International Journal of Innovation and Applied Studies
ISSN 2028-9324 Vol. 10 No. 1 Jan. 2015, pp. 138-148

http://www.ijias.issr-journals.org/

# Determinants of Software-as-a-Service Adoption and Intention to Use for Enterprise Applications

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**ABSTRACT:** With the increasing popularity of cloud computing, many vendors have entered the software as a service (SaaS) market to provide new services and applications. Although cloud computing services make new demands and seek added value through the Internet, SaaS is still in the early stages of development, and is subject to build a cloud environment so the development is limited. However, the adoption of cloud computing services still remains very low in Taiwan. Research has been carried out to explore issues related to the cloud computing services, but there is still a lack of research in this field and research of cloud computing services remains extremely limited, thus offering insufficient evidence as to how effective adoption and successful diffusion of advanced information systems is explicitly excluded in the context of cloud computing services. Therefore, this study intends to explore the identified factors affecting the adoption of cloud computing SaaS in Taiwan by developing a comprehensive research framework. This study adopted technology acceptance model (TAM) to explore the relationships between constructs and their effect on users' intention to use SaaS. Data was collected using a self-administered survey to test the hypotheses. This study used SPSS to compute descriptive statistics. The proposed model was then estimated using the partial least squares (PLS) regression technique and SmartPLS 3.0 to analyze the measurement and structural models. The results of the analysis supported all hypotheses. Some recommendations and identify limitations of this study were provided for future research.

**KEYWORDS:** Software-as-a-Service, SaaS, Enterprise Applications, cloud computing, Internet.

## 1 INTRODUCTION

In The increasing popularity of cloud computing and availability of transform service solution has enabled a convenient, on-demand network for business to drive new technologies and access to new markets. Cloud computing empowers IT through flexible, automated infrastructures, new on-demand service models and new levels of IT efficiency. The emerging adoption of cloud computing has become a way to reduce costs, improve services and simplify management. Cloud computing allows enterprises using computing resources such as hardware and software to deliver a service over the Internet [1]. The cloud computing technology stack and its customization and permeability across the enterprise are the primary factors that are revolutionizing the economics of cloud computing. The agility of the cloud computing stack is also re-ordering the capital expense spending levels of companies, drastically reducing them as these series of technologies make it possible to subscribe to only those applications and features that deliver the greatest value to a given business or process. The inherent advantages of cloud computing and the agility of configuration for the applications lead to greater levels of customer satisfaction and greater user intention to adopt advanced technologies [2].

Cloud computing delivers valuable contributions to an enterprise, particularly SaaS—an attractive model for small and medium enterprises (SMEs) that try to cut costs and at the same time increase the flexibility of their IT environment. According to Gartner Research [3], 77% of respondents expected to increase spending on SaaS, while 17% plan to keep spending the same. More than 80 percent of respondents in Brazil and Asia/Pacific indicated more spending on SaaS applications over the next two years. The US and European countries were not far behind with 73% of US respondents and

71% of European respondents intending to increase spending on SaaS [4]. With adoption of SaaS for enterprise applications on the rise worldwide, including Asia-Pacific, SaaS revenue in the region is expected to jump to $934.1 million USD from $730.9 million USD in 2011. In 2012, Gartner research reported that global SaaS revenue would grow 17.9 percent to reach $14.5 billion USD, up from $12.3 billion USD the year before [5]. In general, cloud computing is a marketing term and is known as cloud technology, cloud applications, or cloud-based services that provide computation, software, data access and storage services, which do not require end-user knowledge of the physical location and configuration of the system that delivers the services [6]. A parallel to this concept can be drawn with the electricity grid; wherein end-users consume power without needing to understand the component devices or infrastructure required to provide the service. More specifically, cloud computing allows businesses to use applications from the provider without installation and access their personal files at any computer with Internet access [7]. This technology allows business for much more efficient computing by centralizing data storage, processing and bandwidth. Thus, the user has no control on the internals, but is just able to use these resources as he receives them.

