SELF-ACCEPTANCE OF THE PROTOTYPE OF THE WATER SUPPLY UNIT REGISTRATION APPLICATION FOR CONSUMERS

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Abstract

The objectives of this research were 1. To study the problems and needs of self-reading water supply units for consumers, 2. To develop an innovative prototype application for self-reading water supply units for consumers and 3. To study the factors affecting the acceptance of an innovative prototype application for self-reading of water supply units for consumers. This research methodology was quantitative. Data was collected from 418 users of the Provincial Waterworks Authority at Om Noi branch by systematic sampling method. The tool used was a questionnaire. Data analyzed with descriptive statistics such as frequency, percentage, mean, and standard deviation with a statistical significance of .05 in hypothesis testing.

The results from hypothesis testing using multiple linear regression analysis revealed that system quality, ease of use, and system performance affected the acceptance of an innovative prototype application for self-reading of water supply units for consumers at 65.8. % testing the independent variables not affect the variable was system quality (Sig. = .066) the factors of ease of use (Sig. = .006) and efficiency (Sig. = .000) which were less than .05 revealed that ease of use and efficiency had a positive influence. However, system quality did not significantly influence application acceptance for the Provincial Waterworks Authority. The results of the acceptance of an innovative prototype application for self-reading of water supply units for consumers can be considered practical according to the purpose of serving water users of the Provincial Waterworks Authority.

The research results were as follows: 1) an innovative application prototype for managing foreign workers of ABC Company requires use of a variety of languages including Thai, English and Myanmar. Functions have been added to support the comprehensive service of foreign workers, and information about foreign workers in public health that is useful to the government and foreign workers. 2) The study of factors affecting the acceptance of the innovation model for managing foreign workers of ABC Company found that the aspect that had the greatest effect was the safety risk perception factor, followed by the condition of the facilities in use, perceived ease of use, attitude toward using technology, social influence and the perception of benefits from use. These were statistically significant at the .05 level.

Keywords: Innovative prototype, Application, Migrant workers

Introduction

Currently, the Provincial Waterworks Authority (PWA) Aom Noi Branch has hired representatives to read water meters using meter reading devices, record water usage data, calculate, and print water bills with portable printers (Mobile Printers). They deliver the water bills and meter reading data to the branch office on the specified dates and times every month. As the PWA develops a new information system for customer service to align with business operations, called the Customer Information System (CIS), contractors must be ready to modify and update the program for receiving and sending text files and other tasks related to the billing system and the CIS to meet the PWA's requirements.

Issues that often arise from hiring representatives to read meters include the inability to promptly update and modify programs for receiving and sending text files and other tasks related to the billing system and the CIS according to the Provincial Waterworks Authority's requirements. Water bills distributed to customers may get

lost, and problems with the water bill's barcode, such as faded printing or incorrect format, can prevent customers from being able to use the bill to make payments at various counters.

Currently, technology has advanced significantly, leading to the widespread use of mobile phones, commonly known as smartphones. These devices retain the basic functions of earlier mobile phones, such as making calls, receiving calls, and sending and receiving messages through the telephone network. However, technological advancements have endowed mobile phones with enhanced capabilities, enabling them to access the internet via 3G, 4G, and 5G networks, as well as WiFi. This allows mobile phones to browse websites similar to how computers do, thus earning the term "smartphone."

Modern smartphones have been continuously developed to support a wide range of applications, including various social media platforms like Facebook, Messenger, Line, Instagram, and Twitter. Additionally, numerous applications have been developed to cater to daily life needs, further enhancing the utility of smartphones.

In this case, researcher interested to study Self-acceptance of the prototype of the water supply unit registration application for consumers: a case study of water users of the Provincial Waterworks Authority (PWA) Aom Noi Branch. The researcher aims to integrate the water user data from the PWA Aom Noi Branch to facilitate the transmission of actual water meter readings by users. This approach is intended to streamline the water billing process for the PWA and enhance convenience and speed for consumers, ultimately benefiting the PWA Aom Noi Branch.

The results of this study will serve as a guideline for researching the prototype of an innovative application for consumers to self-record their water usage: a case study of water users of the Provincial Waterworks Authority (PWA) Aom Noi Branch. This information can be used to further develop the self-recording water meter application, enhancing its efficiency. It will benefit researchers and interested individuals by providing a foundational resource for further studies on related topics.

