

# Exploring the Factors Influencing an Organisation in Thailand to Adopt Cloud Computing Platforms

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Received: April 2021.

Revised: June, 2021.

Accepted: July, 2021.

## Abstract

This research is aimed to explore the factors influencing organizations in Thailand to adopt to cloud computing platforms. The study was conducted utilizing the theory of planned behavior (attitude toward the behavior, subjective norms, perceived behavioral control) with an additional factor known as the perceived usefulness, perceived ease of use, and satisfaction to predict companies' intention to adopt to cloud. The research was conducted as a quantitative analysis with descriptive and inferential research with a sample size of 284 respondents who have had some experience with cloud computing services. The results of this research were analyzed using simple and multiple linear regression. The finding shows most of the variables have significantly influenced cloud adoption intention. Interestingly, technology impacts perceived usefulness, Perceived ease of use as well as satisfaction. There is a need for proper knowledge sharing, training for Thailand people to use cloud computing platforms.

**Keywords:** Cloud computing, Cloud adoption, Cloud platforms, Perceived usefulness, Technology adoption model

## 1. Introduction

Cloud computing is a new type of IT services via software, platform, and infrastructure via internet technologies through some cloud services providers. NIST defines cloud computing, 2009 as a model for enabling easy to use, available on-demand resources access to a shared platform of configurable computing services (e.g. networks, databases, servers, storage etc.), which can be provisioned quickly, and released with minimum management efforts or support. Cloud computing comprises three basic service levels: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS). IaaS is bare metal or basic cloud services that provide infrastructure services to customers over the internet.

With the Technological transformation in place, and the current impact of COVID-19 situation, cloud computing has become the talk of town in the whole world along with Thailand. Thailand's cloud computing business is getting a lot of importance as Thailand has a lot of IT companies, E-commerce channels. There are a lot of cloud service providers like Amazon Web services, Microsoft Azure, and Google Cloud. It is pretty easy to start up an IT ecosystem with cloud computing in place. Cloud Computing service provides many advantages, including cost, scalability, flexibility, automatic updates, and upgrades for the software, and applications. There are lots of existing companies in Thailand, which are already using a lot of cloud products. The cloud computing usage in Thailand is expected to surpass 15 billion baht in value by 2024 with CAGR of around 19% since 2018, with the sudden digital transformation revolution of businesses due to pandemic, as per global research firm IDC.

### 1.1 Statement of Problem:

Cloud computing adoption has various drivers including technology, organizational competency, external environment etc. Technology is foremost the most impacting factor of cloud computing adoption. Even though Cloud computing platforms provide a very easy way to develop the application, still there are misconceptions that it is not easier to move the on-prem application to cloud computing platforms. This research is focussed on the ease of using cloud computing platforms which leads the businesses in Thailand to adopt cloud computing platforms.

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## 1.2 Research objective

1.2.1 To explore the effect of technology on ease of use and usefulness of cloud computing platforms.

1.2.2 To purpose cloud computing platforms on the various factors they should focus to persuade customers to adopt their platforms

## 2. Literature Review

### 2.1 Technology

The Relative advantage of a technology in place its other alternatives provide good insights about the adoption in any company or business. Most companies have a quite large budget for IT spending. With the total percentage of total money spent on IT infrastructure, only about 10 percent of the servers are being used (Marston *et al.*, 2011). Cloud computing provides a good platform for organisations to focus on their core competencies instead of wasting time on resources in managing the IT platforms. As far as cloud adoption is concerned, it can be evaluated by the time used in performing various tasks, integrating the existing applications with the other cloud infrastructures or applications, interface, storages, features etc. All of these factors impact the technology relevance, and cloud computing platforms' acceptance.

### 2.2 Perceived Usefulness

Usefulness is another factor in the whole process as when users mostly tend to believe that using the latest cloud application can further enhance their business growth, and productivity, and this can only persuade them to move to a whole new cloud infrastructure (Senk, 2013). Steel, and Hudson (2001) concluded in the research related to the faculty's thought process towards the usefulness of technology. Many other researchers have concluded the similar information about PU as a factor that can directly relate technology adoption, and satisfaction.