Despite cloud computing services' increasing significance in the nascent and fast-growing market, there is evidence of significant gaps between expectations and the experiences of enterprises. Although research has been carried out to explore issues related to the cloud computing services, there is still a lack of research in this field, and research of cloud computing services remain extremely limited, thus offering insufficient evidence as to how effective adoption and diffusion of information systems success is explicitly excluded in the context of cloud computing services. Therefore, this study intends to explore the determinants of users' intention in SaaS cloud computing services adoption. Considerable prior research endeavors to examine the effectiveness of Technology Acceptance Model (TAM), evaluation and acceptance. Many researchers endeavor to explore various relationships focused on integrating TAM as well as extensions and tests of their model [8].Therefore, based on the theoretical foundation of TAM [9], this study examines the extent to which enterprise employees' perception of their understanding the cloud computing SaaS services and determines the factors how it affects user intention. To achieve the above objectives, a review of the relevant literature is presented as groundwork in the next section. Section 3 describes the research model and the hypotheses to be tested. Section 4 facilitates discussion on research methodology; section 5 explores the conclusions, the limitations, and solutions of current research work.

## 2 THEORETICAL BACKGROUND

### 2.1 SAAS CLOUD COMPUTING SERVICES

The pervasive nature of cloud computing is reordering the economics of software and the balance of power in enterprises. As cloud computing continues to proliferate, cloud computing represents a fundamental change in the way information technology (IT) services and it has been exploding in popularity in today's business world [10]. Software-as-a Service (SaaS) is the most-commonly used delivery model in the cloud computing services and rapidly gaining adoption in enterprises. The economic benefits of using SaaS cloud computing are making its applicability pervasive and widely adopted, as enterprises can subscribe to only those features and applications they find of the most value. SaaS intends to provide a method for cost-effective software application delivery to business and general users. With SaaS, businesses can consume applications that are hosted online, enabling them to lower their costs by paying only for what they use, enjoy seamless and painless upgrades in functionality, and integrate easily with their existing data and systems. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings [11].

The SaaS layer of the cloud computing stack is also where the majority of enterprise software companies deliver their applications including those that are ERP-, CRM- and SCM-based. The cloud technology stack has made this customization and tailoring of enterprise software applications possible. The degree of customization is particularly appealing to large-scale enterprises that have in the past been forced to use monolithic, difficult to customize ERP, CRM and SCM applications. The inherent advantages of cloud computing and the agility of configuration for the applications lead to greater levels of customer satisfaction and greater user intention to adopt advanced technologies [12] [13]. Arinze and Anandarajan [14] indicated that there are statistically significant higher levels of satisfaction and intention to with cloud-based applications relative to their on-premise counterparts precisely due to the greater levels of customization and tailoring to specific internal needs. Benlian and Hess [15] examined the value that was being offered to people who chose to use SaaS, as that would help them to determine the future potential of SaaS as it related to the IT industry. However, the majority of the arguments that lean in that direction have been made by individuals who believe that SaaS is not offering the level of value that was originally expected of it. The main reason they feel that SaaS is lacking in value is because there were many problems with the deployment of it in the beginning. At that point, there was a concern that the application would not work well because it was not ready when it was first made available. Many people who have trouble with a software application in the beginning

will not return to the application later to see if it has improved. SaaS can be considered a part of the nomenclature of cloud computing along with IaaS and PaaS. SaaS provides the user with access to the created applications or services that are operating in the cloud [16].

The use of cloud services is a groundbreaking alternative that enables organizations to pay only for what they use with regard to computing and network resources, rather than having to invest in upgrading data centers, not to mention hiring requisite staff to deal with all the hardware and software. Cloud computing services enable enterprises to focus on other aspects of operations by freeing up key resources previously dedicated to other IT service. It enables convenient, on-demand network access to a shared pool of configurable computing resources to offer users needs from word processing software to email, and deliver to the user through the Internet rather than requiring that a software program be installed on a computer hard drive [17]. Although SaaS does have its drawbacks, but there are many benefits that can be had for the right company at the right time, and with the right application. Because there are a number of risks that have to be calculated, it is not possible to say whether SaaS will be a good fit for all companies or IT applications. Instead, it is only possible to address what has been discovered about SaaS and what current IT professionals think about what it has to offer. There is generally always some fear when it comes to change, and that is true with technology as much as anything else. When companies are fearful, they will hold off on trying SaaS, even if they see that there is ease of use and usefulness available to them [15]. In the present study, the cloud is the new operating system and services are the new applications for enterprises. Based on the TAM, this study seeks to measure SaaS cloud computing services adoption success. The following offers a brief discussion of the importance of the TAM, and how it measures the success or effectiveness of operating systems and services in SaaS cloud computing services.

