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Adoption Factors of Cloud Computing Technology

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Thabit Qasem Awad Atobishi

Abstract

Cloud computing as newest paradigm shift that will reshape the way of delivering services of information technology. Decision makers in business organization still have many concerns could late or cancel the adoption of cloud computing. This research project is a research to initially investigate and evaluate the factors that influence and affect the adoption of cloud computing technology in business Jordanian organizations. This study is based on Technology Acceptance Model which is modified to fit the context and Factors used for this study are: Perceived Usefulness, Perceived Ease of Use, Perceived Risk/Security, Cloud Computing Awareness, compatibility, cost, and Intention to adopt which is dependent variable in this study. 5 Likert scale questionnaire was designed to collect data from IT employees of Jordanian business organization. Data was collected from 175 IT employees. Linear regression was used to analyze data, using SPSS software. The results showed that perceived ease of use, perceived usefulness, cost, perceived risk were statistically significant in affecting the decision of adopting cloud computing, while compatibility and cloud computing awareness were found not to be statistically significant. This research support cloud computing services providers to understand better factors that influence adoption or non-adoption of cloud computing as well as the other researchers can get better understand of cloud computing adoption status in Jordan

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CHAPTER 1

RESEARCH BACKGROUND

1.1 Introduction

New big change in information technology sector takes place nowadays in everywhere using information technology services which so-called “cloud computing “. This new paradigm shift expects to reform all information technology industry and the way of delivering information technology services to the business organizations, it’s expected that the leaders in cloud computing industry will reach 160 billion dollars revenue (Behrend et al. , 2010) . Many advantages organizations can gain by this new technology such as on-demand -service, more mobility access, shared resource pooling, rapid elasticity, and pay measured service which eventually leads to cost reduction and more efficiency (Mell & Grance, 2011).

in near future information technology services will deliver to business organization as fifth utility to be like water, telephone, gas and electricity (Monroy, Arias, & Guerrero, 2013).

Despite its great benefits, the decision of adopting cloud computing have many concerns about this new technology. The perceived ease of use and the perceived usefulness are important factors in adopting new innovative technology (Davis,

1985). But also, in cloud computing adoption there is another factor that can be classified as technology, human and organizational factors (Lian et al., 2014).

Jordan as a developing country still suffering lack of cutting-edge technology and the digital divide is high compared with developed countries. So that cloud computing considers as promised with its huge possibilities to help business organizations to overcome this digital divide. but as any new technology many concerns about the adoption of this technology.

Why cloud computing matters to Jordan?

Jordan is a developing country with a growing population reached more than ten millions in March 2020 (DOS , 2020) which is located in the middle east, this region has been suffering from many crises during the past decades, and these crises have influenced the economic situation and reflected on the economy of Jordan since Jordan is hosting million of refugees from neighbouring countries.the economic measures showed that the GDP is 1.9% , the unemployment rate hit 19% in 2019 and the inflation reached 1.91 in February 2020 (DOS , 2020)

Information and communication technology (ICT) sector are a promising sector in Jordan that can help in developing the economy and reduce the impact of its crisis specially the unemployment issue. the total expenditure on IT in Jordanian businesses organizations in 2016 reached 98 million JD (DOS, 2016) which comprises of purchasing hardware, buying software licenses, acquiring and training the employees. Also 82% of the employees in Jordanian business organizations

use the internet in their work and have an access and about 70% of the Jordanian business organizations have an access to the internet as well as 3359 Jordanian business organizations use the internet from outside of their workplaces , 44% of the Jordanian business organizations in 2016 were using the internet in their research and development activities (DOS , 2016) . the previous information means Jordanian business organizations are capable to get the cloud computing services in the future (DOS, 2016).

Cloud computing can be an effective solution to allow the Jordanian companies and entrepreneurs to utilize the cutting-edge IT solutions at a reasonable price through the cloud computing solutions: infrastructure as a service, platform as a service and software as a service.

1.2 Empirical research

Statement of the problem

Cloud computing as newest paradigm shift that will reshape the way of delivering services of information technology. Decision makers in business organization still have many concerns could late or cancel the adoption of cloud computing.

Just few studies that investigate the factors that affect the decision to adopt cloud computing and this factors still need deep investigation to determine the most critical factors. In developing country like Jordan, the business organizations can get the advantages of cutting-edge technology by adoption of cloud computing but many

factors affect decision makers to adopt this technology and this study will be one of rare studies in Jordan to evaluate the critical factors in decision to adopt this technology. Most of previous studies focus technical factors and used well-known TAM MODEL but this study was expanded to focus on economic, human and organizational study.

1.3 Research objectives

The paper is about conducting researches in Jordanian business organizations, cloud computing considers one of the hottest topics in information technology research areas. This research aims to identify the main factors that affect the decision to adopt the cloud computing technology in Jordanian business organizations and clearly evaluate the influence of this factors.

1.4 Research questions

this study attempts to answer the following questions:

1- What are the main factors influence the decision to adopt cloud computing?

2- How these factors affect the decision of adoption cloud computing technology?

