



# Determinants of Customers' Intention to Use Healthcare Chatbots and Apps in Bangkok, Thailand

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## ABSTRACT

This study identifies the influence of performance expectancy, effort expectancy, social influence, facilitating conditions, and trust on intention to use healthcare chatbots and apps among users in Bangkok, Thailand. The online convenience sampling method collected data from 387 healthcare chatbots and apps users in Bangkok, Thailand. The results confirm these significant influencing factors on intention to use healthcare chatbots and apps. It reveals that facilitating conditions have the highest predictive power on intention to use healthcare chatbots and apps, followed by effort expectancy, trust, performance expectancy, and social influence, respectively. Moreover, this research could help better understand users' perceptions of using chatbots and apps. The healthcare marketers benefit from the result to improve their strategic planning in enhancing response to their customers' needs and expectations about healthcare products and services through chatbots and apps usage. It could improve strategies for using chatbots and apps to respond to customers' needs and expectations in any sector.

**Keywords:** *performance expectancy, effort expectancy, social influence, facilitating conditions, trust, intention to use healthcare chatbots and apps*

## 1. INTRODUCTION

### 1.1. Background of the Research

In recent years, the increasing number of smartphone subscribers has driven the usage of mobile application software for mobile devices, commonly referred to as mobile applications (Hsu & Lin, 2015). Since the development of smartphones, our everyday lives have relied mainly on their various functions (Cho, 2016). With the growing popularity of broadband networks and mobile devices, mobile devices have become an important channel for citizens to contact enterprises. The mobile service experience is more critical for customers to continue using entity services (Tam et al., 2018). In 2020, approximately 53.62 million people will have access to the internet in Thailand. The number of internet users has been gradually increasing since 2017. In terms of internet user behaviour in Thailand, Thai internet users spend around 10 hours daily using the internet (Statista Research Department, 2021). The Thai e-commerce industry demonstrated a tremendous increase in new customer acquisition at approximately 50% for 2020 (Srivorakul, 2021). The behaviour of digital people that needs every day is a

smartphone. To check information on social networks because the data is updated in real-time, all can know the quickly happening stories, no matter where you are. The digital age is an era where people talk less face to face and use texting and typing instead of technology. Chatbots are built to help people speak to humans via voice or text 24 hours a day, fast responding to users' needs in the digital age of chatbots. Therefore, it has been applied in various industries for business, such as being used for answering questions instead of call centres, for recommending products and services (Jintanon, 2017). Medical solutions through mobile health apps are an increasingly popular trend in 2022. Individual healthcare providers and organisations invest in healthcare app development to improve the quality of services and promote patient self-management behaviours. On the other hand, healthcare apps provide much-needed convenience. The patients are more than willing to use these apps (Georgiou, 2022). Furthermore, over 350,000 mobile Health apps are available, including medical and health, and fitness apps. Driven by increased smartphone adoption and ongoing heavy investment in the digital health market, Available apps have roughly doubled since 2015 (Franklin, 2021). Many studies support the unified theory of acceptance and use of technology (UTAUT) model in the digital era context (Venkatesh et al., 2003). Therefore, this study's theoretical framework was designed based on UTAUT. It was adopted to examine the determinants affecting customers' intention to use chatbots and applications in Bangkok, Thailand. Additionally, this study examines the willingness to use chatbots and applications in Bangkok, Thailand. Information from this study could develop a comprehensive tool for application makers in the future. This study will respond to customers' needs and expectations in setting appropriate goals in application management.