The Research Objective

1. To study the problems and needs of self-reading water supply units for consumers,
2. To develop an innovative prototype application for self-reading water supply units for consumers
3. To study the factors affecting the acceptance of an innovative prototype application for self-reading of water supply units for consumers.

Literature Reviews

1. Concept of Mobile Applications (Mobile Application)

The term "Mobile Application" consists of two words: Mobile and Application. Their meanings are as follows: Mobile refers to portable communication devices that, in addition to basic phone functionalities, also perform like computers. Being portable devices, they have notable features such as small size, light weight, and relatively low energy consumption. Nowadays, they are often used for multiple purposes, including exchanging information with computers. Application refers to software used to assist the user (User) in performing tasks. An application must have what is called a User Interface (UI), which serves as the intermediary for various operations. (Admission Premium Team, 2017)

2. Concepts and Theories on Information System Quality

Information System Quality refers to the quality of an information system being suitable for use and meeting user requirements. Therefore, the quality of an information system can be assessed by its utility, ease of use, accessibility, stability, and response time. The quality of an information system positively influences its usage. Studies have shown that system quality positively impacts user satisfaction, such as Petter & Fruhling (2011), who found that the quality of the STAT Pack emergency medical information system positively

influenced the intention to use it. Dong, Cheng & Wu (2014) studied social networking services in the digital content industry, specifically Facebook in Taiwan, and found that system quality positively affected user satisfaction. Chen, Chen & Capistrano (2013) compared the success of e-commerce websites in two countries, finding that system quality positively impacted user satisfaction through accurate and up-to-date information accessible efficiently. Tam & Oliveira (2016) discussed Information System Quality by DeLone & McLean (2003), which includes: 1. System Quality: Completeness, Ease of Understanding, Personalization, Relevance, and Security. 2. Information Quality: Adaptability, Availability, Reliability, Response Time, and Usability. 3. Service Quality**: Tangibles, Assurance, Empathy, and Responsiveness. 4. User Satisfaction: Repeat Visits and overall satisfaction through user surveys. The system helps users create value for both internal and external customers, leading to overall satisfaction.

3. Concepts and Theories on Perceived Ease of Use

Perceived Ease of Use refers to the degree of confidence users have in an information system being developed and targeted for use, being easy to learn and use without much effort (Davis, 1989). Perceived ease of use has a direct influence on system usage and an indirect influence by affecting perceived usefulness (Patrawadee Thongmala, 2015). Gefen & Straub (2000) noted that ease of use is a factor that makes technology more useful and attracts new users because it is easy to use, making technology more valuable in the eyes of users. Saade & Bahli (2005) explained that perceived ease of use indicates the level of confidence individuals have in using a technology without effort, leading to a higher likelihood of adopting new technologies. Vanida Tanurak, Narapon Jinandedet, and Prayong Mejaisee (2017) defined perceived ease of use as the belief that newly developed information systems are easy to learn and use without requiring extensive experience. Pasakorn Phongnetpanich and Krisana Wisamitananda (2016) stated that perceived ease of use involves non-monetary but tangible psychological costs that consumers bear when spending effort and time using a service. This non-monetary sacrifice positively influences the acceptance of information technology for entertainment purposes, impacting internet usage for entertainment and predicting the intention to use such technology. Based on these concepts and theories, Perceived Ease of Use can be defined as the expectation that chosen technology will be easy to use without needing extensive study, effort, or advanced experience. This ease of use can increase the likelihood of technology adoption.