1.5 Research model

The model of this study used TAM variables and utilized other variables from (u, J., & Wang, S. (2005). What drives mobile commerce? Information & Management, 42(5), 719-729. doi:10.1016/j.im.2004.07.001 &Zeqiri, A., Aliu, L., Kostanica, F., & Prenaj, B. (2017). An empirical investigation of cloud computing usage in education. La Revue Des Sciences De Gestion, 285-286(3), 77.

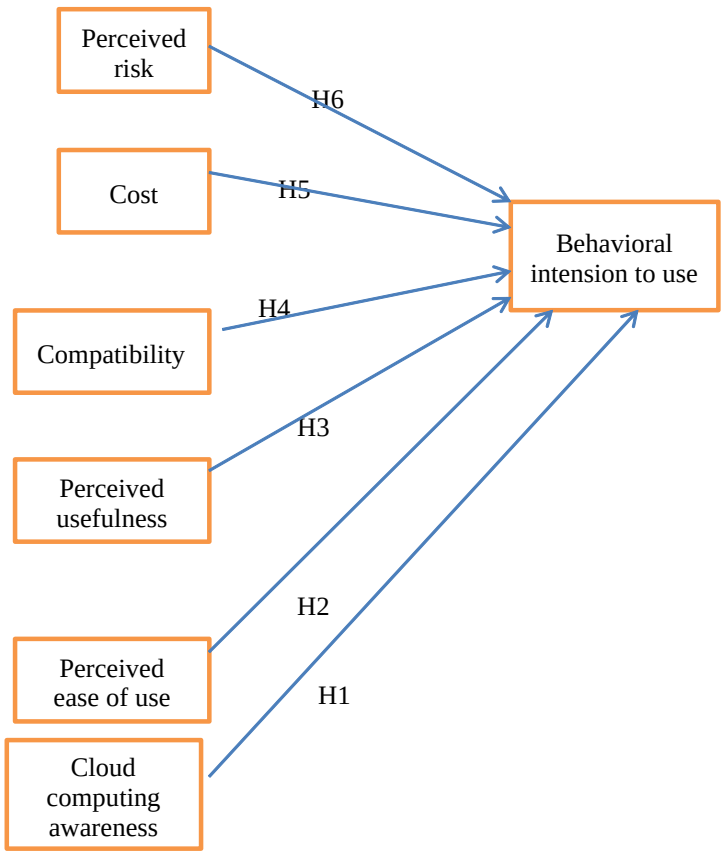

Figure 1: Research Model

(Source: own construction)

1.6 The hypothesis

Based on the research model and after reviewed the other studies we identified the below hypothesis

The hypotheses:

H1. Cloud computing awareness to use has a direct effect on Behavioral intension to use

H2. Perceived ease of use has a direct effect on behavioral intention to use.

H3. Perceived usefulness has a direct effect on behavioral intention to use

H4. Compatibility has a direct effect on behavioral intention to use

H5. Cost has a negative direct effect on behavioral intention to use.

H6. Perceived risk has a negative direct effect on behavioral intention to use

1.7 Methodology of the study

This research follows the following methodology in order to achieve the purpose of research:

1. Collect academic literatures that report the frameworks and finding of studies determine and evaluate the most critical factors that affect the decision to adopt cloud computing in business organizations.
2. Design a conceptual model that represents the relationship among influential factors and decision of adoption cloud computing.

3. Design a survey questionnaire survey to collect data from IT employees in Jordanian business organizations.

In this research, the descriptive statics are utilized in the description of questionnaire respondent and sample characteristic. The "Statistical Package for Social Science" (SPSS) are utilized to check the research hypotheses through using structural equation modeling analysis.

CHAPTER 2

LITERATURE REVIEW

2.1 Cloud computing

Since the internet advent in the late 20th century to the ubiquitous computing facilities of present day, the internet has drastically changed the whole world of computing. It has moved from the parallel computing concept to distributed, grid and now to cloud computing (Jadeja & Modi, 2012). According to Behrend et al (2010), cloud computing is referred to the software applications and several other resources available online via internet to multiple users, rather than being installed in local computers of certain users only. Rader (2016) also defined cloud computing as an act of performing business activities on off-premises and shared computing systems. The concept has been developed due to the recent innovation in technology virtualization, hardware, service delivery and distributed computing over the internet. The metaphor 'cloud' is a clear reference of universal accessibility and availability of computing resources through internet techniques (Lin & Chen, 2012). According to Botta et al (2016), users and businesses through cloud-based solutions can have easy access to an immense computing power at relatively lower cost. It is because by moving different functions of Information Technology (IT) such as applications used by businesses, services and storage to the cloud, business firms can reduce technology implementation and its usage cost.