### 2.2 TECHNOLOGY ACCEPTANCE MODEL

Technology acceptance model (TAM), introduced by Davis [13], was created based on the aforementioned theory of reasoned action (TRA) [18] to explain system use and to measure technology acceptance. Perceived usefulness is vital to a business when considering whether to adopt a new technology [19]. If it is not believed that using the new technology will enhance job performance, the person will not find the technology useful enough to adopt it [20]. There are exceptions to this rule, of course, but that is generally the case with most people and most companies. The ease of use of the new technology also matters. A person does not want to go from using something he or she is used to working with to something that is complex, complicated, or difficult to deal with [19]. There would be no real point to doing that unless there was a large benefit, and most people do not or cannot see a benefit if they are going to have to learn a lot of new information and spend a lot of time determining how to work new technology. The new technology should make their lives (and jobs) easier right from the start, or it has a low chance of getting adopted [20]. Through the use of the TAM, however, it provides links to explain how external variables influence beliefs, attitude, behavioral intention to use, and the actual usage. TAM also proposes that actual use of a technology system is affected by external factors through mediated effects on perceived usefulness and perceived ease of use. Figure 1 depicts the original TAM by Davis [13].

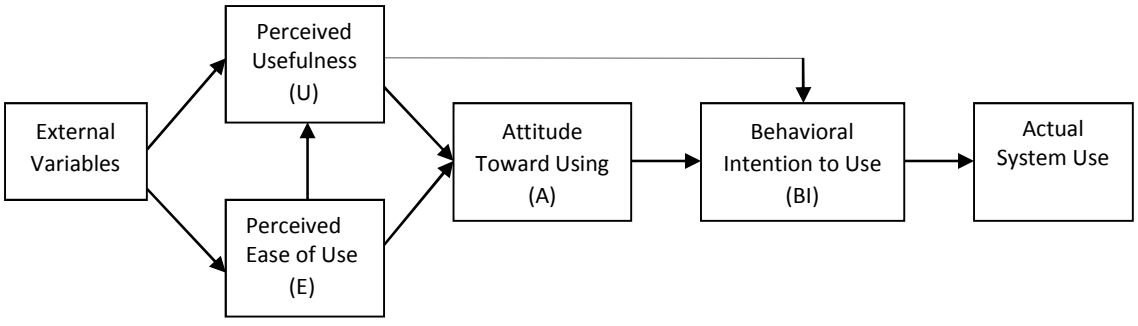


***Fig. 1. The original technology acceptance model (TAM) (Davis, 1989)***

By using the TAM a company can make a determination about SaaS and whether it will be a good fit or something that would be better left alone [19]. Having information in the cloud is not for everyone. It is difficult to argue that there is ease of use there, because there is no need to store anything on the company's servers. That uses less space, and the data retrieval is very easy.

## 3 RESEARCH MODEL AND HYPOTHESES

The conceptual framework related to the background and motivation of this study from a review of prior, relevant literature on cloud computing SaaS service is constructed and represented in Figure 2. As shown in Figure 2, this study builds on the prior technology acceptance research by adopting a new technology. Therefore, this affecting the adoption of cloud computing SaaS service by examining the relationships that comprise the TAM. The extended TAM was served as the theoretical framework to explore the identified factors affecting the adoption of cloud computing SaaS service. The research model included three independent dimensions, cost effectiveness, and information security and privacy, convenience. These constructs were hypothesized to predict user intention through moderators of perceived usefulness and perceived ease of use. Perceived usefulness is also influenced by perceived ease of use. Accordingly, perceived usefulness and perceived ease of use are the two factors affect the user intention for adopting SaaS service, and the user intention.

