Journal of International Technology and Information Management

Volume 26 | Issue 3 Article 6

10-1-2017

Understanding the determinants affecting the continuance intention to use cloud computing

Shailja Tripathi Dr.
IFHE University, IBS Hyderabad, shailja.tripathi@gmail.com

Understanding the Determinants Affecting the Continuance Intention to Use Cloud Computing

Dr. Shailja Tripathi
Department of Information Technology and Operations,
IFHE University
IBS Hyderabad, Telangana, India
Shailja.tripathi@ibsindia.org

ABSTRACT

The purpose of the paper is to understand the fundamental factors influencing the senior manager's continuance intention to use cloud computing in organizations. A conceptual framework was developed by using the Technology Acceptance Model (TAM) as a base theoretical model. A questionnaire was used to collect the data from several companies in IT, manufacturing, finance, pharmaceutical and retail sectors in India. The data analysis was done using structural equation modeling technique. Perceived usefulness and perceived ubiquity are identified as important factors that affect continuance intention to use cloud computing. In addition, perceived ease of use is found having indirect influence through perceived usefulness. The validated model can be used as a framework for managers to ensure successful implementation of cloud computing. The study extended TAM by incorporating additional variables like perceived ubiquity, perceived costs and perceived risks to explore the determinants of continued intention to use cloud computing.

Keywords: TAM, Cloud computing, Continuance intention

INTRODUCTION

Employee's low adoption and usage hinder the successful implementation of information technology (IT) in organizations. Cloud computing technology (CCT) is a type of IT model capable of providing computing infrastructure and applications over the internet. It eradicates the need of installing and running software and middleware/applications on users' systems and eases the tasks of software and hardware maintenance and support. Sharif (2010) added that CCT is the current technology being prominent by IT industry and having the potential to change the operation and usage of internet and information systems. It assures to renovate usual delivery of IT with ubiquitous access, reduction of costs, and higher elasticity (Hsu et al., 2014). Mell & Grance (2011) believed that CCT is a model that permits ubiquitous and expedient delivery of a group of organized hardware and software services including network, server and storage on demand. According to National Institute of Standards and Technology (NIST), CCT implements computing jobs in an elastic and multitenant environment, where jobs/tasks may vigorously vary depending on demand of IT resources with minimum service provider interaction or management effort.IBM stated that a CCT is a pool of virtualized computer resources and can host various workloads such as batch-style backend jobs and interactive and user-facing applications.

Mell & Grance (2011) pointed out five essential characteristics of CCT. On demand self-service deals with independent supply of IT resources without user interface with the provider; broad network access represents the delivery of IT resources through the internet; measured service is the regular control and fulfillment of resource requests in an optimal way through pay per use method; resource pooling is the assembling of IT resources to supply to the several consumers; and the last and fifth one, rapid elasticity describes a vigorous scaling up and down of resources with demand. CCT itself extends its service in three different forms - Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). SaaS is a revival of ASP as on-demand computing, wherein software applications are kept on a server for hosting over internet for end user usage without installing and upgrading software on the client's machine. It is the most established and leading cloud model. PaaS model offers platforms for operating systems, database storage, middleware and software development and tools. In IaaS, infrastructure like hardware, software and devices for storage and network can be accessed with proper authentication. In addition, CCT can be implemented in four different ways - public, private, hybrid and community cloud. Public cloud is provided by a service provider and it is cost effective for small and medium sized businesses (SMBs) to deploy IT solutions.

Large organizations can manage their own private cloud in their premises. A certain group of enterprises with common interests can use and control a community cloud. Hybrid cloud is a blend of public and private clouds.

Ercan (2010) highlighted CCT as being adopted by various organizations due to its dynamic capability and as a service it offers usage of virtualized resources through the internet. Several companies put forward their innovative cloud computing solutions. A set of web-based tools provided by Microsoft cloud solutions such as Microsoft Office 365 and Microsoft Dynamics CRM Online that can be used by small businesses, independent consultants and professionals. Windows Azure provides a highly flexible and scalable public cloud. IBM comes out with the extension of cloud computing services called as IBM SmartCloud Solutions that have a broader range for private, public or hybrid cloud computing by providing a range of online services for social business, such as social networking and collaboration, delivered through the SaaS model. VMware provides the customers, a set of resources to compute, storage and network as a vCloud Hybrid service that offers dedicated Cloud and virtual Private Cloud. Amazon Web Services (AWS) provides infrastructure with high reliability, scalability and cost effectiveness to help numerous businesses around the world. Rackspace provides an enterprise level hosting services to all sizes of businesses in the world. Salesforce.com is an on-demand supply of CRM applications on a subscription basis.

Regardless of several uses and promises of CCT, there are several barricades to adopt it. Security is a very important challenge of cloud computing, because protecting sensitive information on a public cloud remains a vital problem. The need of steady and speedy internet connectivity is another noteworthy barrier for CCT (Lin & Chen, 2012). Poor standardization of application program interfaces (APIs) and platform technologies may not allow the firms to easily switch over to other cloud services. Lack of interoperability can discourage firms to adopt CCT (Armbrust et al., 2010). Khajeh-Hosseini et al. (2012) highlighted the five categories of risks in using cloud computing -policy and organizational, technical, legal, network, and project and business risks.

The technology cannot improve organizational performance if it is not properly used. The common problem includes employees' resistance to adapt to cloud computing service environment. If they come out of that negative inertia, they can see a different world of getting the required software, application platforms and infrastructure virtually. After implementation of CCT, it would be helpful for organizations to evaluate its benefits and overall performance. There is a requirement of identification and evaluation of factors that contribute to intention and continuation to use cloud computing in organizations. This study, therefore

intends to understand the elementary factors that influence the manager's continuance intention to use cloud computing. It focuses on extending Technology Acceptance Model (TAM) and examining data collected from the senior managers who have experience in using cloud computing.

THEORETICAL BACKGROUND

Technology adoption refers to the extent to which a technology is preferred for use by an individual or an organization. Davis and Olson (1985) described IT adoption as usage of hardware and software applications for management, operations and decision making process in the firm. Hence, in a business environment, any technology adoption can be treated as usage of the tools and techniques relevant to that technology to support operations, management and decision-making. Several theories as well as models have evolved to explain the intention to adopt different technologies. They include the technology acceptance model (TAM), theory of reasoned action (TRA), technology-organization-environment (TOE) model, Resource Based View (RBV) theory and diffusion of innovation (DOI) model. TOE, DOI and RBV address the issues related to adoption of technology at organization level. On the other hand, the models TAM and TRA deal with issue related to adoption at the individual level.