The traditional models of software in which organizations were tied to applications and which were supplier specific, restricted by license of users, required software upgrades or patches and incurred annual license fees are being replaced by the cloud computing solutions (Hinde & Van Belle, 2012). Also, the cloud computing system provides monetary benefits, which cannot be ignored by business organizations. However, many scholars identified privacy and security as two biggest issues in cloud computing (Kshetri, 2013; Jadeja & Modi, 2012; Liu et al 2013). It is because, some people fear to share their important confidential data to another company. The authors inferred that customers pay to cloud service vendors when they find them reliable and trustworthy in security measures. Another factor that affects cloud computing is privacy. Data can be extracted from any place, so privacy of clients cannot be compromised (Pearson, 2013). Furthermore, reliability is also considered as an issue in cloud computing (Sanaei et al 2014).

According to National Institute of Standards and Technology (NIST), the cloud computing model is enabled on demand and convenient network access to a common pool of configured computing resources including storage facilities, various servers, data networks, services and other applications), which can be provisioned rapidly with minimum interaction of service providers and management efforts (Mell & Grance, 2011). Based on the technical definition given by the aforesaid institution, the following essentials constitute a cloud computing system:

Wide network access–Services and resources located in distinct areas of vendors in the cloud can be obtained from different places and provisioned through

standard tools by thick or thin inharmonious clients. The terms ‘capability of global reach’ and ‘standardised mechanisms’ for easy access are also used to refer such characteristics (Mell & Grance, 2011).

Self-service on demand– Cloud computing allows users to request one or more services whenever they require them and use the method of ‘pay-and-go’ to pay without having interaction with individuals using control panel online.

Resource pooling–The single blended resource behaviour is stimulated by offering group of resources in cloud computing. It means, users are not required to know and do not have any knowledge regarding the location from where resources are provided. Such approach supports suppliers to offer several virtual or real resources in a dynamic manner in the cloud (Hamdaqa & Tahvildari, 2012).

Measured services–Different aspects of cloud computing can be automatically reported, optimized, monitored and controlled at various abstract levels for both consumers’ and vendors’ resources.

Rapid elasticity – Basically, it is known as scalability, which means to scale down or scale up resources as and when needed. Users through cloud computing can request as much as resources and services as they can at any point of time. Based on this exceptional characteristic, a well-known cloud service provider, i.e. Amazon has named one of its most commonly used and popular services as EC2 (Elastic Compute Cloud) (Balduzzi et al 2012).

Multi-tenacity–The Cloud Security Alliance has suggested multi-tenacity as an important characteristic of a cloud. The particular characteristic means that it is important to have models for segmentation, policy-driven enforcement, governance, isolation, chargeback/billing and service levels for the customers' belonging to different categories (Espadas et al 2013).

Certifiability and auditability – This last characteristic of cloud means that it is essential to prepare trails and logs for the services, in order to facilitate evaluation of an extent to which policies and regulations are observed (Hamdaqa & Tahvildari, 2012).

Types of Cloud computing services

Services which are mainly provided by cloud computing can be categorized in following types:

SaaS (Software as a service) –It involves delivering a piece of software to the users over internet. The software can be installed by users to use the application anywhere and anytime where they have internet access (Wu, Garg & Buyya, 2012; Seethamraju, 2015). There is also a process in the category of SaaS, by which distinct software applications rent are offered by the vendors of application service through internet by leveraging the infrastructure of cloud and services released by Google Apps, Salesforce.com CRM (customer resource management), Microsoft BPOS and Oracle Siebel on Demand (Low, Chen & Wu, 2011). The benefits of particular cloud service model include centralized hosting and configuration,

delivery of accelerated feature and updates of software release without requiring reinstallation (Karunakaran, 2013).

IaaS (Infrastructure as a service)–It is referred to cloud services' basic level which offers infrastructure services to the users over internet, such as software (e.g. different technologies for virtualization and computers' operating systems) and hardware (e.g. data network and storage facilities). Also, equipment in this particular service is owned by the vendor, who is solely responsible for running, housing and maintaining it (Manvi & Shyam, 2014; Arora, P., Wadhawan & Ahuja, 2012). On the other side, users have complete control over storage, deployed applications and operating systems (Jula, Sundararajan & Othman, 2014). Typically, client in IaaS pays on the basis of per-use and services are offered by Amazon.COM AWS, Verizon CaaS and IBM Blue Cloud (Low, Chen & Wu, 2011). This model's benefits comprise resource elasticity and pay-per-use to match the demands of computing.

PaaS (Platform as a service) – It is considered as next (generally, second) level of cloud computing that provides access to various resources online, which are needed to create an application (Gangwar, Date & Ramaswamy, 2015; Giessmann & Stanoevska, 2012). The services in PaaS category comprise designing application, its development, work testing, deployment and hosting tools that provides access to libraries and programming language, etc. (Gonidis et al 2013). PaaS also allows customers to use infrastructure platform presented over internet to develop and deploy applications (Hashizume et al 2013). In such case, the customers are not required to purchase, install and manage the infrastructure platform, if there is

common programming language among the vendors of cloud services. Thus, it can be said that clouds are represented by PaaS that access many databases, storage functions and computers provided in a virtualized platform of internet and also through services released by Google App Engine, Microsoft Azure and Salesforce.com (Low, Chen & Wu, 2011). The most important benefit of this model is its capacity to offer each aspects of developing software (including design, version control, testing, hosting and maintenance) over the internet.

