extracted (AVE) is higher than the cut-off point of 0.4 (Fornell & Larcker, 1981).

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

Variables	Source of Questionnaire (Measurement Indicator)	No. of Item	Cronbach's Alpha	Factors Loading	CR	AVE
Perceived Usefulness (PU)	(Nysveen et al., 2005)	3	0.882	0.820-0.884	0.882	0.714
Perceived Ease of Use (PEOU)	(Nysveen et al., 2005)	4	0.778	0.667-0.695	0.777	0.466
Attitude Toward Using (AT)	(Nysveen et al., 2005)	4	0.833	0.690-0.805	0.834	0.558
Customer Satisfaction (CS)	(Leppäniemi et al., 2017)	5	0.811	0.623-0.728	0.813	0.466
Social Influencing (SI)	(Moudud-Ul-Huq et al., 2021)	3	0.885	0.821-0.879	0.884	0.719
Facilitating Condition (FC)	(Moudud-Ul-Huq et al., 2021)	4	0.795	0.662-0.724	0.796	0.494
Behavior Intention (BI)	(Moudud-Ul-Huq et al., 2021)	3	0.760	0.667-0.798	0.762	0.517
Usage Behavior (UB)	(Venkatesh et al.,2012) and (Taylor & Todd, 1995)	4	0.844	0.696-0.813	0.844	0.576

SEM is discussed in examining the fit model (Fan & Sivo, 2007) with the development of "rules of thumb" to specify the fit degree in particular model. According to Table 4, the goodness of fit indices of the measurement model in the CFA is an acceptable fit, including CMIN/DF = 1.398, GFI = 0.936, AGFI = 0.921, NFI = 0.927, CFI = 0.978, TLI = 0.974, IFI = 0.978, and RMSEA = 0.028.

Table 4: Goodness of Fit for Measurement Model

Index	Acceptable Values	Statistical Values
CMIN/DF	< 3.00 (Hair et al., 2006)	527.118/377 = 1.398
GFI	≥ 0.85 (Kline, 2011)	0.936
AGFI	≥ 0.85 (Kline, 2011)	0.921
NFI	≥ 0.85 (Kline, 2011)	0.927
CFI	≥ 0.85 (Kline, 2011)	0.978
TLI	≥ 0.85 (Kline, 2011)	0.974
IFI	≥ 0.85 (Kline, 2011)	0.978
RMSEA	≤ 0.08 (Pedroso et al., 2016)	0.028
Model summary		**Acceptable Model Fit**

Remark: CMIN/DF = The ratio of the chi-square value to 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, IFI = Incremental Fit Index, and RMSEA = root mean square error of approximation
Source: Created by the author.

Hair et al. (2014) referred to discriminant validity as the extent to which the construct differs empirically and measures the degree of differences between the overlapping construct. In Table 5, the values show that discriminant validity is larger than all inter-construct/factor correlations. Consequently, the discriminant validity is approved.

Table 5: Discriminant Validity

	CS	PU	AT	BI	UB	PEOU	SI	FC
CS	0.683							
PU	0.591	0.845						
AT	0.270	0.288	0.747					
BI	0.232	0.317	0.072	0.719				
UB	0.599	0.454	0.356	0.187	0.759			
PEOU	0.596	0.669	0.424	0.222	0.538	0.683		
SI	0.550	0.701	0.349	0.303	0.439	0.646	0.848	
FC	0.568	0.539	0.160	0.263	0.477	0.519	0.575	0.703

Note: The diagonally listed value is the AVE square roots of the variables
Source: Created by the author.

4.3 Structural Equation Model (SEM)

The structural model presents "the development of the relationships between the latent variables" (Bollen, 1989). Based on Table 6, the results show the structural model fit in this study after adjustment with CMIN/DF = 2.295, GFI = 0.895, AGFI = 0.875, NFI = 0.875, CFI = 0.925, TLI = 0.917, IFI = 0.926, and RMSEA = 0.051.