Based on TRA, Davis (1989) proposed TAM by replacing many of the measures of attitude of TRA with the two core measures of acceptance of technology- Perceived ease of use and Perceived usefulness. Perceived usefulness is the degree to which a person believes that using a particular system would enhance his/her job performance, whereas perceived ease of use is the extent to which a person thinks that using a particular system would be free of mental effort. He proposed system use as a response that can be predicted or explained by user motivation, which is directly influenced by an external stimulus consisting of actual system's features and capabilities. TAM is based on the causal relationship among belief, attitude, intention, and behavior within TRA. Several reports exist in literature (Behrend et al, 2011; Wu et al, 2011, Obeidat and Turgay, 2012; Aharony, 2015) that talk about application of TAM to identify various factors that affect the user acceptance of cloud computing in organizations. Perceived usefulness (PU), perceived ease of use (PEOU), perceived advantages and perceived disadvantages, personal innovativeness, self-efficacy, openness to experience, computer competence and social media use are the factors extracted from that past research. Behrend et al. (2011) and Wu et al. (2011) carried out their study in the education arena and examined the factors that showed the way for students to adopt CCT. Opitz et al (2012) and Alharbi (2012) suggested that for the area of research on CCT, the

respondents should be the IT professionals in the firms. Dachyar et al (2012) reported that the use of CCT depends on the opinions of decision makers in the firms. Obeidat & Turgay (2012) took up their study among mid to top level managers who were either possessing functional IT responsibility or affected by adoption of cloud computing. To investigate the influence on user acceptance of cloud computing, they studied only two factors - perceived advantages and perceived disadvantages. Aharony (2015) carried out their study among librarians and information specialists. He analyzed that behavioral intention to use CCT was impacted by several of the TAM variables (PEOU, personal innovativeness), personal characteristics and computer competence. All the above studies focused mainly on cognitive factors and personal traits that impact user acceptance of cloud computing.

The base TAM model had gone several modifications to be applicable to the contexts of adoption of different technologies. As one of the extensions of TAM, TAM2 was proposed by Venkatesh & Davis (2000). They identified additional variables that could be antecedents to perceived usefulness in TAM and further included more theoretical constructs spanning social influence processes (subjective norm, voluntariness and image) and cognitive influence processes (job relevance, output quality, result demonstrability and perceived ease of use). Venkatesh (2000) proposed another important extension of TAM, in which he incorporated two main groups of antecedents for perceived ease of use - anchors (computer self-efficacy, perception of external control, computer anxiety and computer playfulness) and adjustments (perceived enjoyment and objective usability). Venkatesh & Bala (2008) proposed another important extension of TAM, which is referred to as TAM3, as an integrated model of determinants of perceived usefulness and perceived ease of use. They empirically validated the model and used the integrated modelas a facilitator to propose future directions for research on interventions. By using TAM, Lal&Bharadwaj (2016) examined the factors that influence the CCT adoption and its impact on the organizational flexibility in the perspective of IT executives. It was interpreted that success of a new technology depends on its acceptance by organizations in different industries. Their results indicated that CCT provides relative advantage in terms of scalability, accessibility, and deployment of service on demand. By applying TAM, Arpaci (2017) investigated the precursors and outcomes of CCT adoption in education to attain knowledge management (KM). This study analyzed the causal relationship between the expectations for KM practices and the perceived usefulness of cloud computing services and the causal relationships among innovativeness, training and education, and PEOU. The results showed that the perceived usefulness is significantly related to the expectations for KM practices –creation and discovery, storage, and sharing of knowledge. It was found that the expectations for knowledge

storage and sharing had a stronger relationship with the perceived usefulness than other KM practices. It was also found that innovativeness and training and education were significantly related to the ease of use perceptions.

Wu (2011) developed an explorative model to examine the important factors influencing the adoption of SaaS. Grounded on the TAM-diffusion theory model, they ran the model with a total of eight constructs- Media Influence (MI), Social Influence (SI), Security and Trust (S&T) Perceived Benefits (PB), Attitude toward Technology Innovations (ATI), PU, PEOU, and behavioral intension (BI). They used PLS path modeling to test the hypotheses and their results indicated that PU and PEOU are two key factors of BI. Their results also developed insights into SaaS adoption for improving both new product development and marketing strategy. Behrend et al (2011) analyzed the factors that influence CCT adoption in urban and rural community colleges of higher education by analyzing a series of factors and outcomes. They developed a path analytic model based on TAM 3 to examine both actual usage and future intentions of students in using Virtual Computing Lab. They found the influence of ability of students to travel to campus on perceived usefulness and also the influence of direct experiences with the platform and instructor support on ease of use. Wu et al (2013) used the duo-theme decision making trial and evaluation laboratory (DEMATEL) with TAM in developing an evaluation framework and analyzing the root causes that hinder the internal CCT acceptance in a Taiwan university. Obeidat & Turgay (2013) applied the Social Exchange Theory into TAM to formulate and validate a unified theory called Technology Trade Theory (Triple-T) model that can be used to assess CCT adoption. Aharony (2015) made an exploratory study using TAM to examine the factors that may influence information professionals, namely librarians and information specialists in making decision to adopt CCT in their organizations. Using in-depth interview approach, they collected data on personal details, computer competence, attitudes to cloud computing, behavioral intention, openness to experience, cognitive appraisal and self-efficacy. Personal characteristics were found as the major factors which influence behavioral intention to use CCT. He interpreted that high scores in PEOU and personal innovativeness were due to high scores in adoption intention of CCT. Sharma et al. (2016) extended TAM by incorporating three external variables of computer self-efficacy, trust, and job opportunity to determine the factors that influence CCT adoption by IT professionals. They found that computer self-efficacy, perceived usefulness, trust, perceived ease of use, and job opportunity are the best predictors of CCT adoption.

Application of TAM framework for post-adoption

Adoption represents commitment or continued usage of the technology over time. The ultimate success of an information system (IS) depends on its continued use rather than first-time use (Bhattacherjee 2001; Limayem et al. 2007). Continuance intention is a behavioral pattern reflecting continued use of a particular IS or its post adoption behavior (Limayem et al. 2007).TAM was initially developed to predict initial adoption of a new ITafter a very short interaction with a system. It is also used to explain and predict future user behavior. This pre-adoption situation was prevalent in the works of Davis et al. (1989)on wordprocessor, Szajna(1996)on e-mail system, Venkatesh and Davis's (1996)on graphics systems, Venkatesh (1999) on virtual workplace system, Venkatesh and Davis(2000) on a proprietary IS, and Venkatesh and Morris(2000) on a data retrieval system, where TAM was used to predict the behavioral intention of user in the future.TAM was applied to examine adoption intentions of the user after IT was already adopted and was in use(Karahanna et al., 1999; Taylor & Todd, 1995). TAM was extended further and used in post-adoption situations by Bhattacherjee (2001). Taylor and Todd (1995) examined usage intentions of a computing service facility by the students that had already been widely used by many of them. Davis (1989) studied adoption of an e-mail system and a text editor by the IBM employees that were already in use in the organization at the time of study. Lederer et al. (2000) studied the active newsgroup users with the TAM framework. Similarly, Konana and Balasubramanian (2005) applied TAM to investigate the online investing adoption based on interviews and a survey of experienced online investors. According to Hong et al. (2006), in the situations where the users had been using the technology for an extended period, these studies in reality examined experienced users' continuance intention to use the technology, not the behavioral intention to use or adopt it by the inexperienced users. Therefore, the research model of this study deals with continuance intention to use cloud computing in organizations. The model focuses on extension of TAM, where core variables like perceived usefulness and perceived ease of use are integrated with perceived ubiquity, perceived costs and perceived risks to test the influence of these factors on continuance intention to use CCT in organizations. Table 1 gives an overview of the literature reports wherein base TAM was applied to examine the post-adoption of IT along with the systems targeted, usage experience and respondents.