2.2 Cloud deployment models

The main task in cloud computing solution deployment is to decide the implementation of cloud type. According to Jadeja & Modi (2012), deployment models for the cloud architecture solutions can be of four types, which are as follows:

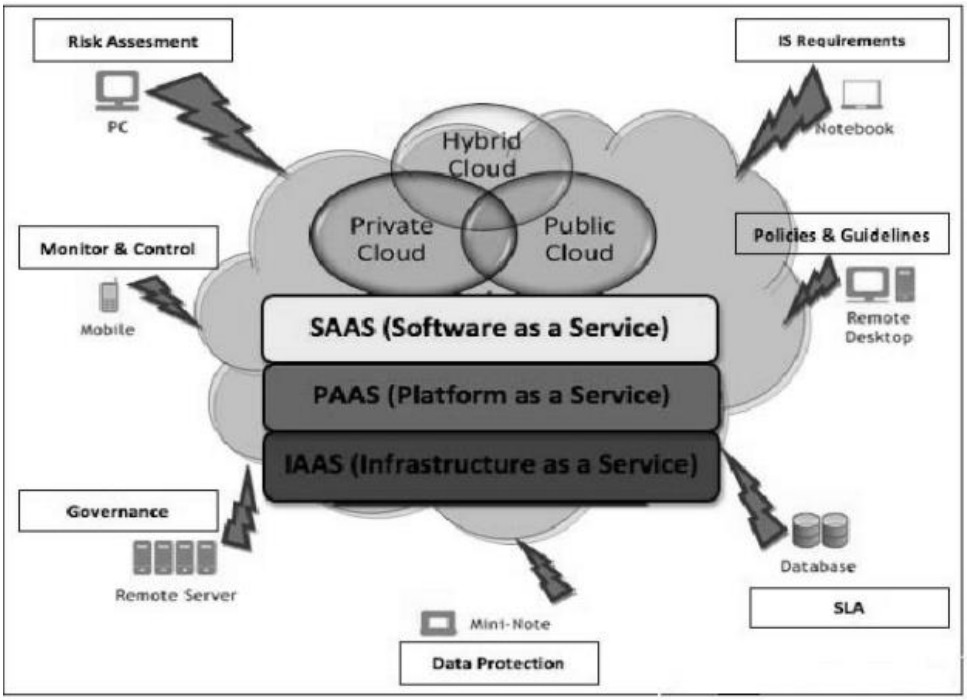

Figure 2: Cloud computing map

(Source: Jadeja & Modi, 2012)

Public clouds

In this type, a large group of the industry and/or general public can access the cloud infrastructure which is maintained by the company providing cloud computing services (AlZain et al 2012). Also, resources in public clouds are provided in a form of service, generally through internet connection by charging fees on the basis of pay-per-usage. The usage can be scaled up by the users on demand and they are not required to buy hardware, in order to avail this service. In this regard, Goyal (2014) stated that public cloud vendors manage pool resources and infrastructure to meet their users' demands. Any person can use public cloud by having an internet

connection, as it is hosted over internet. Usually, residential users access public cloud services and through network of internet service providers, they connect to public internet. Some examples of public cloud suppliers are Microsoft, Amazon and Google providing services to general public (Kalapatapu & Sarkar, 2012). Moreover, data generated and submitted by customers are mainly stored on the third-party suppliers' servers. However, in comparison to other cloud models, the public clouds are said to be less secure in comparison to private cloud as entire data and all applications on public cloud are more prone to malevolent attacks (Zissis & Lekkas, 2012).

In this context, Goyal (2014) stated that even though security is the biggest problem faced by public cloud, the paradigm of cloud computing offers innovation opportunities in provisioning security, which holds possibility of enhancing some organizations' overall security. The main advantages are gained by small sized firms, which have less number of information technology security personnel and administrators and through large data centers they can also obtain economies of scale presented to big corporations, by transitioning to public cloud. Moreover, the security risk can be reduced in public cloud by implementing security checks through validation of both client and cloud vendor (Modi et al 2013; Bhadauria & Sanyal, 2012).

Private cloud

In this model, the organization solely operates the cloud infrastructure. Private cloud, in general, is managed and maintained by the company or any other third party and might be present off premise or on premise. Thus, it can be said that in private cloud computing setting, the organizational members or granted third parties can only access the cloud infrastructure. Here, general public is not allowed to use cloud services and organizational members can only use the infrastructure. For instance, a company makes available the customer data to its different stores (Lu, Xu & Xu, 2014). Moreover, a private cloud is held in the company's data center and offers services to the organizational members and its partners only. Also, in comparison to public clouds, the security considerations are more in the private cloud setting. According to Hsu, Ray & Li-Hsieh (2014), a private cloud possibly gives more control to the organization over computational resources and infrastructure. However, Jadeja & Modi (2012) determined that high cost is the main drawback of private cloud. It is because a company having private cloud needs to incur cost in purchasing software and equipment and is required to maintain qualified staff members at the workplace.