4. Concepts of Usability Efficiency

Facilitating conditions refer to the extent to which individuals believe that technical infrastructure exists to support the use of technology. This reflects the perception of external constraints related to behavior, resources, and technological support in the work environment. Venkatesh et al. (2003) noted that assistance and guidance availability facilitate users in overcoming technological issues. However, facilitating conditions may include a technological environment designed to eliminate barriers to technology use, making it easier for consumers to use mobile shopping functions and features. Mobile device facilitating conditions (e.g., connectivity, speed, and enhanced processing capabilities) and individuals' knowledge about using mobile shopping features help consumers access mobile shopping services. Facilitating conditions are motivating factors that affect consumers' ease of using technology to purchase products and services. High facilitating conditions will extend the lifespan of using mobile shopping services (Yang & Forney, 2013). This aligns with Mazman & Usluel (2010), who stated that "target factors found in the environment observed by individuals make actions easier and provide support when necessary or in case of problems, controlling the environment easily according to their ideas." These facilitating factors, such as assistance from others, help menus, or support services in content and process management, are crucial for technology acceptance. Similarly, Natthaya Srisuksawang (2015) mentioned that facilitating conditions are resources that individuals believe will support their activities or actions, and continuous usage behavior is difficult if there are insufficient facilitating conditions. Patnasingam, Gefen & Pavlou (2005) identified four facilitating conditions: 1) Connectivity with technology, 2) Standards, 3) Security, and 4) Product

descriptions. Neuendorf & Valdiseri (2016, cited in Phonchanok Plaboon, 2015) reported that facilitating conditions for usability refer to individuals' belief that the organization's infrastructure will promote or facilitate usage. Related factors include: 1) Perceived Behavioral Control: Used to measure the readiness of resources being utilized, knowledge, and capabilities. Hierarchical or Higher-order Models describe the perception of controlling one's behavior in performing any action, based on user confidence in measuring personal capabilities and control ability. 2) MPCU (Model of PC Utilization): Used to measure the resources' readiness. 3) Compatibility with Users (DOI) : Used to measure compatibility and fit. From the above concepts and theories, Facilitating Conditions are elements that ease usability, reducing the gap between consumers and technology, and making technology more accessible to consumers.

5. Concepts and theories of technology acceptance (Technology Acceptance Model: TAM)

Technology Acceptance Model (TAM) is a theory that discusses the factors that make users accept and choose technology, expressed in a model that shows when new technology is introduced and what factors are included. That has a positive influence on users' decisions. This theory has two main factors: Perceived Usefulness and Perceived Ease of Use (Davis, 1989) and some theories support it. Technology Acceptance Theory (Technology Acceptance Model: TAM) includes:

1. Theory of Reasoned Action (TRA) is a theory about factors that can drive purchases with the aim of predicting users' purchase intention behavior
2. Theory of Planned Behavior (TPB) is a theory about beliefs and behavior It was developed from the Theory of Reasoned Action (TRA).

6. Related Research

Natthapass Daraaphong (2017) conducted a study titled "Factors Affecting the Acceptance of Mobile Banking Technology." The objectives were to examine factors influencing the acceptance of Mobile Banking technology and to compare the acceptance behavior of different age and education groups using the Technology Acceptance Model (TAM) as the research framework. Additional factors from literature reviews were incorporated into the study. There were nine variables considered: Perceived Usefulness, Perceived Ease of Use, Subjective Norms, Descriptive Norms, Injunctive Norms, and Attitudes towards Behavior, Perceived Trust, Behavioral Intention, and Actual System Usage. Data were collected using questionnaires distributed among 473 respondents in Bangkok, aged 21-72, including Generation Y (21-38), Generation X (39-53), and Baby Boomers (54-72), with education levels ranging from high school or lower, bachelor's degrees, and higher. The findings indicated that respondents aged 54-72 and those with high school or postgraduate education desired ease of use in the application. Respondents aged 21-53 and those with a bachelor's degree desired usefulness. Additionally, close family and friends influenced the Mobile Banking usage of respondents aged 21-53 and those with a bachelor's degree, while social contacts influenced older respondents and those with a high school education. High school graduates also required high trust in the application.

Pathomphon Rodsiri (2021) studied "Information System Quality, Perceived Ease of Use, Perceived Usefulness, and Satisfaction Affecting the Intention to Use the e-Filing System." The objectives were to examine the quality of the information system, perceived ease of use, perceived usefulness, and satisfaction affecting the intention to use the e-filing system. The study involved personal factors, information system quality, perceived ease of use perceived usefulness, and satisfaction. The sample included 400 e-filing system users, and data were collected using questionnaires. Statistical analysis involved frequency distribution, percentage, mean, standard deviation, t-test, one-way ANOVA, and multiple regression analysis. Results indicated that most users were female, aged 21-40, working in the judiciary, with a bachelor's degree. The overall information system quality was high, with the highest mean in system benefits. Perceived ease of use, perceived usefulness, and satisfaction were also rated high, and the overall intention to use the e-filing system was high. Hypothesis testing showed significant differences in the intention to use the e-filing system based on different user statuses.