Table 1. Examples of TAM application to examine post-adoption behavior of experienced users

Study	Target system	Respondents	Degree of usage experience
Adams et al. (1992)	Email and Voice mail systems	Students and users from organizations	28 months
Taylor and Todd (1995)	Computing resource center (CRC)	Business school students	Mixed: over 60% of participants had prior experience using the CRC
Igbaria et al. (1996)	Micro-computer	Managers/professionals	At least 6 months
Gefen and Straub (1997)	Email systems	Knowledge workers	Many years
Lederer et al. (2000)	Internet websites	Current newsgroup users	At least 6 months
Hong et al. (2001)	Digital libraries	Students	2/3 of the respondents were current users
Hu et al. (1999); Chau and Hu (2001)	Telemedicine technology	Physicians in public hospitals	Mixed: non-experienced and current users
Gefen et al. (2003)	Online shopping	Students	Average of 7.18 times
Yang and Yoo (2004)	Spreadsheets	Students	6 months
Konanaand Balasubramanian (2005)	Online investing	Individual investors	Mixed: current online investors as well as traditional investors

HYPOTHESES AND RESEARCH MODEL

This study is intended to examine the factors that influence the continuance intention to use cloud computing in organizations, by applying the extended TAM approach. In addition to the two major factors of TAM (perceived usefulness and perceived ease of use), this study included some additional factors, such as,

perceived ubiquity, perceived costs and perceived risks. While developing hypotheses and a theoretical research model to test, all these variables have been considered as separate constructs that take part in the model. Exploratory factor analysis is used to establish unidimensionality of the model and structural equation modeling (SEM) is used to validate the constructs and their convergence in the measurement model and also to test the hypotheses and validate the model. SPSS 20.0 and AMOS 20.0 software is used to do all these analyses.

Perceived usefulness of CCT is the extent to which a person believes in its use to perform a task and enhance performance. It is an important indicator because when users are willing to adopt cloud computing they believe that using cloud services can improve their business efficiency, performance and productivity (Senk, 2013). Davis et al. (1989) and Venkatesh and Davis (2000) used usefulness, efficiency, productivity, effectiveness and performance as items to measure perceived usefulness. Based on the above reports, the current study considered the same five items as measures for perceived usefulness in the case of cloud computing. Perceived usefulness is the degree to which a person believes that using IT will be free of effort (Davis, 1989). The items used by Davis *et al*. (1989) and Venkatesh & Davis (2000) to measure perceived ease of use included simple to use, clear and understandable, flexible to interact, require less mental effort, become skillful at using and Ease of learning to operate. The same six items have been adopted in the present study. Davis et al (1989) found a direct effect of perceived usefulness on adoption intention and also both a direct and indirect effect of perceived ease of use on intention through perceived usefulness. In view of the above, the following two hypotheses have been proposed to represent the influences of perceived usefulness and perceived ease of use on continuance intention to use CCT.

H1. Perceived usefulness positively influences continuance intention to use cloud computing.

H2. Perceived ease of use positively influences continuance intention to use cloud computing.

According to Davis (1989), perceived ease of use has a significant direct influence on perceived usefulness. When there are two systems performing the same set of functions, the user should opt the system that is easier to operate and more useful. Therefore, it can be hypothesized that perceived ease of use has a positive influence on perceived usefulness in the case of CCT adoption also.

H3. Perceived ease of use positively influences perceived usefulness.

Perceived Ubiquity is an individual's perception on the extent to which a technology provides personalized and constant connection and interactions among individuals and/or networks (Kim & Garrison, 2009). Ubiquity enables users to reach and access networks from anywhere at any time. In the case of mobile wireless technology acceptance, the three items used by Kim & Garrison (2009) to measure perceived ubiquity included providing communication and network accessibility, anytime-and-anywhere communication and connectivity, using technology for personal and business purposes. This study also adopted the same three items under the construct of perceived ubiquity in assessing CCT post adoption behavior. The availability and access of cloud computing should be possible anywhere and anytime and this particular characteristic represents the omnipresence of cloud computing. Therefore, it is hypothesized that perceived ubiquity has a positive influence on continuance intention to use cloud computing.

H4. Perceived ubiquity positively influences continuance intention to use cloud computing.

Perceived risks refer to business concerns of a firm after adopting a technology. In the case of cloud computing, they may appear in the form of data lock-in, confidentiality, insufficient service quality guarantee, bandwidth bottlenecks, and reliability (Armbrust et al., 2010; Hsu et al., 2014). Hsu et al. (2014) used seven items to measure perceived risks. These items are confidentiality, incompatibility, insufficient service quality guarantee, internet bottleneck, service outages, underperformance, and vendor lock-in. Based on the above reports, this study adopted the same three items under perceived risks in the case of CCT. Public clouds raise data ownership and intellectual property (IP) right issues because data may be stored offshore in multiple locations and/or shifted from one location to another without the knowledge of the client. (Ross & Blumenstein, 2013). Because of that cloud raises several concerns about security and privacy in storing data. Therefore perceived risks may have a negative effect on continuance intention to use cloud computing.

H5. Perceived risks negatively influence continuance intention to use cloud computing.

Perceived cost is an individual's perception of cost. It is the level of belief of an individual about the cost of using a particular technology (Phonthanukitithaworn et al., 2015). Costs related to set-up, training and running of software and hardware involved and maintenance cost are used as items to measure perceived costs (Kuan & Chau, 2001 and Premkumar & Roberts, 1999). The current study also adopted

the same items under perceived costs in the context of cloud computing. Hence, costs will be a deciding factor for continuance intention to use cloud computing and therefore, it is hypothesized that there is an influence of perceived costs on continuance intention to use cloud computing.

H6. Perceived costs influence continuance intention to use cloud computing.

Based on the six hypotheses developed, a theoretical research model has been developed for examination, as shown in Figure 1.