Hybrid cloud

Hybrid cloud model is the combination of both private and public clouds. However, private cloud in this hybrid model remains connected to one or more external cloud services. It is more safe method of controlling applications and data and facilitates

the party to obtain information through internet (Arora, Wadhawan & Ahuja, 2012). Hybrid cloud enables firms to meet their needs in private cloud and in case any occasional need emerges then company asks the public cloud for large computing resources (Jadeja & Modi, 2012). However, in comparison of other deployment models, hybrid clouds are more difficult to be used by the companies, as they comprise an alignment of two or more clouds (public, community or private). Moreover, every member in the particular cloud remains a unique personality but at the same time, all the members are bound to others by proprietary or standardized technology, which enables data and application portability among them (Zissis & Lekkas, 2012).

Besides above, an organization in hybrid cloud offers and manages some resources out-house and some in-house. For instance, companies have their CRM and HR data in a Salesforces.com (public cloud) and in their private cloud have confidential data (Srinivasan, Quadir & Vijayakumar, 2015). Generally, the businesses through hybrid approach take the benefit of cost-effectiveness and scalability, which is offered by public cloud computing environment without revealing mission, critical data and applications to third party susceptibilities (Sethi, Sahu & Jena, 2012). But by extending its IT perimeter outside the boundaries of organization, the hybrid clouds are more prone to attacks. Also, hybrid cloud makes much easy flow of information from private to public cloud environment. However, integrity and privacy concerns are connected with such movement of data because in public cloud

environment, the privacy controls significantly vary from the private cloud (Goyal, 2014).

Community cloud

In community cloud model, more than one organization together builds a shared infrastructure for the target set of consumers; in this respect, this model falls somewhere between private and public cloud (Jadeja & Modi, 2012). Apart from the characteristic of private cloud i.e. to be operated solely for a pre-determined group of consumers, it has the features of public cloud in terms of shared computational resources available to two or more organizations which have common policy considerations for security and privacy. The model utilizes the resources' network of spare personal computers to provide the data centers facilities in a way that the community organizations be responsible for the computing power for the cloud. In this way, it promotes open standards for the principles of green computing and Ecosystem Digital (Rimal & Choi, 2012). Though the model is sensitive to issues of information privacy among the community members, several steps can be taken to ensure the integrity of data such as to outsource the administration of community cloud to a third-party cloud provider. It is advantageous as the external party would be bound by a contract and may not have any preference to any of the client from the community. One of the key issues of community model is that community members have a pre-set bandwidth amount and data storage availability. Another issue is the cost of setting up the community cloud which is higher than public cloud;

however, the cost is cheaper than private cloud due to the splitting up of costs among all community members (Goyal, 2014).

2.6 Factors that affect decision to adopt cloud computing

Multinational companies are focusing more on adopting information technology to compete in an ever-changing market. The customers are increasingly demanding more products choices and high products quality at lower prices. In order to meet such needs of customers, the organizations are adopting more complex IT systems. It is because accurate and timely information is the key of achieving efficiency in performance and information technology is significantly considered as a tool to obtain needed efficiency to remain competitive (Laudon & Laudon, 2016; Huang et al 2012). However, Davis, Bagozzi & Warshaw (1989, p.982) inferred that organizational performance cannot be improved by computer systems, if they are not used properly. In this context, Sichel (2001) identified that an important factor which contributes to the contradiction of productivity is low usage of installed information systems, which also defines less financial returns on investments in IT. Also, it seems that human beings are unwilling to adapt with the changes (Gonçalves & da Silva Gonçalves, 2012). Moreover, risk presents in all projects of IT and resistance of users can increase such risk level. Therefore, information systems' successful implementation that range from simple applications, like spreadsheets and word processing to more complicated apps requires acceptance of users.

In the above context, a model has been proposed by Davis, Bagozzi & Warshaw (1989) to evaluate the manner in which users accept new technologies, which is known as TAM (Technology Acceptance Model). The particular model was developed to forecast new IT use and individuals' level of adaptation with it. TAM suggests two beliefs including 'perceived ease of use' and 'perceived usefulness', determining behavioral intention of individuals to use information technology. Perceived usefulness is referred to the extent to which a person assumes that utilizing IT will improve his/her performance at the job. While, perceived ease of use is referred to an extent to which an individual believes that adopting new IT system in his/her routine operations will require no additional efforts (Sentosa & Mat, 2012; Yang, Kim & Yoo, 2013). The model also provides that external variables (such as, design characteristics) affect behavioral intention that is mediated by two variables, 'perceived ease of use' and 'perceived usefulness', which can be seen in the following figure:

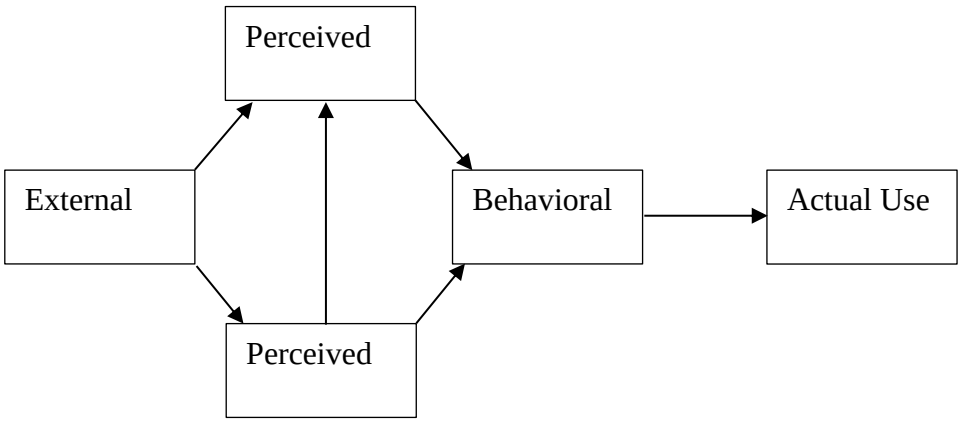

Figure 3: Technology Acceptance Model

(Source: Obeidat & Turgay, 2012)

However, Dwivedi, Wade & Schneberger (2011) criticised the framework of TAM by stating that it provides very less guidance to the companies on how to craft interventions to stimulate new technologies' acceptance among users. It means TAM considers a narrow view of innovation and constructs a limited picture of technology adoption issue. Though the model has been connected with high degree of reliability, simplicity, validity and high predictive ability but has been also criticized for its few constructs, which makes it ineffective to capture some behavioral characteristics and thus, produces less information. Another criticism to the model is that it fails to define how usage or adoption can be enhanced by utilizing the variables and apart from perceived usefulness and perceived ease of use, it fails to integrate other aspects, which also creates significant impact on the users to accept new technology (Ishak & Newton, 2016).

Consequently, Venkatesh & Davis (2000, p.453) proposed TAM 2 model by integrating seven additional variables into TAM that influence the technology's perceived usefulness. TAM-2 model defines the usage intentions and perceived usefulness in terms of cognitive instrumental processes and social influence. The social influences comprise factors (voluntariness, image and subjective norm) and cognitive instrumental processes include factors. Also, it has been provided by TAM 2 that voluntariness and experience interrelate with subjective norms to share adoption intentions and perceived usefulness. Further, TAM 2 suggests that growing experience through an information system creates impact on both intention to use

and perceived usefulness. Also, a mediator of intention to use is voluntariness, which can be seen in the below figure:

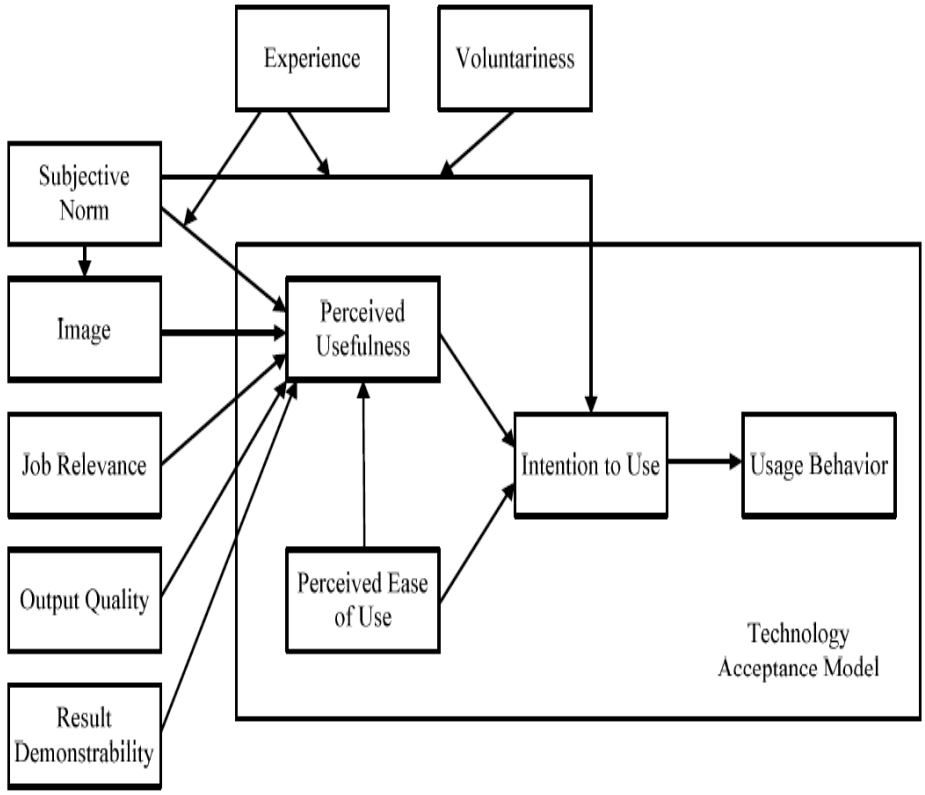

Figure 4: TAM 2 Extension of TAM

(Source: Venkatesh & Davis, 2000)