### 2.3 Perceived ease of use

Ease of use of cloud services another major contributor for using cloud services as users can make desired usage of cloud platforms without actually going into details or it or without having in-depth understanding about the operation, and setup or installation of technology in question (CIO, 2011). A lot of researchers have laid emphasis on the PEOU of technology. It helps in comparing the latest technology with existing technology. Keengwe, Kidd, and Kyei-Blankson (2009) also talked about the PEOU, and its beliefs that are presumed to influence the perception about new technology, and the relation between various other external variables, and attitude towards technology (Porter & Donthu, 2006, p. 1000).

### 2.4 Satisfaction

Satisfaction is related to behavioral as well as intentional loyalty (Mittal, and Kamakura, 2001; Seiders *et al.*, 2005; Szymanski, and Henard, 2001). In some cases, purchase intention in an industry may vary among the various products or situations but can still lead to the same satisfaction level (Szymanski, and Henard, 2001). Satisfaction majorly leads to a good purchase or adoption intention.

### 2.5 Adoption intention

Cloud adoption intention is the output of the satisfaction employees or companies get once they do initial testing of cloud platforms, and services. As stated by Ayeh, and Law (2013), investigating users' adoption intention is based on the TAM model. Further, various literatures were found about the various studies on cloud computing adoption via traditional adoption frameworks such as Alshamaila *et al.* (2013), and Low *et al.* (2011) used TOE

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framework, and Wu (2011) used TAM model. With regards to the adoption model, the diffusion of innovations (DOI) (Rogers Everett, 1995), TAM, and TOE framework (Tornatzky, and Fleischer, 1990) are the two most accepted theories used by researchers to understand, and evaluate the adoption, and use of any new technology any organization.

### 3. Research Framework & Methodology

The conceptual framework is designed based on the TAM Model. To the extent of the study of cloud adoption of Thai organisations, technology is added as the independent variable toward perceived usefulness, perceived ease of use, and satisfaction. (see figure1)

#### 3.1. Conceptual framework

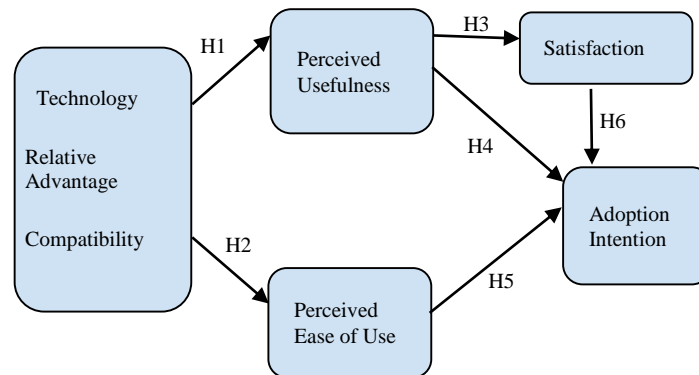


Figure1: Conceptual Framework

#### 3.2 Research hypothesis

**H<sub>1</sub>** : There is a statistical significant influence of technology on perceived usefulness.

**H<sub>2</sub>** : There is a statistical significant influence of technology on perceived ease of use.

**H<sub>3</sub>** : There is a statistical significant influence of perceived usefulness on satisfaction.

**H<sub>4</sub>** : There is a statistical significant influence of perceived usefulness on cloud computing adoption intention.

**H<sub>5</sub>** : There is a statistical significant influence of perceived ease of use on cloud computing adoption intention.