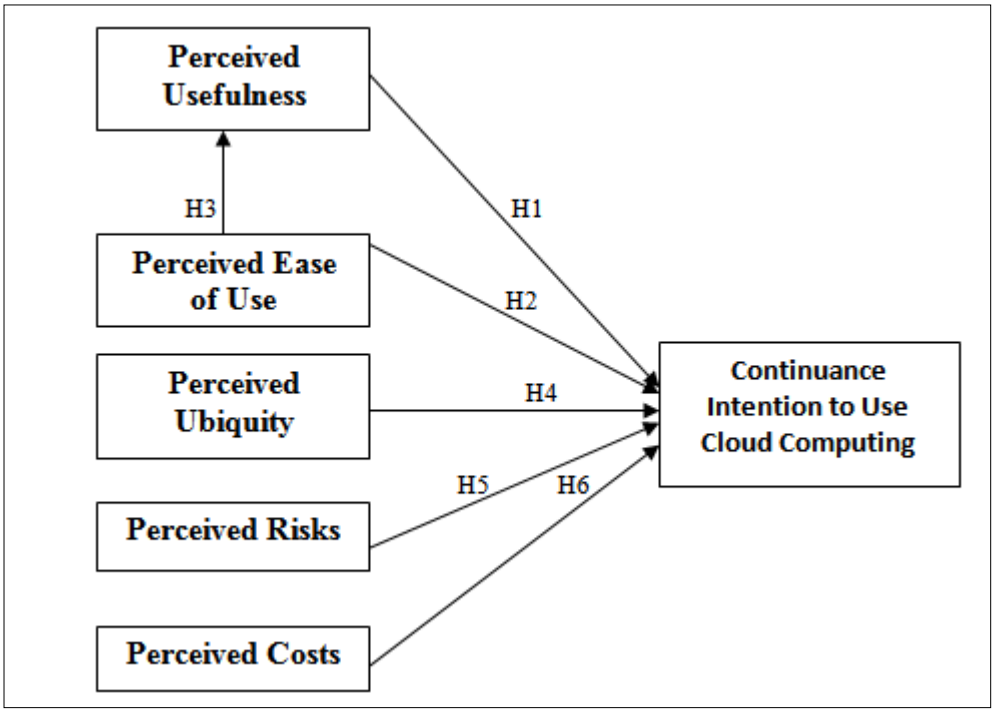

Figure 1. Conceptual framework

METHODOLOGY

To examine the proposed hypotheses and the research model, this study needs to collect and analyze relevant data. The survey instrument is developed with the help of validated questionnaires that were already used in previous studies, as shown in Table 2. The study targeted senior managers of firms as unit of analysis, who are responsible for making IT decisions in the organizations and have at least two years of experience in using cloud computing. The unit of analysis is the main entity that is being examined in a study. The firms are adopters of cloud computing. The

respondents are selected from the database of a project consultancy company, NIIR (National Institute of Industrial Research), which consists of 2881 small and medium sized enterprises (SMEs) and large firms of India who have already adopted cloud computing. These firms belong to the sectors of IT, service, manufacturing, finance and telecommunication. The selection of these industries is in accordance with the CIO report (2010) that these industries have high cloud computing adoption rate. The locations of the companies are Hyderabad, Bangalore, Mumbai, Chennai and Delhi. Simple random sampling was performed to select the respondents from the sampling frame.

Table 2. The sample measures

Sources	**Items**
Perceived Usefulness (PU) Davis *et al*., 1989; Venkatesh and Davis, 2000	PU1: I would find cloud computing useful.
	PU2: Using cloud computing would increase my efficiency.
	PU3: Using cloud computing increases my productivity.
	PU4: If I use cloud computing, I would accomplish my tasks more quickly.
	PU5: I would find cloud computing effective for my tasks.
Perceived Ease of Use (PEOU) Davis *et al*., 1989; Venkatesh and Davis, 2000	PEOU1: Learning to operate cloud computing would be easy for me.
	PEOU2: Using cloud computing would require less mental effort.
	PEOU3: My interaction with cloud computing would be clear and understandable.
	PEOU4: I would find cloud computing services flexible to interact with.
	PEOU5: It would be easy for me to become skillful at using cloud computing services.
	PEOU6: In general, It is simple to use cloud computing.
Perceived Ubiquity (PUB) Kim & Garrison, 2009	PUB1: In my job, cloud computing providing communication and network accessibility "anytime-and-anywhere" is very crucial.

	PUB2: In my job, cloud computing provides me anytime-and-anywhere communication and connectivity.
	PUB3: How frequently do you use cloud computing for personal and business purposes?
Perceived Risks (PR) Pei-Fang Hsu, Soumya Ray and Yu-Yu Li-Hsieh, 2014	PR1: Cloud computing leads to customer or confidential information leakage.
	PR2: Cloud computing is difficult to integrate with previous IT systems.
	PR3: Cloud cannot provide solid quality guarantee.
	PR4: Cloud computing has poor network transfer speed.
	PR5: Cloud computing leads to unexpected service outages.
	PR6: Cloud computing leads to underperformance of the software and hardware.
	PR7: Cloud computing restricted to a particular provider, difficult to switch (Data Lock-in).
Perceived Costs (PC) Premkumar, G., & Roberts, M. (1999), Kuan, K. K., &Chau, P. Y. (2001), Lian, J. W., Yen, D. C., & Wang, Y. T. (2014)	PC1: The cost of establishing CCT is high.
	PC2: The cost of maintaining CCT is high.
	PC3: The cost of CCT user training is high.
Continuance Intention (CI) Bhattacherjee (2001)	CI1: I intend to continue using CCT rather than use any alternative technology.
	CI2: My intentions are to continue using CCT rather than use any alternative technology.
	CI3: If I could, I would like to continue my use of CCT.

Mails or telephone calls were made to screen the organizations on the basis of the questions like they are aware of cloud computing and whether their firm has already adopted cloud computing. Out of a total of 2881 organizations, 733 were found to

be eligible for this survey on the basis of screening questions. Most of the responses were collected through personal visits to the respondents and other responses were collected through emails. The survey instrument was distributed to the 733 organizations, and out of them, 425 responses were collected. 418 were found valid. Exploratory factor analysis and structural equation modeling (SEM) have been used for data analysis. Sample characteristics are identified based on their size of firm, type of industry, organizational structure, age and year of adoption of cloud computing. Size of firm is determined by number of employees working in the firm. According to Gangwar et al. (2015), small size firms have employees less than 400, whereas medium sized firms have employees between 400 to 800 and large firms have employees greater than 800. The demographic profile with respect to firm's data is shown in Table 3. Most of the responses (313) were received from large firms with meager (13) response from medium sized firms. More than half of the total responses (242) were received from the IT firms. Most of the responded firms (215) have hierarchical organizational structure. Most of the responses were collected from the firms having adoption ages of 1-2 years, 2-4 years and 4-6 years.