## **1.2. Problem Statement**

The rise of the internet and digitization have continually evolved. In this digital era, chatbots are critical technological tools equipped with artificial intelligence that allows businesses to interact with their customers. Customers can use this technology to search for information, make purchases, or request after-sales services via their computers or mobile devices (De Cosmo et al., 2021). The use of artificial intelligence (AI) is considered as crucial in industry 4.0 as several AI-powered technologies have been evolved with the potential to significantly improve people's quality of life in a variety of sectors, including healthcare sectors (Bajwa et al., 2021; Limna et al., 2021). Furthermore, countless people nowadays use mHealth apps to schedule appointments, review prescriptions and connect with doctors via video call online. Thus, it is critical to understand user satisfaction with mobile social and user applications (Hung et al., 2013; Talwar et al., 2016). Some studies confirm the influencing factors of intention to use chatbots and apps in a healthcare sector, such as the capability of the proposed system (Rosruen & Samanchuen, 2018), privacy concerns (Wang & Siau, 2018), and perceived enjoyment (Hauser-Ulrich et al., 2020). There is a relationship between factors of chatbots and customers' purchase intention in Thailand (Nuanchaona et al., 2021). Still, few studies support the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and trust on customers' intention to use chatbots and apps in healthcare products and services. It may benefit healthcare directors, healthcare administration, and healthcare providers to implement the appropriate strategies to increase an individual's intention to use chatbots and apps among Thai consumers in Bangkok.

## **1.3. Research Objective**

The study's objective aims to identify the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and trust on customers' intention to use chatbots and apps in the healthcare sector in Bangkok, Thailand.

#### **1.4. Research Question**

Is there the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and trust on customers' intention to use chatbots and apps in the healthcare sector in Bangkok, Thailand, and how?

## **2. LITERATURE REVIEW**

### **2.1. Customer's Intention to Use Chatbots and Applications in the Healthcare Sector**

Chatbots are natural language processing systems acting as virtual conversational agents mimicking human interactions as artificial intelligence (AI) devices. While the technology continues in its developmental phase, health chatbots could potentially increase access to healthcare, improve communication, or help manage the increasing demand for health services via remote testing, medication adherence monitoring, or teleconsultations. Chatbot technology enables specific health surveys, personal health-related reminders, communication with clinical teams, appointment booking, and retrieving and analysing health data (Nadarzynski et al. 2019). Additionally, translating diagnostic patterns into account behavioural indicators such as physical activity and sleep or nutrition. Such technology could potentially alter the delivery of healthcare systems, increasing uptake, equity, and cost-effectiveness of health services while narrowing the health and well-being of the main challenges and defining types and contexts related to chatbots in health. For example, chatbots can provide instant responses to health-related inquiries from patients while looking for specific patterns of symptoms in predicting disease, as presented by the internet-based delivery via mobile phone or a Messenger-based chatbot for outpatient and translational medicine (Huang & Chueh, 2020). Applications are potentially powerful platforms for delivering behaviour change interventions. They can improve engagement with established strategies for services, prevention, and treatment of disease through personalised goal setting and individualised dosing reminders. Applications linked to wearable devices that monitor heart rate and activity level often utilise additional behaviour change techniques such as social comparison, competition, and self-monitoring. Behaviour change has also benefited through improved adherence to treatment protocols (Rowland et al., 2020).

Human-computer interaction (HCI) is the context that is important in understanding how humans and machines interact (Tripathi, 2011). An automated conversation system or chatbot is a human-machine conversation approach that has been designed to fool humans into thinking they are conversing with a human rather than a machine. Chatbots have been widely used in a variety of fields, including customer service, website assistance, education, including healthcare (Almansor & Hussain, 2019; Yadav et al., 2019). Behavioural intention refers to the conscious plans of an individual or the likelihood that a person will perform a particular behaviour or not. Behaviour relates to whether a patient adopts the mobile health app (Nasir & Yurder, 2015; Zhao et al., 2018). Behavioural intention to adopt new technology is a dependent variable widely used in most research related to the acceptance of new technologies. Typically, this is a measurement variable designed to examine the intention to adopt new technology or continue using a technology quickly (Al-Adwan & Berger, 2015; Lu & Wang, 2016). In this study, customers use chatbots and applications to access healthcare products and services such as chatbots, fan pages, Facebook, and Line. Also, applications to access the pharmacies, hospitals, clinics, rescue, medicines, food supplements, mask shops, and other health-related matters. This study investigates the antecedents of customer intention to use chatbots and apps in the healthcare sector. Antecedents in this study are performance expectancy, effort expectancy, social influence, facilitating conditions and trust.