According to Venkatesh (2000), various aspects that influence ease of use in TAM can also be determined through behavioural decision theory. The particular theory posits that two-common heuristic of decision making are anchoring and adjustment, which individuals generally use. In case a person lacks the specific knowledge then heuristic suggest him/her to rely on general information, which works as an 'anchor' and actually individual are unable to ignore such anchoring information in their

decision-making process. While, in case individuals have additional information then to reflect such information they likely adjust their judgements, still have faith on initial criteria of anchoring. Particularly, individuals prior having direct experience of new technology are likely to anchor their new system's perceived ease of use to their common beliefs regarding computer and its uses. Also, it is expected that individuals by having increasing experience of any new system, adjust their system-specific perceived ease of use, in order to reveal the way in which they deal with the particular system.

Furthermore, it can be seen in fig. 4 that system-independent anchoring constructs include system (computer) self-efficacy, system playfulness, facilitating conditions (for example, 'perceptions of external control') and computer anxiety, which play a significant role in shaping individuals' 'perceived ease of use' related to new system, specifically their experience at the early stage of dealing with the system. Also, when experience increases with the system, then adjustments including facilitating condition as it belongs to specific system, objective usability and perceived enjoyment from the use of system have an additional impact on the system-specific perceived ease of use (Hess, McNab & Basoglu, 2014).

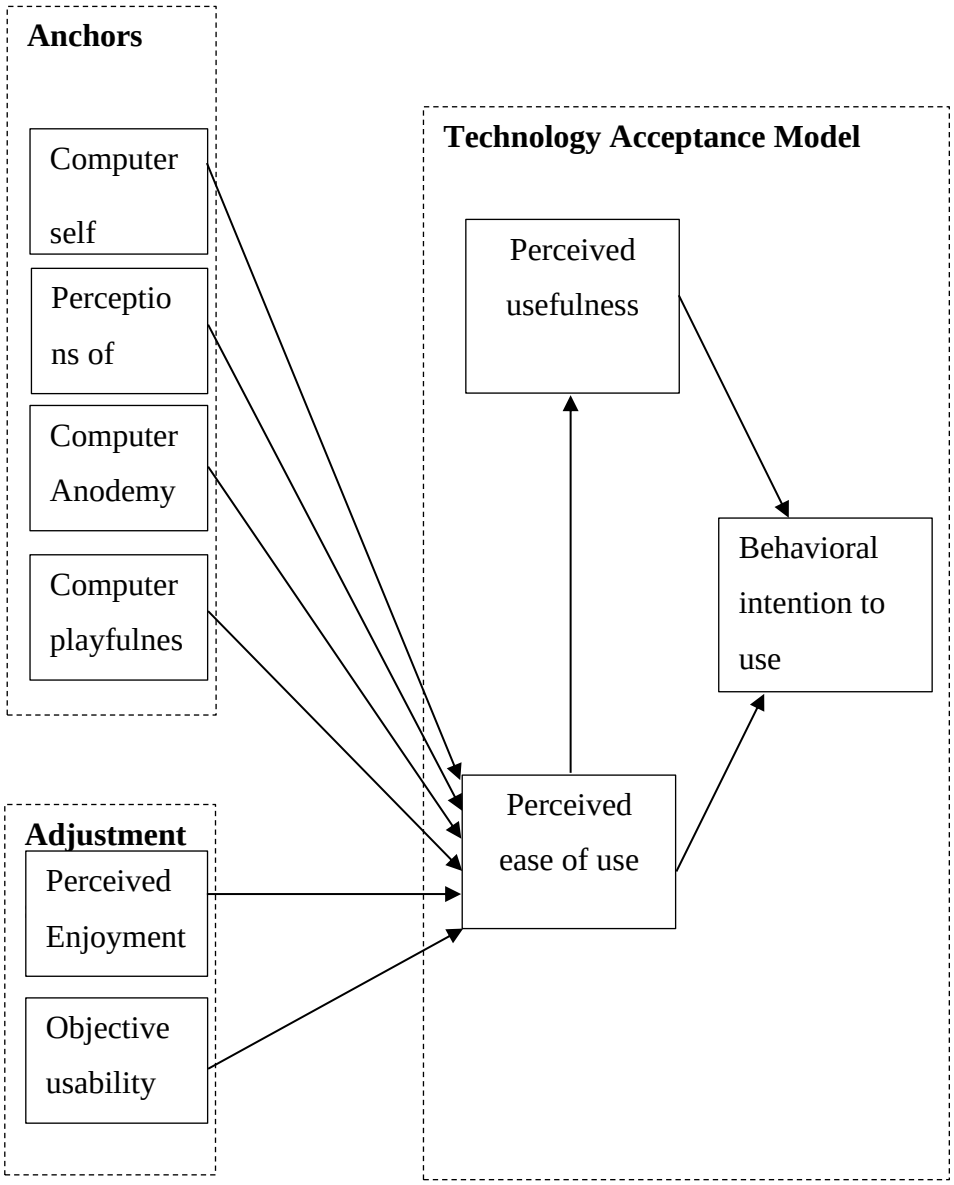

Figure 5: Theoretical Model of the Determinants of Perceived Ease of Use

(Source: Venkatesh, 2000)

2.7 Diffusion of innovation theory

Agarwal & Prasad (1997) studied individuals' perception and their concerns regarding new innovative technology characteristics, which is not limited to variables of TAM but comprise and evaluated two outcomes in such context on the basis of users' perception. First is new technology utilisation and willingness to keep on using the same. Second is perceived volunteers variable which means whether the new technology adopters feel that supervisors are mandatory to deploy and use the new technology or not.