Jirandorn Buhuachai (2017) conducted a study titled "Guidelines for Developing a Prototype Chatbot for Providing Advice on Research Grant Application Systems at Nakhon Pathom Rajabhat University." The research found that when experts tested the chatbot prototype on Android and iOS operating systems, it performed well. Based on the feedback from these experts, the researcher is confident that implementing the developed chatbot prototype in practice will significantly enhance organizational efficiency.

Nawaphat Suphasinwat (2017) conducted a study on "Developing a Chatbot System for E-commerce in Online Messaging." The findings indicated that the system met its objectives, with user satisfaction ratings as follows: meeting user needs (3.75/5), ease of use (4.50/5), and accuracy and efficiency (4.78/5). This suggests that user satisfaction is high, and the system is effective enough for practical use.

Patchara Deecharoen (2020) conducted a study titled "Factors Affecting the Acceptance of the DLT GPS Application in Public Buses of Mongkolchai Transport Co., Ltd." The objectives were to compare the acceptance of the DLT GPS application based on demographic characteristics and to study the technology acceptance factors affecting the application. A quantitative research method was used with a sample of 400 public bus users in Samut Sakhon province. The data collection tool was a questionnaire. Descriptive statistics included frequency, percentage, mean, and standard deviation, while inferential statistics included variance analysis and multiple regression analysis. The research found that all aspects of technology acceptance factors were rated highly. Hypothesis testing revealed that users with different monthly incomes and occupations had significantly different acceptance levels of the DLT GPS application significant at the 0.05 level. Other demographic characteristics showed no significant differences. The overall technology acceptance factors could predict 50.04% of the acceptance of the DLT GPS application. Independent variables such as usage behavior, perceived ease of use, and attitudes towards usage significantly influenced the acceptance of the DLT GPS application at the 0.05 level.

Hansen, Saridakis & Benson (2018) conducted research on "Risk, Trust, and Their Relationship with Perceived Ease of Use and Behavioral Control in Predicting Consumer Use of Social Media." The study integrated the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB). The findings indicated that perceived ease of use (from TAM) significantly affected perceived behavioral control (from TPB). The intention to use social media for transactions in the short term benefits from combining concepts from both models rather than using one. The research also showed that perceived risk and trust play crucial roles in consumer decision-making, with risk perception directly impacting behavioral intention. Fagan, Neill & Wooldridge (2008) explored the intention to use computers by studying factors such as external motivation, internal motivation, ease of use, and behavioral intention. The study aimed to understand the various influences on the intention to use computers within the conceptual framework.

Research Methodology

The research on Self-Acceptance of the Prototype of the Water Supply Unit Registration Application for Consumers is a mixed-methods research study. This research utilizes both qualitative methods by reviewing documents, textbooks, concepts, theories, and related studies, as well as collecting data through focus groups. The data obtained is analyzed using interpretation analysis, which is a process of developing the application prototype based on user requirements. Additionally, the researcher employs quantitative methods by formulating hypotheses, collecting data using questionnaires, and analyzing the data using inferential statistics to obtain the necessary information for the research.

1. Population and Sample Group

The population studied includes the water users of the Aom Noi branch of the Provincial Waterworks Authority. The sample size was determined using Taro Yamane's formula (Yamane, 1973), resulting in 398 people.

For the quantitative research sample group, the study focused on 66,951 water users of the Aom Noi branch. Using Taro Yamane's formula, the sample size calculated was 398 people.

2. Sampling Method

The researcher employed systematic sampling. This involves arranging the names of all units in the population in a systematic order. The population is divided into equal intervals, determined by the proportion of the sample size to the population. The first unit is selected randomly, and subsequent units are selected at calculated intervals. To account for any potential non-responses, the researcher collected an additional 5% of the sample size, adding 20 more sets, resulting in a total of 418 sets of data.

3. Research Instrument

The data collection tool was a questionnaire, created through the following steps:

Instrument Development Steps:

1) Study theories, documents, and research related to factors affecting the innovation prototype of the self-meter-reading water application to define variables and develop the conceptual framework. Study the process of questionnaire creation from related documents, research, and theories to draft the questionnaire items.