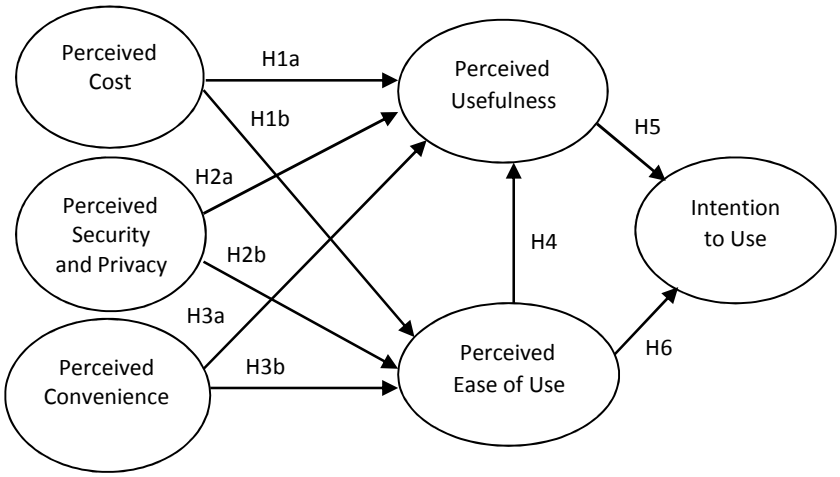


***Fig. 2. The research model***

### 3.1 PERCEIVED COST, PERCEIVED USEFULNESS, AND PERCEIVED EASE OF USE

Perceived cost is an important issue in the SaaS cloud computing services in which companies has the capability to pay for service. Fernando et al. [6] proposed that the effective use of a cloud computing service is the gap between customers' expectation and their perception of service. There are many valid reasons to use SaaS. One of them is the cost; since it is much less expensive to use SaaS once it has been deployed and implemented by the company. That is generally true of cloud based applications, but they are not always the right choice for a particular company's needs [15]. Once SaaS is up and running for a company it is generally not too costly, but until that takes place there are many costs involved [20]. However, perceived cost is the concerns associated with the costs of purchasing the necessary equipment for the use of virtual reality. Perceived cost is the perceived quantifiable costs of acquisition and use of technology. Perceived cost is defined as the extent to which a user believes that using mobile banking services will cost money [21]. Pantano and Pietro [22] indicated that users' belief of the cost concerning the new technology usage. If it is high, they will unwilling to the effective usage, thus high cost of value-added service provided by the technology would be negatively affected their intention to adopt the technology. In addition, perceived usefulness is particularly important in predicting intentions to continue using the technology. Thus, the usefulness is a serious question because of the security concerns and the cost of implementation and deployment [20]. However, based on the above discussion, this study seeks to test the following hypotheses:

H1a: Perceived cost negatively affects perceived usefulness of SaaS cloud computing services.

H1b: Perceived cost negatively affects perceived ease of use with SaaS cloud computing services.

### 3.2 PERCEIVED SECURITY AND PRIVACY, PERCEIVED USEFULNESS, AND PERCEIVED EASE OF USE

The usefulness is a serious question because of the security concerns and the cost of implementation and deployment. The security concerns are very important for many companies, especially those that have sensitive data stored. When they keep it on their servers they are able to carefully control who has access to it. They also know the security measures that are

being taken and the programs that are being run [20]. Security concerns regarding the cloud computing such as virtualization, control, and associated data integrity, shuffling of data, and data integrity concerns at remote places. Thus, prevention security or innovations methods require to be adopted to ensure about system of enhanced and security of information. The security must protect information from an authorized access to other users and to outside parties, while information is in the cloud provider and also information is in the passing in internet among the user and provider [23]. However, many studies indicated that privacy and security concerns were found to be important barriers to use online services. Kalakota and Whinston [24] defined that security is a threat which creates "circumstances, condition, or event with the potential to cause economic hardship to data or network resources in the form of destruction, disclosure, modification of data, denial of service and/or fraud, waste and abuse". Lallmahamood [25] defined that perceived security and privacy is users' perception of security protection against threats and control of their personal data information during the online activity. Thus, the following hypotheses are proposed.

H2a: Perceived security and privacy positively affects perceived usefulness of SaaS cloud computing services.

H2b: Perceived security and privacy positively affects perceived ease of use with SaaS cloud computing services.