Table 3. Demographic profile with respect to firm's data

Size of firm (Based on number of employees)	**No. of firms**
Small	92
Medium	13
Large	313
Type of industry	**No. of firms**
IT	242
Services	101
Finance	33
Manufacturing	21
Others (Pharma/Telecommunications/Retail)	21
Organizational Structure	**No. of firms**
Hierarchical	215
Simple	146
Others	57
Age of adoption of CCT	**No. of firms**
1-2 years	148
2-4 years	147
4-6 years	110
6-8 years	13

The demographic profile such as age, gender and years of experience of the respondents is shown in Table 4. More than half of the respondents are in the age group of 25-30 years (231), followed by 30-40 years (134). Regarding gender, most of the respondents are male (351); and regarding total experience (total industry experience), most responses were received from the people having 5-10 years (262) of experience, followed by 2-5 years (113) of experience.

Table 4. Demographic profile of the respondents

Age of respondents	**No. of respondents**
25-30 years	231
30-40 years	134
40-50 years	41
>50 years	12
Gender of Respondents	**No. of respondents**
Male	351
Female	67
Total experience of respondents (Industry experience)	**No. of respondents**
2-5 years	113
5-10 years	262
10-15 years	26
>15 years	17

DATA ANALYSIS AND RESULTS

Data was analyzed using exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and structural equation modeling (SEM) using SPSS 20 and AMOS 20 applications.

Reliability and exploratory factor analysis

The reliability of the questionnaire was assessed by Cronbach's alpha (CA) as 0.82. According to Nunnally (1978), CAvalue of 0.6 or higher is required to use an instrument (questionnaire) and hence the derived reliability value is highly acceptable. The Barlett's test of spherecity is significant at 0.000 and KMO value is 0.799 and these results provide high measure of sampling adequacy and ensure

factorability of the data. Further, the scale was factor analyzed using principal component analysis and varimax rotation.

The reliabilities of the sub-scales varied between 0.802 and 0.927, which exceed the recommended value of 0.6. This ensures reliability of the factors and validity of the factor structure. All the variables were grouped in 6 factors and all together accounted for 72.55 percent of the total variance. This value of total variance explained means that the set of factors extracted from the data explain continuance intention to a very high extent and a very less part of the adoption remains unexplained.

Confirmatory factor analysis (CFA)

Under SEM, confirmatory factor analysis (CFA) was performed for the measurement model to establish construct, convergent and discriminant validity and check goodness of model fit to data. From a total of 27 items, four of the items of the variable 'perceived risks' were dropped in the first step of confirmatory factor analysis, because these four items (PR1 to PR4) had very low squared multiple correlation (SMC) values of 0.45, 0.46, 0.46 and 0.32. The other three items (PR5 to PR7) have high SMC values of 0.799, 0.796 and 0.777. In CFA, SMC is the communality estimate for an indicator variable explained by its latent variable and is also interpreted as the reliability of the indicator. Variable having low SMC can be removed for model modification. Maximum likelihood method was employed to develop the measurement model and for confirmatory factor analysis. Validity of the scale was checked through convergent validity and discriminant validity. According to Fornell & Larcker (1981), standardized factor loadings and AVE are used to assess convergent validity. Both standardized factor loadings and AVE should be above 0.5 to ensure convergent validity and the derived values are above 0.5. All the AVE values are in the range between 0.576 and 0.822 and hence the discriminant validity as recommended by Chin (1998) has been met satisfactorily. It can be observed from the result that the square root of variance distributed between a construct and its items is more than the correlations between the constructs and it establishes discriminant validity, as recommended by Fornell & Larcker (1981). Table 5 details the results of inter-construct correlations and descriptive statistics.

The overall goodness of model fit to data is assessed using χ^2 test with χ^2 and degrees of freedom (df) values and also using some indices. For χ^2/df, value less than or equal to 5 ensures an adequate fit between the model proposed in the study and the sample data (Wheaton et al, 1977). In this study, the value of χ^2/df is derived as

1.709 at $p < 0.001$, which can be well accepted. According to Hu & Bentler (1999), the incremental fit indices of NFI, CFI, TLI and IFI must have a value of 0.90 or above for acceptable model fit. In the present study, the derived values of NFI, RFI, IFI, TLI and CFI are 0.926, 0.914, 0.968, 0.962 and 0.968respectively. All these values are above 0.90 and hence indicate an acceptable model fit. The RMSEA value is derived as 0.041, which is in good agreement with the ranges of values reported by Hair et al. (2010) and Byrne (2001), that is, less than 0.05. For reporting model fit indices, as the index of choice, CFI was recommended by Hu & Bentler (1999), and RMSEA was strongly recommended by MacCallum & Austin (2000). According to Ho (2006), the model is fit, if at least three indices meet the criteria. Hair et al. (2010) recommended that the values of χ^2/df or CMIN, CFI, and RMSEA give unique and sufficient information to assess the model. They reported that at least one incremental index, one absolute index and value of $\chi 2$/df should be reported by the researcher. Based on the results derived for $\chi 2$/df, CFI and RMSEA, all of which are falling in the acceptable ranges, it can be interpreted that goodness of model fit has been established.

Table 5. Inter-construct correlations and descriptive statistics

	Inter-construct correlations						Descriptive statistics	
Constructs	**Perceived Usefulness**	**Perceived Ease of Use**	**Perceived Ubiquity**	**Perceived Risks**	**Perceived Costs**	**Continuance Intention**	**Mean**	**Standard deviation**
Perceived Usefulness	**0.718**						3.75	1.19
Perceived Ease of Use	0.016	**0.607**					2.79	1.19
Perceived Ubiquity	0.051	0.003	**0.607**				3.11	1.03
Perceived Risks	0.288	0.019	0.061	**0.822**			3.55	1.28

Perceived Costs	0.011	0.004	0.005	0.021	**0.577**		3.15	1.33
Continuance Intention	0.04	0.001	0.051	0.006	0.010	**0.576**	3.05	1.11

Path analysis

To test the proposed hypotheses, the measurement model was converted to structural model using AMOS, as shown in Figure 2. Using regression weight table, the results are interpreted in Table 6. The β coefficient of the path from 'Perceived Usefulness' to 'Continuance Intention' is 0.050 (p-value < 0.001), which is positively significant, and thus supports hypothesis H1. This finding is concurring with the result of Davis et al (1989) that perceived usefulness strongly influences user's intentions. The path coefficient (β) of 'Perceived Ease of Use' to 'Continuance Intention' is 0.045 (p-value = 0.104), hence that path is not found significant at 0.05 level, and hypothesis H2 is not supported. The β coefficient of the path from 'Perceived Ease of Use' to 'Perceived Usefulness' is 0.048, which is positively significant (p-value < 0.05), and thus supports hypothesis H3. This result is concurrent with the findings of Davis (1989) that perceived ease of use directly influences perceived usefulness meaning that the system is more useful if it is easy to use. The β value of the path from 'Perceived Ubiquity' to 'Continuance Intention' is derived as 0.059, which is highly and positively significant at p-value of 0.001 and hence the hypothesis H4 is supported. This result is well agreeing with the findings of Park & Ryoo (2013) that omnipresence or ubiquity affects end-users' intention to use CCT. The coefficient of the path from 'Perceived Risks' to 'Continuance Intention' is derived as 0.043with p-value of 0.208, which is not significant at p-value < 0.001 and hence it does not support the hypothesis H5. For the path from 'Perceived Costs' to 'Continuance Intention', the β coefficient is derived as 0.049, which is not significant with p-value of 0.079 which is greater than 0.05. Therefore, hypothesis H6 is not supported. This result does not support the findings of Lian et al. (2014) that perceived costs have a significant effect on CCT adoption in organizations.