Table 6: Goodness of Fit for Structural Model

Index	Acceptable Values	Statistical Values	
		Before Adjustment	After Adjustment
CMIN/DF	< 3.00 (Hair et al., 2006)	1698.754/398 = 4.268	897.427/391 = 2.295
GFI	≥ 0.85 (Kline, 2011)	0.781	0.895

Index	Acceptable Values	Statistical Values	
		Before Adjustment	After Adjustment
AGFI	≥ 0.85 (Kline, 2011)	0.744	0.875
NFI	≥ 0.85 (Kline, 2011)	0.764	0.875
CFI	≥ 0.85 (Kline, 2011)	0.808	0.925
TLI	≥ 0.85 (Kline, 2011)	0.790	0.917
IFI	≥ 0.85 (Kline, 2011)	0.809	0.926
RMSEA	≤ 0.08 (Pedroso et al., 2016)	0.081	0.051
Model summary		Unacceptable Model Fit	Acceptable Model Fit

Remark: CMIN/DF = The ratio of the chi-square value to 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, IFI = Incremental Fit Index, and RMSEA = root mean square error of approximation

Source: Created by the author.

4.4 Research Hypothesis Testing Result

The summary in Table 7 shows that the seven proposed hypotheses are proved by structural equation modeling (SEM), examined by the standardized path coefficient value (β), t-value, and p-value <0.05 is a measure of the significant effect.

Table 7: Hypothesis Results of the Structural Equation Modeling

Hypothesis	(β)	t-value	Result
H1: PU→ATT	0.047	0.639	Not Supported
H2: PEOU→ATT	0.422	5.123*	Supported
H3: ATT→CS	0.318	5.659*	Supported
H4: ATT→BI	-0.015	-0.256	Not Supported
H5: SI→BI	0.262	3.669*	Supported
H6: FC→BI	0.143	1.988*	Supported
H7: BI→UB	0.232	4.102*	Supported

Note: * p<0.05

According to Table 7, this study can be further discussed:
H1 disapproves of the significant influence of perceived usefulness and attitudes toward using personal healthcare assistant services, reflected in the standardized path coefficient value of 0.047 (t-value = 0.639). Similarly, previous empirical research found that perceived usefulness was not associated with attitude (Zhong et al., 2022).

H2 shows a standardized path coefficient value of 0.422 (t-value = 5.123), which supports the relationship between perceived ease of use and attitude toward using. Didyasarin et al. (2017) proposed that perceived ease of use is a powerful factor contributing to attitudes toward using healthcare mobile application services.

H3 supports that attitude toward use significantly influences customer satisfaction, revealing the standardized path coefficient value of 0.318 (t-value = 5.659). Lee (2009) indicated that the user's attitude positively impacted satisfaction towards behavioral intention in job bank websites in Taiwan.

H4 fails to support the significant impact of the attitude on behavioral intention, representing a standardized path coefficient value of -0.015 (t-value = -0.256). The results against that patient with positive attitudes about the technology will be driven by such intrinsic emotion to build behavioral intention to use it (Dabholkar & Bagozzi, 2002).

H5 points to the significant relationship between social influence and behavioral intention, resulting in a standardized path coefficient of 0.262 (t-value = 3.669). Hülür and Macdonald (2020) postulated that social influence is critical in the decision to use a medical service.

H6 validates the significant relationship between facilitating conditions and behavioral intention with a standardized path coefficient of 0.143 (t-value = 1.988). Venkatesh et al. (2003) discussed the significant impact between facilitating conditions and behavioral intention to use personal health assistant services in a private hospital in Thailand.

H7 authenticates that behavioral intention significantly influences personal healthcare assistant service usage with a standardized path coefficient of 0.232 (t-value = 4.102). Lee et al. (2003) affirm that behavioral intention measures the strength of one's willingness to exert effort while performing certain behaviors.