### 3.3 PERCEIVED CONVENIENCE, PERCEIVED USEFULNESS, AND PERCEIVED EASE OF USE

Rahimli [23] indicated that the convenience of doing large computation fast on demand can save user and organization cost and times and because of the more fast response time feasible with processors on the cloud computer. Revels et al. [26] argued that users' ability to access web service at their own convenience anytime anywhere clearly highlights the usefulness of the service. If users understand that they can constantly connect to the service whenever required, they are more likely to perceive the service as useful. This, in turn, will result in satisfaction with the service and increase the likelihood of them using the service. Davis [13] perceived ease of use is defined as "the degree to which and individual believes that using a particular system would be free of physical and mental effort." Perceived usefulness is defined as the degree to which an individual believes that using a particular system would enhance his or her job performance. Yoon and Kim [27] defined perceived convenience as a level of convenience toward time, place and execution that users perceive when using the specific technology to complete a task. Chang et al. [28] also defined perceived convenience as a level of convenience toward time, place and execution that users feel when performing a task. As demonstrated in many studies, it is expected that cloud computing services can provide beneficial information to users, enhancing their time and cost savings, while offering the ability to support users more efficiently. Thus, users will adopt SaaS cloud computing services if they believe that SaaS cloud computing services will benefit them in their ability to obtain their desired performance. Thus, the following hypotheses are proposed:

H3a: Perceived convenience positively affects perceived usefulness of SaaS cloud computing services.

H3b: Perceived convenience positively affects perceived ease of use with SaaS cloud computing services.

### 3.4 PERCEIVED CO PERCEIVED USEFULNESS, PERCEIVED EASE OF USE, AND INTENTION TO USE

Lu and Su [29] analyzed users' perceptions and the factors that influence adoption of the technology. Their model predicts that individuals will use a system if they perceive that the useful benefits of the system are greater than the effort required to use it. In keeping with some prior research, usefulness exerts a significantly positive influence on behavioral intention to use. Suki [30] stated that perceived usefulness is a main determinant of usage behavior and intention to use the technology. Users' experience with using the technology to conduct various tasks can invoke a deeper understanding of its characteristics, which can assist the user in forming cognitions about its overall usefulness. Arguably, the user will be more willing to effectively integrate the technology within his or her work environment as well as experiment with the technology in applying it in novel ways in his or her work as the perception regarding usefulness of the technology [31]. However, Rahmath and Hema [32] defined perceived usefulness as the extent to which a user deems a particular system to enhance his or her job performance. Perceived ease of use is the perception of the degree of effort the user needs to use the system or service. The system use is directly determined by behavioral intention to use, which is in turn influenced by user's attitude toward using the system. Chi et al. [33] indicates that intention to use is an instrument in measuring the strength of a user's willingness to use an innovative technology. Thus, the following hypotheses are proposed:

H4: Perceived ease of use positively affects perceived usefulness of SaaS cloud computing services.

H5: Perceived usefulness positively affects intention to use SaaS cloud computing services.

H6: Perceived ease of use positively affects intention to use SaaS cloud computing services.

## 4 METHOD

### 4.1 MEASURES

The extension study reviews the literature to gather pertinent or established research in building up a well-tested framework and validated scales for the measures of constructs. A detailed methodological framework then developed to provide a sound theoretical basis to guide the process of analysis and synthesis. A self-administered questionnaire is used as a quantitative evaluation method for data collection. Each construct is measured with multiple items that are adapted from previous studies on a five-point Likert scale in the questionnaire, ranging from "strongly disagree" to "strongly agree" (a translation to local language is provided). The operational definitions of each construct are described below in Table 1.

***Table 1. The operational definitions for each construct and resources***

| Construct | Operational definition | Resources |
|---|---|---|
| **Perceived cost** | Perceived cost is defined as a user belief of the cost concerning the SaaS cloud computing usage. | [22] [34] |
| **Perceived security and privacy** | Perceived security and privacy is defined as users' perception of protection against security threats and control of their personal data information during use of SaaS cloud computing service. | [25] [24] |
| **Perceived convenience** | Perceived convenience is defined as a level of convenience toward time, place and execution that users perceive when performing SaaS cloud computing services. | [26] [27] [28] |
| **Perceived ease of use** | The degree to which users believes that a SaaS cloud computing services would be free of effort. | [13] [35] |
| **Perceived usefulness** | The degree to which users believe that the perceived value of SaaS cloud computing services can increase their usefulness to meet the specific needs of individuals. | [13] [32] |
| **Intention to use** | Intention to use is the degree to which users are inclined to use applications or services offered in SaaS computing services. | [36] [37] |

### 4.2 SAMPLE AND DATA COLLECTION

In this study, surveys will be conducted to obtain information that is needed to support the accomplishment of audit objectives. Pre-tests will be carried out to verify the reliability and validity of a self-administered questionnaire in order to amend the results. Pre-test questionnaires for 50 professional participants including subject matter experts, IT professionals, and business decision makers who are involved in the adoption of cloud computing technology and related services will be administered. The final version of the questionnaire will be employed to examine the perception of employees, decision makers, or business managers at Taiwan's enterprise companies in manufacturing and service sectors to better understand cloud computing adoption and implementation.