2). Align the questionnaire with the research framework, focusing on the following areas: (1) General information of the respondents, (2) Factors affecting the efficiency of the self-meter-reading water application system, and (3) Questions about the acceptance of the self-meter-reading water application system. Draft the initial version of the questionnaire.

3). Present the drafted questionnaire to experts for content validation and suggestions for improvement.

4). Revise the questionnaire based on expert feedback and present it to the advisor for another round of content validation.

5). Conduct a trial run of the revised questionnaire with a group similar to the study sample, consisting of 30 sets. Analyze the reliability using Cronbach's alpha coefficient.

6). Finalize the questionnaire based on the trial run results and obtain approval from the experts before distribution.

7). Distribute the finalized questionnaire to the sample group.

4. Data Collection

The data collection process involved the following steps:

1. The researcher explained the questionnaire details and content to the representatives and team.

2. The researcher or team representatives visited the target sample areas as specified.

3. The researcher or team representatives distributed the questionnaires to the target group and waited until they were fully completed, answering any questions the respondents had during the process.

5. Data Analysis and Statistics

1. Descriptive Statistics

- Analyze demographic factors of the sample using frequency and percentage statistics.

- Analyze the level of the sample group's opinions on factors influencing the acceptance of the self-meter-reading water application system using mean and standard deviation.

2. Inferential Statistics

- Analyze monthly water usage data and satisfaction with the water billing service of the Aom Noi branch of the Provincial Waterworks Authority. Multiple Regression Analysis was used for quantitative variables, with the significance level set at .05. This analysis aimed to test the prediction of technology acceptance factors influencing the acceptance of the self-meter-reading water application system for the Provincial Waterworks Authority.

Research Framework

Based on a literature review, theoretical concepts, articles, documents, and related research, the researcher has integrated these elements to establish the steps for developing a prototype of a self-meter-reading water application for consumers. The process involved studying the issues and needs of the existing system, analyzing the results, and subsequently designing and developing the prototype of the self-meter-reading water

application for consumers. The next step was to study user acceptance of the prototype, which led to the conceptual framework for researching the acceptance of this innovative self-meter-reading water application for consumers.

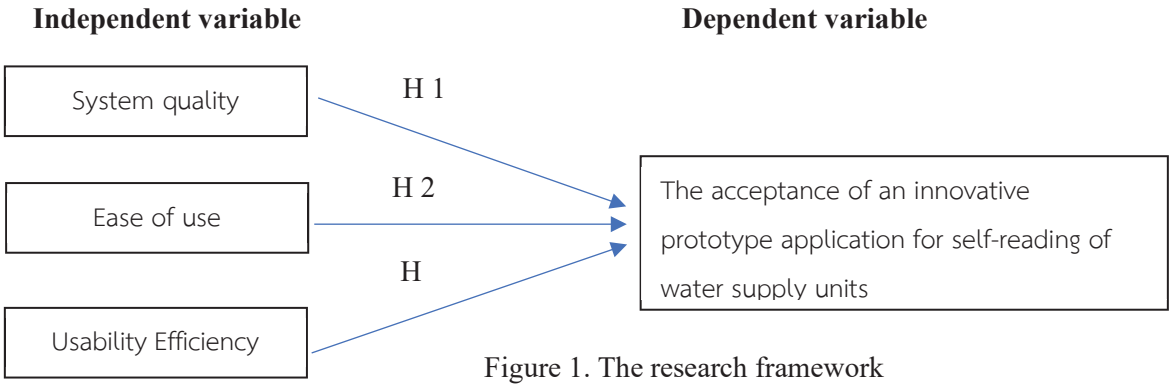

Figure 1. The research framework

Research Findings

The research study on Self-Acceptance of the Prototype of the Water Supply Unit Registration Application for Consumers. The objectives of this research were 1. To study the problems and needs of self-reading water supply units for consumers, 2. To develop an innovative prototype application for self-reading water supply units for consumers and 3. To study the factors affecting the acceptance of an innovative prototype application for self-reading of water supply units for consumers. This study employs descriptive statistics and inferential statistics methods to obtain the necessary data. The researcher collected data from 418 completed questionnaires, achieving a 100% response rate. The results from the questionnaires will be analyzed in the following steps using descriptive statistics, including percentage, means, and standard deviation, and inferential statistics to test hypotheses, including multiple regression analysis. The researcher analyzed the data, tested the hypotheses, and presented the analysis in four parts: 1) Preliminary data analysis of the respondents. 2) General data analysis of the respondents using descriptive statistics, including means, standard deviation, and interpretation. 3) Results of the multiple regression analysis. 4) Summary of the hypothesis testing results.