**H<sub>6</sub>** : There is a statistical significant influence of satisfaction on cloud computing adoption.

### 4. Research Methodology

Quantitative methods are used to analyze through data from questionnaires. The Cronbach's alpha approach was used to test the reliability of the questions prior to commencing the distribution of survey to all the respondents. Later on, data analysis was done by calculating statistics, mean, correlation, single, and multiple linear regressions were applied to analyze to find the results. In addition, the Likert scale model is used in the questionnaire. This research applies 5 Likert scale which rank from “Strongly disagree (1)” to “Strongly agree (5)”

#### 4.1 Population and Sample:

Snowball sampling as part of non-probability sampling is used for getting the responses for this research process due to time constraint. This research was conducted via google forms to collect data on the basis of questionnaire surveys from people living in Thailand using two languages- Thailand and English so that it is understandable to both Thai and Expats living in Thailand. As per the world population review, the total population of Thailand is approximately 69.43 million. Thus, the sample size for this research is 284 respondents as determined by the sample size.

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## 4.2 Reliability test (Cronbach's Alpha)

The reliability test was done from 30 respondents to identify the reliability of the questions before distributing the questionnaire at full scale for research. The results were imported to SPSS to do further analysis. (see Table 1).

**Table 1:** Cronbach's alpha

| Variables               | Cronbach's Alpha | Items |
|-------------------------|------------------|-------|
| Technology (TE)         | .697             | 3     |
| PU                      | .761             | 3     |
| PEOU                    | .827             | 3     |
| Satisfaction (SA)       | .895             | 3     |
| Adoption intention (AI) | .641             | 3     |

## 5. Result and Discussion

The result is derived with the help of the SPSS tool via statistical analysis using the demographic, and inferential analysis by conducting hypothesis testing, correlation, and regression.

Total 284 people responded to the survey, who had experience with cloud computing products.

### 5.1 Demographics:

Detailed information is as below for demographics (see Table 2).

**Table 2:** Demographic analysis

| General      | Characteristic     | Frequency | Percentage |
|--------------|--------------------|-----------|------------|
| Age          | Less than 30 Years | 174       | 61.3       |
|              | 30-35 Years old    | 76        | 26.8       |
|              | More than 35 Years | 12        | 12.0       |
| Gender       | Male               | 155       | 54.6       |
|              | Female             | 126       | 44.4       |
|              | Prefer Not to Say  | 3         | 1.1        |
| Organisation | Government         | 14        | 2.6        |
|              | Education          | 25        | 4.7        |
|              | Product based      | 37        | 6.9        |
|              | Energy             | 94        | 17.5       |
|              | Ecommerce          | 46        | 8.6        |
|              | IT/Gaming          | 63        | 11.8       |
|              | Others             | 5         | 0.9        |

The demographic profile of gender shows that the most of respondents are Male -54.6% (155) followed by female - 44.4% (126). In terms of age, data tells that the maximum number of people are from age less than 30 years old (61.3%), followed by 31-35 years old (26.8%), and above 35 years old (12%). According to information provided in the above table, 17.5% most of respondents worked at energy firms, followed by the IT/Gaming 11.8%.

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## 5.2 Hypothesis testing

As per the designed conceptual framework, hypotheses are 6. (see Table 3).

**Table 3:** Simple linear Regression results of Hypothesis H<sub>10</sub>

| Hypothesis        | Variable   | Standardized Coefficient | P-Value Sig | VIF   |
|-------------------|------------|--------------------------|-------------|-------|
| H <sub>1a</sub>   | Technology | .701                     | .001        | 1.000 |
| R Square          | .492       |                          |             |       |
| Adjusted R Square | .490       |                          |             |       |

As shown in table 3, Technology has statistical influence of Perceived Usefulness. Every 1 unit increase in Technology, Perceived Usefulness will increase by 70.1%. Also, 49.0% of Perceived Usefulness can be explained by Technology as per results from data collected and analysed via SPSS.

**Table 4:** Simple linear Regression results of Hypothesis H<sub>2</sub>

| Hypothesis        | Variable   | Standardized Coefficient | P-Value Sig | VIF   |
|-------------------|------------|--------------------------|-------------|-------|
| H <sub>2a</sub>   | Technology | .661                     | .001        | 1.000 |
| R Square          | .436       |                          |             |       |
| Adjusted R Square | .434       |                          |             |       |

As shown in table 4, Technology has statistical influence of Perceived ease of use. Every 1 unit increase in Technology, Perceived ease of use will increase by 66.1%. Technology can explain 43.4% of Perceived ease of use as per results from data collected and analysed via SPSS.