### 4.3 DATA ANALYSES

After the pilot testing of the revised questionnaire, the Statistical Products, Services and Solutions (SPSS) 20.0 will be used to perform descriptive analysis. This study uses the Statistical Products, Services and Solutions (SPSS) to perform descriptive analysis and the partial least squares (PLS) analytical tool to examine the test the hypotheses of this study by using SmartPLS 3.0. Since cloud computing services is still new and in its infancy in Taiwan, sample size may be one of the major limitations in this study; therefore, PLS is proven to be a suitable method to increase the reliability of this study. Numerous researchers indicate that sample size should be at least 200 for adequate analysis [38]. In this study, a total of 207 usable responses were collected. Table 2 illustrates the demographic characteristics of the respondents. It indicated that the sample had 52.7% of males and 47.3% of female; with the majority of respondents had undergraduate degree. Over 41.5% of respondents were between the ages of 35 and 44, and 30.0% of respondents had work experience between 6-10 years.

*Table 2. Factor Loadings, Cronbach's Alpha, Composite Reliability and AVE*

| Demographic Characteristics | | Frequency | Percent (%) |
|---|---|---|---|
| **Gender** | Male | 109 | 52.7% |
| | Female | 98 | 47.3% |
| **Age** | Under 25 | 26 | 12.6% |
| | 25~34 | 47 | 22.7% |
| | 35~44 | 86 | 41.5% |
| | 45~54 | 32 | 15.5% |
| | 55~64 | 16 | 7.7% |
| **Occupation** | General Manager | 51 | 24.6% |
| | Computer Engineer | 74 | 35.7% |
| | sales representative | 33 | 16.0% |
| | market analyst | 18 | 8.7% |
| | technician | 25 | 12.1% |
| | Other | 6 | 2.9% |
| **Work Experience** | 1~5 years | 29 | 14.0% |
| | 6~10 years | 62 | 30.0% |
| | 11~15 years | 36 | 17.4% |
| | 16~20 years | 33 | 15.9% |
| | 21 and Over | 47 | 22.7% |
| **Education** | Undergraduate | 94 | 45.4% |
| | Master degree | 81 | 39.1% |
| | Doctorate degree | 18 | 8.7% |
| | Other | 14 | 6.8% |
| **Monthly Income (NT$)** | 25000~29999 | 7 | 3.4% |
| | 30000~39999 | 16 | 7.7% |
| | 40000~49999 | 47 | 22.7% |
| | 50000~59999 | 32 | 15.5% |
| | 60000~69999 | 34 | 16.4% |
| | 70000~79999 | 28 | 13.5% |
| | 80000~89999 | 26 | 12.6% |
| | 90000 and Over | 17 | 8.2% |

The measurement model provides a confirmatory assessment of convergent validity and discriminant validity. In this study, convergent validity is assessed by factor loading and composite reliability measures and the individual item ladings is all higher than 0.5, composite reliability is greater than 0.7, and average variance extracted (AVE) exceeds 0.5 as suggested by Hair et al. [39]. For assessing the reliability of measurement, item-scale correlations are used to test the construct validity of the items with loading greater than 0.5 and Cronbach's coefficient alpha are all higher than 0.8 (See table 3).