### **2.2. Performance Expectancy (PE)**

Performance expectancy was defined as how individuals believe that using the system will help them attain gains in a job (Shin, 2011). Performance expectancy refers to how the user expects that using the system will help them achieve job performance gains. The variables of performance expectancy include perceived usefulness that individuals believe utilising the system can improve performance or increase efficiency (Venkatesh et al., 2003). Extrinsic motivation can be understood as the perception that individuals perform an event to help achieve additional value with the event (Venkatesh et al., 2012). Doan (2020) confirmed that performance expectancy significantly influenced a customer's intention to purchase online in Vietnam. Online businesses should prioritise performance expectancy to improve online business performance (Doan, 2020). Catherine et al. (2017) also confirmed that an individual's behavioural intentions to use ATMs with fingerprint authentication in Ugandan banks were significantly influenced by performance expectancy. Therefore, there is a relationship between performance expectancy and customers' intention to use chatbots and apps for healthcare products and services.

*H1: Performance expectancy significantly influences customers' intention to use chatbots and healthcare product (service) applications.*

### **2.3. Effort Expectancy (EE)**

Effort expectancy was defined as the degree of ease associated with using the system (Venkatesh et al., 2003). The variables of effort expectancy include complexity and perceived ease of use. It is easier to measure the degree of success without much effort to recognise the ease of use of the innovation through sensing the system's ease of use. It is used to measure the level of complexity time spent learning innovation. Easy to use is used to measure the level of difficulty in understanding and duration of use (Venkatesh et al., 2012). Catherine et al. (2017) confirmed that effort expectancy significantly influenced an individual's behavioural intentions to use ATMs with fingerprint authentication in Ugandan Banks. Moreover, Do Nam Hung et al. (2019) confirmed that effort expectancy had a significant influence on the intention of Cambodian users to use mobile payment. Doan (2020) also confirmed that effort expectancy significantly influenced Vietnamese customers' intention to purchase online. Therefore, there is a relationship between effort expectancy and customers' intention to use chatbots and apps for healthcare products and services.

*H2: Effort expectancy significantly influences customers' intention to use chatbots and healthcare product (service) applications.*

### **2.4. Social Influence (SI)**

Social influence refers to how an individual perceives that it is essential that others believe they should use the new system. It directly determines the behavioural intention to use a technique or technology (Venkatesh et al., 2003). Social influence is the perception of individual expectations and beliefs in the use of information technology, such as the norms of the person around behaviour used to measure the appropriateness of the behaviour. It is used to measure the degree of influence of people around you that affect behaviour, such as family members or colleagues (Venkatesh et al., 2012). Catherine et al. (2017) confirmed that social influence significantly impacted an individual's behavioural intentions to use ATMs with fingerprint authentication in Ugandan banks. Doan (2020) also confirmed that social influence significantly impacted a Vietnamese customer's intention to purchase online. Therefore, there is a relationship between social influence and customers' intention to use chatbots and apps for healthcare products and services.

*H3: Social influence significantly influences customers' intention to use chatbots and healthcare product (service) applications.*

## 2.5. Facilitating Conditions (FC)

Facilitating conditions can be explained as the degree to which an individual believes that an organisation's technical infrastructure exists to support the system usage (Venkatesh et al., 2003). Facilitating conditions have an impact on the user acceptance of technology. The provision of the necessary facilitation conditions such as proper ICT infrastructure, low cost of Internet bundles, and reduced cost of connecting devices to applications (Mensah, 2019). Catherine et al. (2017) confirmed that facilitating conditions influence an individual's behavioural intentions to use ATMs with fingerprint authentication in Ugandan banks. Moreover, Do Nam Hung et al. (2019) confirmed that facilitating conditions influenced Cambodian users' intention to use mobile payment significantly. Doan (2020) also confirmed that facilitating conditions impacted a customer's intention to purchase online in Vietnam. Therefore, there is a relationship between facilitating conditions and customers' intention to use chatbots and apps for healthcare products and services.