1) Preliminary Data Analysis of Survey Respondents

Descriptive Statistics Analysis: The researcher used descriptive statistics, including frequency distribution and percentage, to describe the general characteristics of the survey respondents. The general data variables analyzed included gender, age, occupation, type of residence, average monthly water bill, and payment method for water bills. The study found that the majority of respondents were female, totaling 226 individuals, accounting for 54.10%. The next largest group was male, with 192 individuals, accounting for 45.90%.

2) General Data Analysis of Survey Respondents using Descriptive Statistics: Mean, Standard Deviation, and Interpretation

System Quality: The system quality was rated at a medium level ($\bar{x}$ = 2.67) with a standard deviation (S.D.) of 1.14. Breaking it down by specific items, the database accuracy received the highest average score at a medium level ($\bar{x}$ = 2.78), followed by the system's ability to present data ($\bar{x}$ = 2.71), the ability to add data ($\bar{x}$ = 2.65), and the ability to update data ($\bar{x}$= 2.64). The lowest average score was for the ease of querying the database ($\bar{x}$ = 2.58), but it was still at a medium level.

Ease of Use: The ease of use was rated at a medium level ($\bar{x}$= 2.74) with an S.D. of 1.17. Analyzing specific items, the overall appeal of the system had the highest average score at a medium level ($\bar{x}$ = 2.83),

followed by ease of access ($\bar{X}$ = 2.75), clarity of on-screen messages ($\bar{X}$ = 2.74), and the appropriateness of screen design ($\bar{X}$ = 2.71). The lowest average score was for the ease of calling up the system ($\bar{X}$= 2.66), still at a medium level.

Usability Efficiency: Efficiency was rated at a medium level ($\bar{X}$ = 2.84) with an S.D. of 1.09. For specific items, the speed of display had the highest average score at a moderate level ($\bar{X}$ = 2.86), followed by the speed of database interaction ($\bar{X}$ = 2.85), the speed of data presentation ($\bar{X}$= 2.84), and overall system operation speed ($\bar{X}$ = 2.80). The lowest average score was for the speed of saving and updating data ($\bar{X}$= 2.66), but it remained at a medium level.

Application Prototype Acceptance: Acceptance of the application prototype was rated at a medium level ($\bar{X}$ = 2.62) with an S.D. of 1.20. Specific items showed that the intention to regularly use the application for transactions with the Provincial Waterworks Authority, Aom Noi Branch, Nakhon Pathom, had the highest average score at a medium level. ($\bar{X}$= 2.67), followed by the intention to continue using the application in the future ($\bar{X}$ = 2.63), willingness to train until proficient ($\bar{X}$ = 2.61), and willingness to recommend the application to neighbors ($\bar{X}$ = 2.60). The lowest average score was for satisfaction with using the application for transactions with the Provincial Waterworks Authority, Aom Noi Branch ($\bar{X}$ = 2.57), but it was still at a medium level.

3) Hypothesis Testing Results

Analysis Results, The results from the multiple linear regression analysis indicate that the factors significantly positively influencing the acceptance of the innovative water meter application prototype for self-consumers in the Provincial Waterworks Authority, at the .05 level, include ease of use (Sig. = .006) and efficiency (Sig. = .000). However, system quality (Sig. = .066) does not have a significant positive influence on the acceptance of the innovative water meter application prototype for self-consumers in the Provincial Waterworks Authority.

The independent variables positively influencing the acceptance of the innovative water meter application prototype for self-consumers in the Provincial Waterworks Authority include efficiency (ß = .590) and ease of use (ß = .166).