**Table 5:** Simple linear Regression results of Hypothesis H<sub>3</sub>

| Hypothesis        | Variable             | Standardized Coefficient | P-Value Sig | VIF   |
|-------------------|----------------------|--------------------------|-------------|-------|
| H <sub>3a</sub>   | Perceived Usefulness | .651                     | .001        | 1.000 |
| R Square          | .424                 |                          |             |       |
| Adjusted R Square | .422                 |                          |             |       |

As shown in the table 5, PU has statistical influence on satisfaction. Every 1 unit increase in PU, Satisfaction will increase by 65.1%. Also, 42.2% of satisfaction can be explained by PU as per results from data collected and analysed via SPSS.

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### 5.3 Adoption Intention

**Table 6:** Multiple linear Regression results of Hypothesis H<sub>4</sub>, H<sub>5</sub>, H<sub>6</sub>

| Hypothesis        | Variable | Standardized Coefficient | P-Value Sig | VIF   |
|-------------------|----------|--------------------------|-------------|-------|
| H <sub>4a</sub>   | PU       | .333                     | .001        | 1.984 |
| H <sub>5a</sub>   | PEOU     | .094                     | .067        | 2.095 |
| H <sub>6a</sub>   | SA       | .476                     | .001        | 2.161 |
| R Square          | .652     |                          |             |       |
| Adjusted R Square | .648     |                          |             |       |

As per the result from the table 6, there is influence of PU, and Satisfaction on the Adoption Intention however there is not enough data to conclude that PEOU has influence on adoption intention since P value is more than 0.05. From the output post analysing, 1-unit increase in PU, Adoption intention will increase by 33.3%., and with the 1-unit increase in satisfaction, adoption intention will increase by 47.6%.

The results from the research help to understand that cloud adoption intention is significantly influenced by various factors like perceived usefulness and satisfaction, however the data is not enough to suggest the similar relationship between cloud adoption intention and perceived ease of use which can be analysed further in future researches.

### 6. Conclusions and Recommendations

This survey was conducted from 284 respondents (male, and female). Contribution percentage shows male are slightly more than females at 54.6% (155) and 44.4% (126) working in Thailand based organisations. Research also states that all kinds of industry sectors are using cloud computing products. From the research conducted, it can be concluded that the cloud adoption intention increases if the technology is compatible with on-prem infrastructure, easy to use. It also increases productivity of employees working in the organisation, and helps businesses to focus on their core business capabilities.

This study can be beneficial for the cloud computing organisations in exploring the variables, which can directly or indirectly impact the cloud computing adoption in an organisation in Thailand. Cloud computing providers must lay emphasis on making the cloud portals easier to navigate, and make technology more compatible to the on-premise environments. Perceived usefulness leads to increase in business productivity for the firms, which can be used as a projected benefit of cloud platforms, this will help cloud providers to persuade the organisations to adopt cloud platforms. Cloud computing product managers should still focus on providing proper training, youtube training videos, quarterly knowledge sharing about new services, and making the products more user friendly. The cloud computing services are not easy to integrate with on premise environments, so companies may focus on making better migration tools, and connectivity solutions to make the cloud products more integrated with on-premise environments. Users are quite satisfied with the cloud product they are using, and will continue to move the services onto cloud platforms in near future. Thus, this study will further help to contribute to cloud computing adoption studies in future. This study is still limited as there are other factors of cloud computing adoption, which are not yet discussed as part of this research. The present study is in regard to the context of Thai people or expats living, and working in Thailand. This research was conducted in a span of three months; this time is limited to cover various aspects of cloud computing adoption in Thailand. Factors like organizational environment, price of cloud services, the external environment could be the other important factors for further studies.

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