The path analysis is also done for large firms (313) only. The result was almost same. The result was different in the case of relationship between perceived ease of use and perceived usefulness that is not found significant, hence hypothesis H3 is not supported in this case. The findings show that perceived ease of use, perceived

costs and perceived risks do not influence continuance intention to use CCT whereas perceived usefulness and perceived ubiquity are found significant in influencing continuance intention to use CCT.

DISCUSSIONS

The results of this study interpret that costs related to setup, maintenance and training of CCT and the risks related to security, reliability and vendor lock-in problems associated with CCT do not influence the continuance intention of the manager to use CCT. This result can be attributed to the fact that organizational readiness and existence of well-established IT infrastructure do not give much weight to perceived costs and risks in continuing usage of cloud computing. Perceived risks do not have a negative influence on continuance intention to use CCT. Most of the adopter firms studied are large sized firms, which are increasingly adopting cloud computing in India, because of their mature IT infrastructure and cloud readiness. The economically viable firms with their IT infrastructure and readiness to adopt cloud computing can easily handle the risks associated with cloud in terms of data privacy and security. An interview with a senior manager of a company, Wipro revealed that they find no risks associated with the adoption of cloud computing. The company used hybrid cloud for their data storage. They also revealed that non-confidential data are stored in public cloud and confidential data in private cloud. In current scenario, many large forms use both, public and private cloud architecture therefore this may be the reason why "risk" factor is found not be significantly related to the "usage" as large firms keep confidential information on the private cloud. According to KPMG report (2015), large sized firms are adopting hybrid cloud deployment model, in which they can store non-confidential information like consumer-facing data in a public cloud and confidential information like customer or client related data on a private cloud. In this way, the organizations can find cloud computing more secure and trustworthy for their data storage. Similarly, the costs being incurred in establishing and maintaining CCT do not influence the continuance intention of the manager to use CCT. This finding is concurrent with the report of Gangwar et al. (2015) that CCT adoption depends upon organizational infrastructure and proficiency related to the technology. The organization with higher level of organizational readiness and IT proficiency are more likely to use CCT.

The findings also support that perceived usefulness and perceived ubiquity significantly influence continuance intention to use cloud computing. Several companies are using cloud computing due to various advantages of strategic importance such as flexibility, scalability, pay per use, and ubiquity. CCT allows

the users to become more efficient, skillful and productive in their work environment. The users find CCT more meaningful and useful in their daily routine activities. Furthermore, perceived ease of use indirectly improves manager's continuance intention to use cloud computing through perceived usefulness. This means users find CCT easy to use and hence useful for their job performance. Rayport & Heyward (2009) suggest that the most important charm of CCT is anywhere and anytime access to its service exclusive of installing any applications. According to Park & Ryoo (2013), CCT allows the users to carry their own computing devices anywhere to use their information or applications due to its ubiquitous nature. Thus, ubiquity is one of the most important attributes of cloud service. In case of large size firms (313), the results shows that perceived ease of use does not influence perceived usefulness, the reason could be that large firms have full-grown IT infrastructure and well trained IT staff, they don't find ease of use has an influence on perceived usefulness after certain time period. Rest of the results related to other hypotheses is found same as earlier as shown in Table 7.

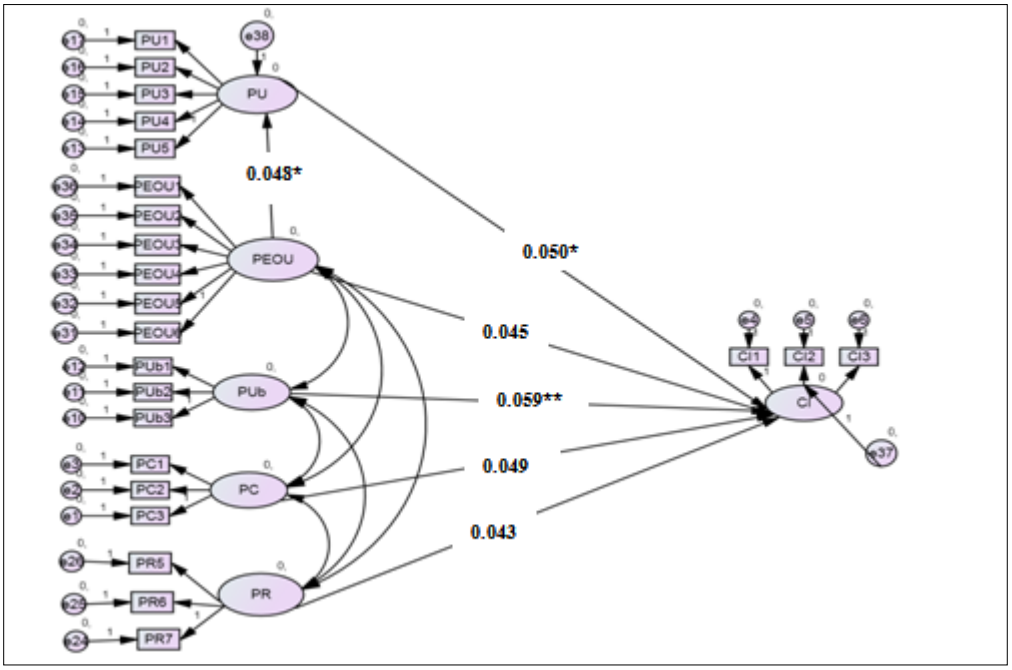

Figure 2. Structural equation modeling using AMOS

Table 6. Results of Path analysis

SI. No	Hypotheses	Path coefficient	Result
H1	Perceived usefulness positively influences continuance intention to use cloud computing	0.050	Supported ($p < 0.001$)
H2	Perceived ease of use positively influences continuance intention to use cloud computing	0.045	Not supported
H3	Perceived ease of use positively influences perceived usefulness	0.048	Supported ($p<0.05$)
H4	Perceived ubiquity positively influences continuance intention to use cloud computing	0.059	Supported ($p < 0.001$)
H5	Perceived risks negatively influence continuance intention to use cloud computing	0.043	Not supported
H6	Perceived costs influence continuance intention to use cloud computing	0.049	Not supported

Table 7: Results of path analysis (large size firms)

SI. No	Hypotheses	Path coefficient	Result
H1	Perceived usefulness positively influences continuance intention to use cloud computing	0.064	Supported
H2	Perceived ease of use positively influences continuance intention to use cloud computing	0.051	Not supported