*H4: Facilitating conditions significantly impact customers' intention to use chatbots and healthcare product (service) applications.*

## 2.6. Trust (TR)

Trust was defined as an individual's willingness to accept vulnerability based on positive expectations about the intentions or behaviour of another in a context characterised by risk and interdependence. Trust is a feature of most economic and social interactions in which uncertainty is present (Masri & Tarhini, 2017). Practically all interactions necessitate an element of trust, especially those in the uncertain environment of the internet. Therefore, trust is an individual's intentions or behaviour based on positive expectations regarding risk and independence in healthcare chatbots and apps for products and services (Paul & Pavlou, 2003). Lu et al. (2011) investigated the dynamics of the trust transfer process and the intention to use mobile payment services. Customers' intentions to use mobile payment services were influenced directly and indirectly by their initial trust in mobile payment services. Lin and Lu (2010) also confirmed that trust had a significantly positive influence on consumer purchase intention. Therefore, there is a relationship between trust and customers' intention to use chatbots and apps for healthcare products and services.

*H5: Trust significantly influences customers' intention to use chatbots and healthcare product (service) applications.*

## 2.7. Conceptual Framework

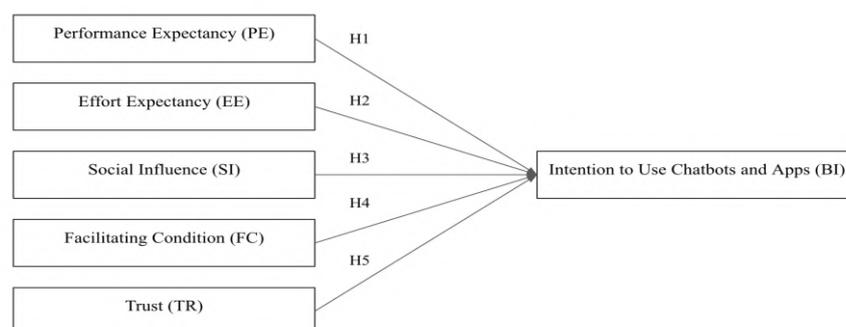


Figure 1. Conceptual Framework

### 3. RESEARCH METHODOLOGY

#### 3.1. Research Method

The researchers employed closed-end questionnaires (Likert's Rating Scale) in data collection. The researchers developed the questionnaire items based on previous research that had been reliable and valid. The questionnaire was tested on 30 respondents (pre-testing) for a dedicated questionnaire. The Cronbach Alpha values are needed to overcome all constructs 0.70 (Chana et al., 2021). The main variables in this study were all measured using a five-point Likert Scale. The classification scale was strongly agreed with a rating of 5, agreed with a rating of 4, neutral with a rating of 3, disagreed with a value of 2, and strongly disagreed with a rating of 1. The demographics of the respondents were derived from the study conducted by Kaewnaknaew et al. (2022), Jandawapee et al. (2022) and Si Dah (2022). The questionnaire items in the constructs of performance expectancy, effort expectancy, social influence, facilitating conditions and trust on intention to use healthcare chatbots and apps were based on Venkatesh et al. (2003). The questionnaire items in the trust construct were based on Lee et al. (2021). The questionnaire items in the intention to use healthcare chatbots and apps construct were based on Chao (2019).

#### 3.2. Population and Sample

The population was the healthcare chatbots and apps users in Bangkok, Thailand. The sample was healthcare chatbots, and apps users in Bangkok, Thailand, and all were Thai who were over 18 years old. According to many studies, the study's sample size should be above 385 (Kanyama et al., 2022; Limna et al., 2022). Therefore, the study's sample was 387, over a minimal sample size of 385 through convenience sampling.

#### 3.3. Data Collection

The population was the chatbots and apps users for the healthcare products and services in Bangkok, Thailand. The sample was over 18 years old, and all were Thai who lived in 50 regions in Bangkok, Thailand. Data were collected between January 2<sup>nd</sup> and February 15<sup>th</sup>, 2022, via the self-administered online survey.