Coefficient of Determination, The analysis of the coefficient of determination (AR^2= .655) reveals that system quality, ease of use, and efficiency positively influence the acceptance of the innovative water meter application prototype for self-consumers in the Provincial Waterworks Authority, accounting for 65.50%. Specifically, the independent variables of ease of use and efficiency influence the acceptance of the innovative water meter application prototype for self-consumers in the Provincial Waterworks Authority, while system quality does not. The coefficient of determination (R^2= .658) accounts for 65.80%.

4) Hypothesis Testing Summary

Hypothesis 1: System quality does not influence the acceptance of the innovative water meter application prototype for self-consumers in the Provincial Waterworks Authority found that accept the null hypothesis (H0) the System quality does not influence the acceptance.

Hypothesis 2: Ease of use influences the acceptance of the innovative water meter application prototype for self-consumers in the Provincial Waterworks Authority found that reject the null hypothesis (H0) - Ease of use influences the acceptance.

Hypothesis 3: System efficiency influences the acceptance of the innovative water meter application prototype for self-consumers in the Provincial Waterworks Authority, found that reject the null hypothesis (H0) - System efficiency influences the acceptance.

Discussion

Research Findings Based on Objectives 1 To study the problems and needs of self-reading water supply units for consumers, the result was analysis the multiple linear regression analysis found that system quality, ease of use, and system efficiency influence the acceptance of the innovative self-consumer water meter application prototype for the Provincial Waterworks Authority, accounting for 65.5% at a statistical significance level of .05. When considering the impact weight of the independent variables on the acceptance of the innovative application prototype, system quality had the greatest impact.

Research Findings Based on Objective 2, to develop an innovative prototype application for self-reading water supply units for consumers, to develop the innovative self-consumer water meter application prototype, the researcher studied the needs of water users in the Aom Noi branch of the Provincial Waterworks Authority. The prototype application includes three main functions: 1) billing/invoice and receipt system, 2) information about the PWA, and 3) user information system. The application was developed based on user needs, making it convenient and easy to use.

Research Findings Based on Objective 3 to study the factors affecting the acceptance of an innovative prototype application for self-reading of water supply units for consumers analyzed the multiple linear regression analysis found that system quality, ease of use, and system efficiency influence the acceptance of the innovative self-consumer water meter application prototype for the Provincial Waterworks Authority, accounting for 65.8% at a statistical significance level of .05. When considering the impact weight of the independent variables on the acceptance of the innovative application prototype, system quality and system efficiency had the greatest impact. This is consistent with the research by Nawapat Suphasinwat (2017), who developed a Chatbot system for online messaging in commerce, finding that the system met the objectives. The users evaluated and were satisfied with the system. Similarly, Phachara Deecharoen's (2020) research on factors influencing the acceptance of the DLT GPS application in buses by Mongkolchai Transport Co., Ltd. found that technology acceptance factors, including perceived ease of use and attitudes toward usage, influenced the acceptance of the application. The research demonstrated that the sample group perceived the application as easy to use due to its straightforward steps, accessible design, and clear categorization. Testing showed that the system was functional, safe, reliable, and capable of meeting user needs efficiently, leading to satisfaction with the prototype. This may be attributed to the ease and free availability of the LINE application, its accessibility anytime and anywhere, and its rapid response as an automated system, provided that the necessary network signal and equipment are available, fostering an intention to use the application.

Recommendations

The research suggestions for future research, to broaden the scope of this study and provide more comprehensive insights into the acceptance of the innovative self-consumer water meter application or related issues, the researcher suggests the following topics for future research:

1. Study Different Population Groups, Conduct research with other population/sample groups in different branches of the Provincial Waterworks Authority. Since the self-consumer water meter application is not limited to just one branch and is intended to provide general service, it is important to study different populations in various locations to gain clearer insights into local and regional usage differences. Rationale, this approach will help to understand how the application is received across different demographics and geographic areas, providing more comprehensive data on its acceptance and usability.

2. Study Additional Related Variables, Investigate other variables that might be related to the ones already studied. For example, examining the influence of demographic differences on the decision to use the self-consumer water meter application could lead to designing more targeted applications. Additionally, consider incorporating other potentially significant factors, such as application quality and the diversity of application services. Rationale, Exploring these variables will provide more detailed and useful information, potentially leading to the development of applications that better cater to specific user groups and enhance overall user satisfaction and acceptance.

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