*Table 3. Factor Loadings, Cronbach's Alpha, Composite Reliability and AVE*

| Constructs | Items | Loadings | Cronbach's alpha | Composite Reliability | AVE |
|---|---|---|---|---|---|
| **Perceived cost** | PC1<br>PC2<br>PC3<br>PC4 | 0.9042<br>0.8644<br>0.8748<br>0.8511 | 0.8980 | 0.9281 | 0.7635 |
| **Perceived security and privacy** | PSP1<br>PSP2<br>PSP3<br>PSP4<br>PSP5 | 0.7694<br>0.7862<br>0.9327<br>0.7568<br>0.8597 | 0.8823 | 0.9129 | 0.6784 |
| **Perceived convenience** | PV1<br>PV2<br>PV3<br>PV4<br>PV5<br>PV6 | 0.9334 0.9037<br>0.9018<br>0.9021<br>0.8665<br>0.8040 | 0.9454 | 0.9563 | 0.7854 |
| **Perceived ease of use** | PEU1<br>PEU2<br>PEU3<br>PEU4<br>PEU5 | 0.8010<br>0.8353<br>0.9084<br>0.8232<br>0.9038 | 0.9077 | 0.9315 | 0.7318 |
| **Perceived usefulness** | PU1<br>PU2<br>PU3<br>PU4<br>PU5<br>PU6 | 0.8033<br>0.8205<br>0.7968<br>0.8275<br>0.8044<br>0.8618 | 0.9019 | 0.9245 | 0.6712 |
| **Intention to use** | IU1<br>IU2<br>IU3<br>IU4 | 0.8765<br>0.8711<br>0.8660<br>0.8817 | 0.8968 | 0.9282 | 0.7636 |

In table 4, results indicated that the squared root of the AVE value of each construct is greater than the correlation between that construct and all other constructs. Overall, the measurement model had adequate reliability and convergent validity.

*Table 4. Square root of AVE and correlations of all constructs*

| Factor | PC | PSP | PV | PEU | PU | IU |
|---|---|---|---|---|---|---|
| **Perceived cost (PC)** | 0.87[a] | | | | | |
| **Perceived security and privacy (PSP)** | 0.2816 | 0.82[a] | | | | |
| **Perceived convenience (PV)** | 0.2328 | 0.7006 | 0.89[a] | | | |
| **Perceived ease of use (PEU)** | -0.1525 | 0.5717 | 0.5116 | 0.86[a] | | |
| **Perceived usefulness (PU)** | -0.2142 | 0.4999 | 0.4586 | 0.5897 | 0.82[a] | |
| **Intention to use (IU)** | -0.1528 | 0.4290 | 0.3454 | 0.5966 | 0.7358 | 0.87[a] |

The results of the path coefficients Beta (β), path significances, and R2 values for the model are illustrated in Figure 3 by using the bootstrap re-sampling method to examine the stability of the PLS. The estimated model explained variance of 68% for perceived usefulness, 61% of the variance in perceived ease of use, and 35% for intention to use. The results indicated three identified factors were significantly associated with perceived usefulness and perceived ease of use, which significantly affected users' intention to use SaaS.