#### 3.4. Data Analysis

The collected data were analysed using the SPSS program Version 27 and the Partial Least Squares Structural Equation Model: PLS-SEM, ADANCO 2.3. Descriptive statistics (frequency and percentage) were employed to identify the demographic characteristics of the respondents. The results of each variable and the questionnaire items were analysed using the mean, standard deviation, and factor loadings. The reliability coefficient of Jöreskog's Rho was used to determine the measurements' reliability was set at 0.7. The factor loadings of the instrument were calculated for its validity was set at 0.7. The average variance extracted (AVE) values were set at above 0.5 (Sharma et al., 2019). Finally, the hypotheses were tested using PLS-SEM, ADANCO 2.3 (inferential statistic).

## 4. RESULTS

Table 1. Demographic Characteristics of the Respondents (n=387).

Demographics	Frequency	Percentage
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<b>Gender</b>	Male	117	30.2%
	Female	270	69.8%
<b>Age</b>	18-30 years old	185	47.8%
	31-40 years old	154	39.8%
	41-50 years old	37	9.6%
	51 years old or over	11	2.8%
<b>Status</b>	Single	297	76.8%
	Married	64	16.5%
	In Relationship	26	6.7%
<b>Education</b>	Associated Degree	5	1.3%
	Bachelor's Degree	249	64.3%
	Master's Degree or Higher	133	34.4%
<b>Occupation</b>	Student	41	10.6%
	Civil Servant	71	18.4%
	Private Company Employee	158	40.6%
	Personal Business	67	17.3%
	Freelance	50	13.1%
<b>Monthly Income</b>	Less than 20,000 THB	23	5.9%
	20,001 - 40,000 THB	218	56.4%
	40,001 - 60,000 THB	83	21.4%
	60,001 - 80,000 THB	36	9.3%
	80,0001 - 100,000 THB	14	3.6%
	More than 100,000 THB	13	3.4%
<b>Total</b>		<b>387</b>	<b>100%</b>

The researchers coded and analysed the completed three hundred and eighty-seven (387) online questionnaires of healthcare chatbots and apps users in Bangkok, Thailand. The results revealed that most respondents were female (69.8%), aged between 18 to 30 (47.8%), single (76.8%), had a bachelor's degree (64.3%), earned a monthly income between 20,001 - 40,000 baht (56.4%) and worked as the private company employees (40.6%). The demographic profile was represented as the study's sample.

#### 4.1. PLS-SEM Results

Table 2. Item Loadings, Jöreskog's Rho and Average Variance Extracted (AVE) (n=387).

Items	Factor Loadings	Jöreskog's Rho	AVE
<b>Performance Expectancy</b>		0.8016	0.5026
PE1. Chatbots and applications are useful in my health care system and life. (Mean=4.49, SD.=0.54)	0.7166		
PE2. Using chatbots and applications can respond to my need for healthcare products and services. (Mean=4.40, SD.=0.56)	0.7230		