H3	Perceived ease of use positively influences perceived usefulness	0.050	Not Supported
H4	Perceived ubiquity positively influences continuance intention to use cloud computing	0.074	Supported
H5	Perceived risks negatively influence continuance intention to use cloud computing	0.052	Not supported
H6	Perceived costs influence continuance intention to use cloud computing	0.063	Not supported

CONCLUSIONS

Cloud computing technology (CCT) provide organizations required software, suitable application platforms and IT infrastructure in a virtual environment by following any of its deployment models, namely, private, public, hybrid and community. For its continuing usage, there will be several organizational, technical and personal influencing factors. To study such factors related to adoption to a technology, there are several models reported. Of all different models proposed in technology adoption literature, TAM is the most popular one because of its extensive recognition. This study focuses on factors influencing continuance intention of cloud computing in organizations and TAM has been preferred for evaluation of such influencing factors. TAM was extended by using a set of additional variables, such as perceived costs, perceived ubiquity, perceived risks and continuance intention. Based on the hypotheses and model proposed, a questionnaire was developed. The measurement scales for all the constructs were adopted from previous studies, which are widely recognized and used. Data was collected from senior managers of the firm who are responsible for decision making and having at least two years of experience in using cloud computing. The targeted firms are adopters of cloud computing. The proposed hypotheses are tested based on the significance of the path coefficients in structural model.

Out of six hypotheses, three are supported. The factors of perceived usefulness, perceived ubiquity influence continuance adoption of cloud computing whereas the factors of perceived risks and perceived costs do not influence its continuance

intention to use. In this study most of the adopter firms are large-sized. The reason of these findings could be attributed to the fact that the large organizations with higher level of IT capability and organizational readiness do not find risks and costs as deciding factors for continuance intention to use cloud computing in the organization. The analysis is also done for 313 large firms separately where it is found that that perceived ease of use does not influence perceived usefulness. Most of the large firms have established IT infrastructure and well trained IT staff therefore they don't find ease of use has an influence on perceived usefulness after certain time period.

Thus, this study contributes to cloud computing literature by exploring the determinants of continuance intention to use CCT. The results of this study are helpful to managers to explore conducive environment for adoption of CCT and its continuous usage. The limitation of this work is in terms of limited number of variables and most of the adopter firms being large-sized firms. Focus is required to study other additional factors, such as vendor credibility and trust that can affect the continuance intention of CCT. There is a need to include more number of small-sized firms in the sample to investigate continuance adoption of cloud computing. There should be inclusion of control variables such as size of firm, organizational structure and type of industry to enhance investigation. Moreover moderating effect of age and experience should be checked to order to evaluate the continuance intention of CCT.

REFERENCES

Adams, D. A., Nelson, R. R., & Todd, P. A. (1992). "Perceived usefulness, ease of use, and usage of information technology: a replication". *MIS quarterly*, 227-247.

Aharony, N. (2015). "An exploratory study on factors affecting the adoption of cloud computing by information professionals". *The Electronic Library*, 33(2), 308-323.

Alharbi, S. T. (2012). "Users' acceptance of cloud computing in Saudi Arabia: an extension of technology acceptance model". *International Journal of Cloud Applications and Computing (IJCAC)*, 2(2), 1-11.

Armbrust, M., Fox, A., Griffith, R., Joseph, A. D., Katz, R., Konwinski, A. ... &Zaharia, M. (2010). "A view of cloud computing". *Communications of the*

ACM, 53(4), 50-58.

Arpaci, I. (2017). "Antecedents and consequences of cloud computing adoption in education to achieve knowledge management". *Computers in Human Behavior*.

Behrend, T. S., Wiebe, E. N., London, J. E., & Johnson, E. C. (2011). "Cloud computing adoption and usage in community colleges". *Behaviour& Information Technology*, 30(2), 231-240.

Bhattacherjee, A. (2001). "Understanding information systems continuance: an expectation-confirmation model". *MIS Quarterly*, 25 (3), 351–370.

Byrne, B.M. (2001). "Structural equation modeling with AMOS, EQS and LISREL: Comparative approaches to testing for the factorial validity of a measuring instrument". *Int. J. Test.*, 55-86.

Chau, P.Y.K. & Hu, P.J. (2001). "Information technology acceptance by individual professionals: a model comparison approach". *Decision Sciences*, 32 (4), 699–719.

Chin, W. (1998). "The partial least squares approach for structural equation modeling". *In G. A. Marcoulides (Ed.) Modern methods for business research (pp. 295–336). Hillsdale, NJ: Lawrence Erlbaum.*

CIO Report (2010). "Cloud computing in India: a CIO research center report", available at: http:// cioresearchcenter.com/wordpress/wp-content/plugins/download-monitor/download.php? id¼3 (accessed August 2012).

Dachyar, M., &Prasetya, M. D. (2012). "Cloud Computing Implementation in Indonesia". *International Journal of Applied*, 2(3).

Davis, F. D. (1989). "Perceived usefulness, perceived ease of use, and user acceptance of information technology". *MIS quarterly*, 319-340.

Davis, F., Bagozzi, R.P., &Warshaw, P.R. (1989). "User acceptance of computer technology: a comparison of two theoretical models". *Management Science*, 35(8), 982-1003.

Davis, G. B., & Olson, M. (1985). "Management information systems: Conceptual foundations, methods and development". *McGraw-Hill, New York.*

Ercan, T. (2010). "Effective use of cloud computing in educational institutions". *Procedia-Social and Behavioral Sciences, 2*(2), 938-942.

Fornell, C. &Larcker, D. F. (1981). "Evaluating structural equation models with unobservable variables and measurement error". *J Marketing Res,*18(1):39–47.

Gangwar, H., Date, H., &Ramaswamy, R. (2015). "Understanding determinants of cloud computing adoption using an integrated TAM-TOE model". *Journal of Enterprise Information Management,* 28(1), 107-130.

Gefen, D, Karahanna, E, Straub, D.W. (2003). "Trust and TAM in online shopping: an integrated model". *MIS Quarterly,* 27 (1), 51–90.

Gefen, D, Straub, D.W. (1997). "Gender differences in the perception and use of e-mail: an extension to the technology acceptance model". *MIS Quarterly,* 21 (4), 389–400.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). "Multivariate Data Analysis (7th Edition)". *NJ: Prentice Hall.*

Ho, R.(2006). *Handbook of univariate and multivariate data analysis and interpretation with SPSS*. CRC Press.

Hong, S., Thong, J. Y., & Tam, K. Y. (2006). "Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet". *Decision support systems*, *42*(3), 1819-1834.

Hong, W, Thong, J.Y.L., Wong, W.M., Tam, K.Y. (2001). "Determinants of user acceptance of digital libraries: an empirical examination of individual differences and system characteristics".*Journal of Management Information Systems* 18 (3) 97–124.

Hsu, P. F., Ray, S., & Li-Hsieh, Y. Y. (2014). "Examining cloud computing adoption intention, pricing mechanism, and deployment model". *International Journal of Information Management*, 34(4), 474-488.