5. Conclusions and Recommendation

5.1 Conclusion and Discussion

The study examines 500 potential hypertension patients of a private hospital in Bangkok to determine factors of usage behavior of personal health assistant services. The major statistical tools are CFA and SEM to ensure validity, reliability, and hypotheses testing. The findings show that perceived ease of use significantly influences attitudes toward using. Attitude toward using has a significant influence on customer satisfaction but has no significant influence on behavioral intention. Social influence and facilitating conditions significantly influence behavioral intention. Furthermore, behavioral intention significantly influences usage behavior. Nevertheless, perceived usefulness has no significant influence on attitude toward use.

The causal relationship between perceived ease of use and attitudes toward using can be explicated. The technology acceptance model can explain the assessment of self-service technology adoption to measure the significant association between perceived ease of use and attitude toward use (Lin & Chang, 2011). It explains that patients would experience how easy personal health assistant services are and intrinsically build attitudes towards the use.

Attitude toward using has a significant influence on customer satisfaction but has no significant influence on behavioral intention. As aligned with Lin and Chang (2011), personal health assistant services and technology can build up patients' attitudes toward using a system and satisfaction. However, the results are opposite to the findings of Kleijnen et al. (2004) that a favorable attitude tends to express readiness and willingness to engage with technology.

Many studies reported that social influence and facilitating conditions significantly influence behavioral intention. Social influence is a key determinant of the UTAUT model and has been determined as a driver of intention to use and usage behavior of new technology. (Cho et al., 2015; Cialdini, 2003). Furthermore, this research emphasized that the impact of the close and remote relationship with the third party can dominate the behavioral intention to use personal health assistant services and technology provided by a service provider (Venkatesh et al., 2003).

Zhong et al. (2022) assumed that the benefits of using an online system are not the only motivation for users' attitudes due to learners' need to evaluate other factors. However, this study addressed the direct effect of perceived usefulness and attitude toward use, but it is not significant. Last, behavioral intention significantly predicts the actual usage of personal health assistant services, as supported by several studies (Alam et al., 2020; Saheb, 2020; Shiferaw & Mehari, 2019).

5.2 Recommendation

The leading enterprises in the healthcare industry should push more effort than even into redefining health technology by moving to the value-based care model for patients, considering significant factors enhancing usage behavior. The recommendation is to measure how personal health assistant services would serve the needs of potential hypertension patients. These groups of patients are aware of the risk of becoming hypertensive. Therefore, they expect a well-plan prevention and monitoring plan for their health.

Even though this study pointed out that usefulness and attitude are irrelevant, it showed a direct relationship between them. In order to secure the adoption of personal health assistant services, the service providers need to manage the information and efficiently communicate with potential hypertension patients. To encourage a successful

adoption, usability is a key determinant to arouse a positive attitude towards using personal health assistant services and technology. In the early step of the system development, developers should survey the users on how easy it is and whether they will demonstrate a positive attitude and behavioral intention to use it.

Attitude could enhance customer satisfaction. When patients interact with personal health assistant services, they intrinsically develop an attitude that leads to satisfaction. System developers and healthcare service providers could provide the trial use among the sample group before the full launch of the personal health assistant services. In this study, attitude shows a direct effect on behavioral intention. A favored or unfavored attitude could dictate behavioral intention. Therefore, customers' experience and their expectations from the use of personal health assistant services are required to be measured.

Furthermore, how the service providers provide consults and tools endorse social influence and facilitating conditions. The influence of the doctor or related medical staff can make patients more confident to accept personal health assistant services. In addition, behavioral intention can evolve to be the actual use of personal health assistant services. The successful adoption of such systems and tools should be closely monitored and tracked. In this process, system developers could investigate the willingness and successful use level to identify the improvement areas of personal health assistant services.

5.3 Limitation and Further Study

Future studies can be extended to another group of samples, such as in different areas and public hospitals, because customers' behavior can be different regarding purchasing power or cultural difference. Furthermore, this research only scopes to eight variables in the research model. The extension of variables in a model should be considered. Last, qualitative or mix-method should be methodized to pave the way of detail interpretation among the sample group.

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