PE3. Using chatbots and applications helps me manage my diary healthcare more quickly. (Mean=4.34, SD.=0.52)	0.7155		
PE4. Using chatbots and applications increases my capability to manage my health. (Mean=4.23, SD.=0.58)	0.6798		
<b>Effort Expectancy</b>		0.8016	0.5744
EE1.It is easy for me to learn how to use chatbots and apps to meet my healthcare product and service needs. (Mean=4.08, SD.=0.64)	0.7078		
EE2.Chatbots and applications can interact with me clearly for healthcare products and services. (Mean=4.11, SD.=0.66)	0.7900		
EE3. Chatbots and applications for healthcare products and services are easy to use. (Mean=4.21, SD.=0.65)	0.7734		
<b>Social Influence</b>		0.8691	0.6888
SI1. People who are important to me think that I should use chatbots and applications for healthcare products and services. (Mean=4.31, SD.=0.59)	0.8101		
SI2. People who influence my behaviour think that I should use chatbots and applications for healthcare products and services. (Mean=4.41, SD.=0.62)	0.8233		
SI3. People who I value think that I should use chatbots and applications for healthcare products and services. (Mean=4.41, SD.=0.65)	0.8558		
<b>Facilitating Conditions</b>		0.7821	0.6426
FC1. Chatbots and applications for healthcare products and services are compatible with the technologies I use. (Mean=4.07, SD.=0.62)	0.7622		
FC2. I can get help from others when I have difficulties using chatbots and applications for healthcare products and services. (Mean=3.94, SD.=0.71)	0.8392		
<b>Trust</b>		0.8533	0.6599
TR1. I can trust chatbots and apps while chatting about healthcare products and services. (Mean=3.73, SD.=0.74)	0.8290		
TR2 Chatbots and applications provide safe and reliable healthcare products and services information. (Mean=3.78, SD.=0.74)	0.8282		
TR3. I trust chatbots and applications for healthcare products and service commitment to respond to my information needs. (Mean=3.72, SD.=0.82)	0.7790		
<b>Intention to Use Chatbots and Apps</b>		0.85367	0.6609
BI1. I will consider using chatbots and applications if I need healthcare products or services. (Mean=3.96, SD.=0.60)	0.7613		
BI2. Chatbots and applications are the first choices if I need urgent medical health services. (Mean=3.99, SD.=0.68)	0.8571		
BI3. I will continue to use chatbots and applications if I need healthcare products or services. (Mean=4.13, SD.=0.60)	0.8176		

Table 3. Overall Model (n=387).

Goodness of Model Fit	Value
Saturated Model	0.0772
Estimated Model	0.0772

Table 4. R-Squared (n=387).

Construct	Coefficient of Determination (R <sup>2</sup> )	Adjusted R <sup>2</sup>
Intention to Use Chatbots and Apps	0.3277	0.3189

Table 5. Effect Overview (n=387).

Effect	Beta	Total Effect	Cohen's f <sup>2</sup>
Performance Expectancy → Intention to Use Chatbots and Apps	0.129	0.129	0.0149
Effort Expectancy → Intention to Use Chatbots and Apps	0.170	0.170	0.0280
Social Influence → Intention to Use Chatbots and Apps	0.101	0.101	0.0098
Facilitating Conditions → Intention to Use Chatbots and Apps	0.238	0.238	0.0627
Trust → Intention to Use Chatbots and Apps	0.151	0.151	0.0223

Table 6. Total Effects Inference (n=387).

Effect	Original Coefficient	Standard Bootstrap Results				Percentile Bootstrap Quantiles			
		Mean Value	Standard Error	T-Value	P-Value (2-Sided)	P-Value (1-Sided)	0.5%	2.5%	97.5%
PE → BI	0.129	0.1299	0.0610	2.1109	0.0350	0.0175	-0.0178	0.0111	0.2547
EE → BI	0.170	0.1719	0.0506	3.3533	0.0008	0.0004	0.0381	0.0752	0.2729
SI → BI	0.101	0.1006	0.0550	1.8319	0.0673	0.0336	-0.0454	-0.0098	0.2040
FC → BI	0.238	0.2388	0.0485	4.9071	0.0000	0.0000	0.1118	0.1356	0.3277
TR → BI	0.151	0.1491	0.0487	3.0952	0.0020	0.0010	0.0152	0.0608	0.2438

PE = Performance Expectancy, EE = Effort Expectancy, SI = Social Influence, FC = Facilitating Conditions, TR = Trust, BI = Intention to Use Chatbots and Apps

Performance expectancy can predict customers' intention to use healthcare chatbots and apps at  $\beta=0.129$ ,  $p<0.05$  (Two tails at 0.0350 and one tail at 0.0175). Effort expectancy can predict customers' intention to use healthcare chatbots and apps at  $\beta=0.170$ ,  $p<0.001$  (Two tails at 0.0008 and one side at 0.0004). Social influence can predict customers' intention to use healthcare chatbots and apps at  $\beta=0.101$ ,  $p<0.05$  (Two tails at 0.0673 and one side at 0.0336). Facilitating conditions can predict customers' intention to use healthcare chatbots and apps at  $\beta=0.238$ ,  $p<0.001$  (Two tails at 0.000 and one side at 0.000). Trust can predict customers' intention to use healthcare chatbots and apps at  $\beta=0.151$ ,  $p<0.001$  (Two tails at 0.0020 and one

side at 0.0010). Overall, the relationship phenomenon predicting customers’ intention to use healthcare chatbots and apps can be explained by 32.8% ( $R^2=0.328$ ).