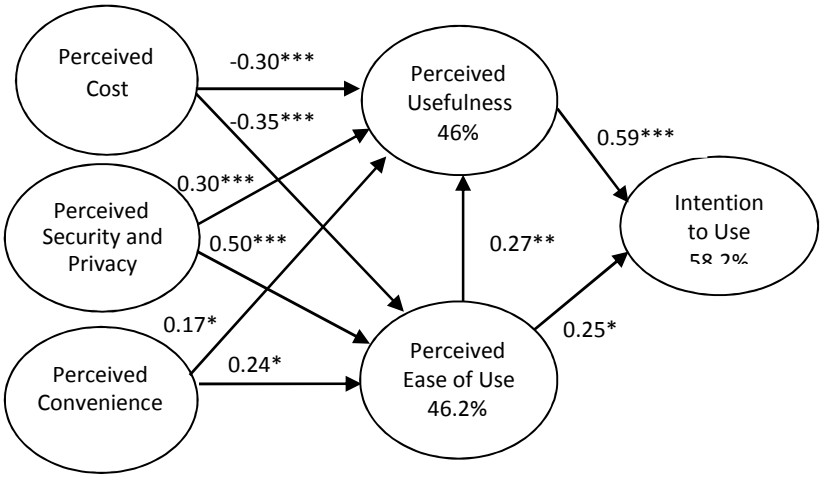


***Fig. 3. The result of PLS***

Table 5 illustrated the path coefficients for each hypothesized path and the corresponding t-values. For hypothesis 1a and 1b, the result shows that perceived cost negatively affects perceived usefulness of SaaS cloud computing services (Path coefficient of -0.30, p<0.001). Perceived cost negatively affects perceived ease of use with SaaS cloud computing services (Path coefficient of -0.35, p<0.001). For hypothesis 2a and hypothesis 2b, perceived security and privacy positively affects perceived usefulness of SaaS cloud computing services (Path coefficient of 0.30, p<0.001). Perceived security and privacy positively affects perceived ease of use with SaaS cloud computing services (Path coefficient of 0.50, p<0.001). For hypothesis 3a and hypothesis 3b, the results showed that perceived convenience positively affects perceived usefulness of SaaS cloud computing services (Path coefficient of 0.17, p<0.05). Perceived convenience positively affects perceived ease of use with SaaS cloud computing services (Path coefficient of 0.24, p<0.05). Results for hypothesis 4 showed that perceived ease of use positively affects perceived usefulness of SaaS cloud computing services (Path coefficient of 0.27, p<0.01). For H5 and H6, perceived usefulness positively affects intention to use SaaS cloud computing services (Path coefficient of 0.59, p<0.001). Perceived ease of use positively affects intention to use SaaS cloud computing services (Path coefficient of 0.25, p<0.05). As expected, the results of findings showed all hypotheses were fully supported and lend support to the validity of the proposed research model.

***Table 5. Results of Hypotheses Testing***

| | **Path Coefficient** | **t-value** |
|---|---|---|
| **Perceived cost →Perceived Usefulness** | -0.30 | 3.9216*** |
| **Perceived cost →Perceived Ease of Use** | -0.35 | 5.4419*** |
| **Perceived Security and Privacy →Perceived Usefulness** | 0.35 | 3.6867*** |
| **Perceived Security and Privacy → Perceived Ease of Use** | 0.50 | 3.6401*** |
| **Perceived Convenience→ Perceived Usefulness** | 0.17 | 2.2024* |
| **Perceived Convenience→ Perceived Ease of Use** | 0.24 | 2.0458* |
| **Perceived Ease of Use → Perceived Usefulness** | 0.27 | 2.5877** |
| **Perceived Usefulness → Intention to Use** | 0.59 | 5.8429*** |
| **Perceived Ease of Use → Intention to Use** | 0.25 | 2.0796* |

## 5 CONCLUSION

This study identified the factors encompassing SaaS cloud computing services that influence the user intention. The results of this study showed that perceived cost negatively affects perceived usefulness and perceived ease of use with SaaS cloud computing services. Perceived security and privacy positively affects perceived usefulness and perceived ease of use with SaaS cloud computing services. Perceived convenience positively affects perceived usefulness and perceived ease of use with SaaS cloud computing services. Perceived ease of use positively affects perceived usefulness of SaaS cloud computing services. Perceived usefulness positively affects intention to use SaaS cloud computing services. In addition, perceived ease of use positively affects intention to use SaaS cloud computing services. The results of this study intend to provide a nascent

understanding of how effectively and efficiently cloud computing services delivers ubiquitous value to firms. The survey of SaaS cloud computing services is to provide a dependable source and practical guidelines for the firm's decision makers to benefit long-term business model development. The relevant results are useful for the reference data sources to identify needs for further research. The study summarized the critical, relevant literature to provide preliminary findings with valuable information and relevant results that are useful reference data sources for readers.

However, the possibility of limitations may be encountered in the research process. The sample data used for this study distributed to the customers of businesses in Taiwan. As is apparent, the use of SaaS cloud computing has just started and is still in its infancy stage; therefore, the small sample size is not a large enough sample size to be generalizable to the population. In addition, random sampling is not guaranteed to produce a sample representative of the sampling frame. Thus, the study sample may not be representative of the sampling frame or target population. In the future, the survey may focus on finding an appropriate sample and including more participants to increase the generalizability of the research while random sampling is a vital part of ensuring the generalizability of the survey results due to the particulars of a population, restrictive eligibility criteria or poor participation. Data collection is an elementary step in survey research that can also be costly and time consuming. To solve these problems, online surveys and questionnaires offer considerable advantages over traditional methods; they are fast and easy and are becoming a popular method of data collection. Since online surveys are less time consuming and more cost effective and can help improve the effectiveness of the research method, the research could leverage existing social networks to obtain necessary free information in order to reduce costs to overcome these limitations.

## ACKNOWLEDGMENT

The author would like to thank the editor and anonymous reviewers for their valuable comments and suggestions to improve the quality of the manuscript.

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