Hu, L. &Bentler, P. (1999). "Cutoff criteria for fit indices in covariance structure analysis: conventional criteria versus new alternatives". *Structural Equation Modeling,* 6, 1-55.

Hu, P.J., Chau, P.Y.K., Sheng, O.R.L., Tam, K.Y. (1999). "Examining the technology acceptance model using physician acceptance of telemedicine technology". *Journal of Management Information Systems,* 16 (2), 91–112.

IDC report (2012). "Cloud computing market may grow 70% this year: IDC". Available at *http://www.thehindubusinessline.com*.

Igbaria, M, Parasuraman, S Baroudi, J.J. (1996). "A motivational model of microcomputer usage". *Journal of Management Information Systems*. 13 (1), 127–143.

Karahanna, E, Straub, D.W., Chervany, N.L. (1999). "Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs". *MIS Quarterly,* 23 (2),183–213.

Khajeh-Hosseini, A., Greenwood, D., Smith, J. W., &Sommerville, I. (2012). "The cloud adoption toolkit: Supporting cloud computing adoption in the enterprise". *Software: Practice and Experience,* 42(4), 447–465.

Kim, S., & Garrison, G. (2009). "Investigating mobile wireless technology adoption: An extension of the technology acceptance model". *Information Systems Frontiers*, 11(3), 323-333.

Konana, P &Balasubramanian, S (2005). "The social–economic–psychological model of technology adoption and usage: an application to online investing". *Decision Support Systems,* 39 (3), 505–524.

KPMG report (2015). "Cloud computing for all". Available at *www.thenextmillion.com.*

Kuan, K. K., &Chau, P. Y. (2001). "A perception-based model for EDI adoption in small businesses using a technology–organization–environment framework". *Information & management*, *38*(8), 507-521.

Lal, P., &Bharadwaj, S. S. (2016). "Understanding the Impact of Cloud-Based Services Adoption on Organizational Flexibility: An Exploratory

Study". *Journal of Enterprise Information Management,* 29(4).

Lederer, A.L., Maupin, D.J., Sena, M.P., Zhuang, Y. (2000). "The technology acceptance model and the World Wide Web". *Decision Support Systems,* 29 (3), 269–282.

Lian, J. W., Yen, D. C., & Wang, Y. T. (2014). "An exploratory study to understand the critical factors affecting the decision to adopt cloud computing in Taiwan hospital". *International Journal of Information Management,* 34(1), 28-36.

Limayem, M., Hirt, S. G., & Cheung, C. M. (2007). "How habit limits the predictive power of intention: The case of information systems continuance". *MIS quarterly,* 705-737.

Lin, A., & Chen, N. C. (2012). "Cloud computing as an innovation: Perception, attitude, and adoption". *International Journal of Information Management,* 32(6), 533-540.

MacCallum, R. C. & Austin, J. T. (2000). "Applications of structural equation modeling in psychological research". *Annual Review of Psychology,* 51, 201-226.

Mell, P., &Grance, T. (2011). The NIST definition of cloud computing.

Nunnally, J. C., & Bernstein, I. H. (1978). "Psychometric theory (3rd ed.)". *New York: McGrawHill.*

Obeidat, M. A., &Turgay, T. (2012). "Empirical Analysis for the Factors Affecting the Adoption of Cloud Computing Initiatives by Information Technology Executives". *Journal of Management Research,* 5(1), 152-178.

Opitz, N., Langkau, T. F., Schmidt, N. H., & Kolbe, L. M. (2012). "Technology acceptance of cloud computing: empirical evidence from German IT departments. *In System Science (HICSS)". 45th Hawaii International Conference on (pp. 1593-1602). IEEE.*

Park, S. C., &Ryoo, S. Y. (2013). "An empirical investigation of end-users' switching toward cloud computing: A two factor theory perspective". *Computers in Human Behavior*, 29(1), 160-170.

Phonthanukitithaworn, C., Sellitto, C., & Fong, M. W. (2015). "A Study of Mobile Payment (M-Payment) Services Adoption in Thailand". In *Encyclopedia of Information Science and Technology, Third Edition* (pp. 731-741). IGI Global.

Premkumar, G., & Roberts, M. (1999). "Adoption of new information technologies in rural small businesses". *Omega*, *27*(4), 467-484.

Rayport, J. F., & Heyward, A. (2009). "Envisioning the cloud: The next computing paradigm and its implication for technology policy". Available at http://www.marketspaceadvisory. com/cloud.

Ross, P., & Blumenstein, M. (2013). "Cloud computing: the nexus of strategy and technology". *Journal of Business Strategy*, 34(4), 39-47.

S. Taylor, P.A. Todd (1995). "Assessing IT usage: the role of prior experience". *MIS Quarterly* 19 (4) (1995) 561–570.

Senk, C. (2013). "Adoption of security as a service". *Journal of Internet Services and Applications*, Vol. 4 No. 11, pp. 1-16.

Sharif, A. M. (2010). "It's written in the cloud: the hype and promise of cloud computing". *Journal of Enterprise Information Management*, 23(2), 131-134.

Sharma, S. K., Al-Badi, A. H., Govindaluri, S. M., & Al-Kharusi, M. H. (2016). "Predicting motivators of cloud computing adoption: A developing country perspective". *Computers in Human Behavior*, *62*, 61-69.

Szajna, B. (1996). "Empirical evaluation of the revised TAM".*Management Science*, 42 (1), 85–92.

Venkatesh, Davis, F.D. (1996). "A model of the perceived ease of use development and test". *Decision Sciences* 27 (3) 451–481.

Venkatesh, V (1999). "Creation of favorable user perceptions: exploring the role of intrinsic motivation". *MIS Quarterly* 23 (2) 239–260.

Venkatesh, V., &Bala, H. (2008). "Technology acceptance model 3 and a research agenda on interventions". *Decision sciences*, 39(2), 273-315.

Venkatesh, V., & Davis, F. D. (2000). "A theoretical extension of the technology acceptance model: Four longitudinal field studies". *Management science*, 46(2), 186-204.

Venkatesh, V., & Morris, M. G. (2000). "Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior". *MIS quarterly*, 115-139.

Wheaton, B., Muthen, B., Alwin, D., F., and Summers, G. (1977). "Assessing Reliability and Stability in Panel Models". *Sociological Methodology*, 8 (1), 84-136.

Wu, W. W. (2011). Developing an explorative model for SaaS adoption. *Expert systems with applications*, *38*(12), 15057-15064.

Wu, W. W., Lan, L. W., & Lee, Y. T. (2013). "Factors hindering acceptance of using cloud services in university: a case study". *The Electronic Library*, 31(1), 84-98.

Yang, H. &Yoo, Y. (2004). "It's all about attitude: revisiting the technology acceptance model". *Decision Support Systems*, 38 (1), 19–31.