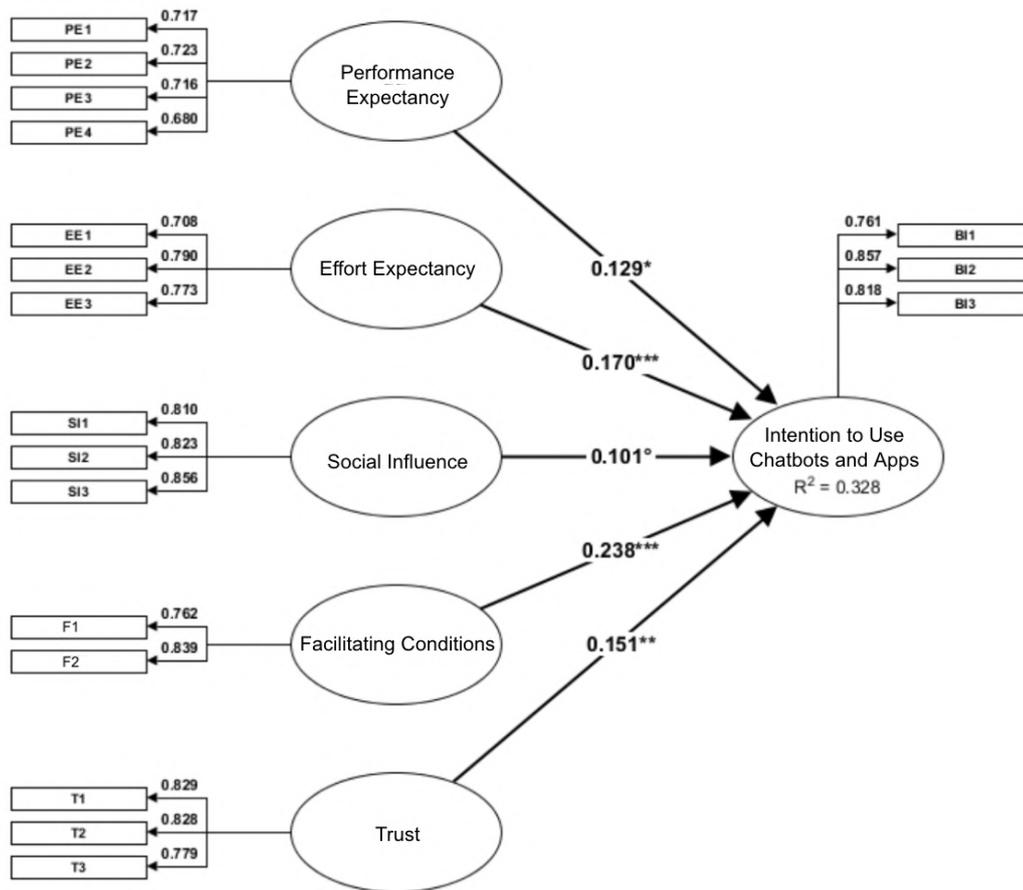


Figure 2. PLS-Structural Equation Model of the Study.

## 4.2. Assumptions

Table 7. Summary of Hypothesis Testing.

Hypotheses	Results	Actions
H1: Performance Expectancy → Intention to Use Chatbots and Apps	$\beta=0.129$ at $p<0.05$	Accepted
H2: Effort Expectancy → Intention to Use Chatbots and Apps	$\beta=0.170$ at $p<0.001$	Accepted
H3: Social Influence → Intention to Use Chatbots and Apps	$\beta=0.101$ at $p<0.05$	Accepted
H4: Facilitating Conditions → Intention to Use Chatbots and Apps	$\beta=0.238$ at $p<0.001$	Accepted

H5: Trust → Intention to Use  
Chatbots and Apps

$\beta=0.151$   
at  $p<0.001$

Accepted

Overall, the relationship phenomenon predicting customers' intention to use healthcare chatbots and apps can be explained by 32.77% ( $R^2=0.3277$ ).

## 5. DISCUSSION AND CONCLUSION

### 5.1. Discussion

The study's PLS-SEM model confirmed the proposed conceptual framework. The findings indicated performance expectancy, effort expectancy, social influence, facilitating conditions, and trust significantly influence an individual's intention to use healthcare chatbots and apps. The results supported the previous research of Catherine et al. (2017), Doan (2020), and Venkatesh et al. (2003) that there is a relationship between performance expectancy and customers' intention. Thus, performance expectancy significantly influences customers' intention to use chatbots and healthcare product (service) applications. The results supported the previous research of Catherine et al. (2017), Doan (2020), and Do Nam Hung et al. (2019) that there is a relationship between effort expectancy and customers' intention. Therefore, effort expectancy significantly influences customers' intention to use chatbots and healthcare product (service) applications. The results supported the previous research of Catherine et al. (2017), Doan (2020), and Venkatesh et al. (2003) that there is a relationship between social influence and customers' intention. Thus, social influence significantly influences customers' intention to use chatbots and healthcare product (service) applications. The results supported the previous research of Catherine et al. (2017), Doan (2020), and Do Nam Hung et al. (2019) that there is a relationship between facilitating conditions and customers' intention. Thus, facilitating conditions influences customers' intention to use chatbots and healthcare product (service) applications. The results supported the previous research of Lin & Lu (2010) and Lu et al. (2011) that there is a relationship between trust and customers' intention. Therefore, trust significantly influences customers' intention to use chatbots and healthcare product (service) applications.

### 5.2. Conclusions

The results confirm the significant antecedents of intention to use healthcare chatbots and apps, including performance expectancy, effort expectancy, social influence, facilitating conditions, and trust. Furthermore, it reveals that facilitating conditions have the highest predictive power on intention to use healthcare chatbots and apps, followed by effort expectancy, trust, performance expectancy, and social influence, respectively. As a result, to increase customers' intention to use chatbots and healthcare product (service) applications. Healthcare marketers should consider facilitating conditions by providing customer service to help users when needed and ensuring chatbots and applications for healthcare products and services are compatible with the technologies that most customers use. Improve effort expectancy by developing healthcare chatbots and apps that are easy for users to use and increasing trust by providing safe and reliable healthcare product and service information on healthcare chatbots and apps. Healthcare strategic planners should consider performance expectancy by, for example, increasing users' perceptions of how healthcare chatbots and apps improve their health. Furthermore, family, friends, and social media influencers may help establish social influence that increases intentions to use healthcare chatbots and apps. Finally, healthcare

marketers should consider providing customer service to assist users when needed and develop healthcare chatbots and apps to respond to customers for a competitive advantage.

### 5.3. Research Implication

The results may assist healthcare marketers in improving their strategic planning in responding to their customers' needs and expectations about healthcare products and services with chatbots and applications. Furthermore, this study may aid chatbot and app companies in better understanding how users perceive chatbots and apps and increase customers' intention to use chatbots and apps in any industry. As a result, high business performance will incur. Furthermore, this study added to the existing literature on the relationship between performance expectancy, effort expectancy, social influence, facilitating conditions, trust, and intention to use healthcare chatbots and apps. This study's findings may aid academics in broadening their research by incorporating more potential elements. The measurements could be used to guide future research on performance expectancy, effort expectancy, social influence, facilitating conditions, trust, and indicators of an intention to use healthcare chatbots and apps.

### 5.4. Limitations and Recommendations

This study identifies the influence of performance expectancy, effort expectancy, social influence, facilitating conditions, and trust on intention to use healthcare chatbots and apps among users in Bangkok, Thailand. It only looked at samples from Bangkok and may not include other predictors. The recommendation is to expand more areas further. Moreover, further quantitative research is recommended to consider more variables. Also, a qualitative design, such as interviews and focus groups, could give more insight into results.

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