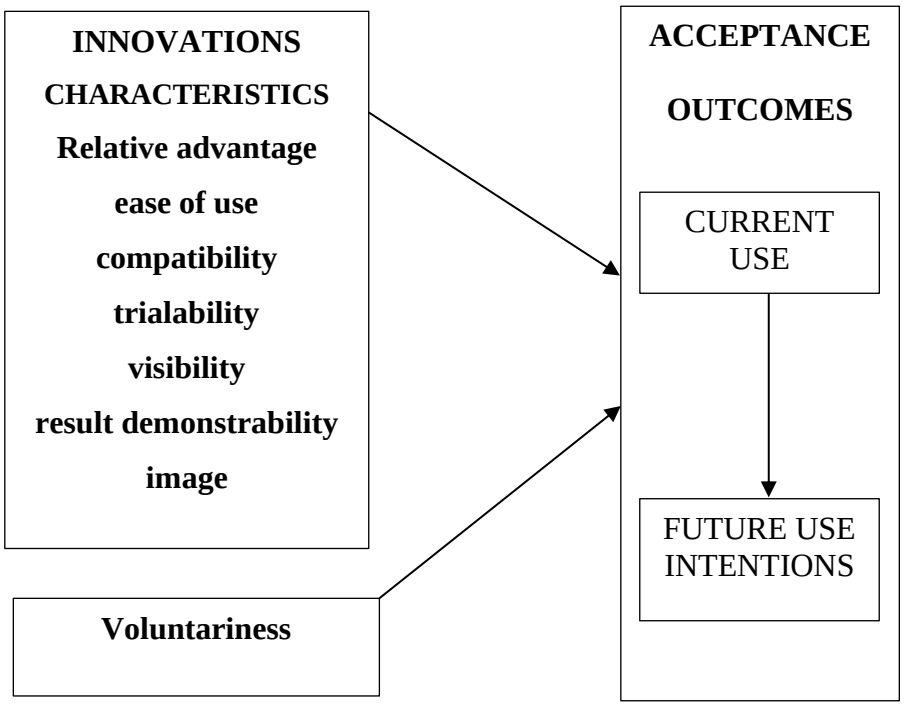

Figure 6: Diffusion of innovation theory

(Source: Agarwal & Prasad, 1997)

Sabi et al (2015) also conducted an important study on factors (including technological and economic) that affect the cloud computing adoption decision in developing nations. The model of Sabi et al (2015) has built on diffusion of innovation theory and TAM and its test has proved that economic and technological factors significantly affect the users' decision to adopt the cloud computing system. Based on the study of Iqbal et al (2016), economic feasibility dimension influences the decision of adopting cloud computing system. Thus, it can be said that different authors determined different factors that affect IT adoption in the organization. Consequently, a theoretical model is needed to consider the weaknesses in technological innovation adoption and diffusion that are caused by specific environmental, organizational and technological contexts of the firm. In this regard, many researchers have been credited by proposing the TOE framework to analyses new technology adoption by the companies (Low, Chen & Wu, 2011; Alshamaila, Papagiannidis & Li, 2013; Ahmadi, Ibrahim & Nilashi, 2015; Saedi & Iahad, 2013), which is illustrated in the subsequent section.

2.8 Technology-Organization-Environment (TOE) framework

Tornatzky and Fleischer developed a multi-perspective TOE framework in 1990. It is an organizational-level theory, which characterizes only one part of innovation process, such as how the company's context influences its capability to adopt and implement new technology (Baker, 2012). On the basis of this framework, there are three factors of an organization's context, which influence its process to adopt

technological innovation. First is technological context that represents the external and internal technologies of the companies, i.e. both the technology available in market but not currently in use as well as the technology already in use by the firm. Such technologies might include either practice or equipment. Second is organizational context, which is related to firm's characteristics and resources, such as its managerial structure and size. For instance, in comparison to small firms, the big companies have more capital to invest in new technology adoption and implementation (Saedi & Iahad, 2013). Third is environmental context, which is about the arena wherein the company carries out its business activities. The environmental context can be related to the availability of technical service providers and surrounding elements, like competitors, industry, etc. For instance, during the intense competition in the market, the companies face pressure to accept new technology and innovation, in order to achieve competitive edge over others (Baker, 2012). Therefore, it can be said that both opportunities and constraints for technological adoption are presented by these three contexts, which can be seen in the following figure:

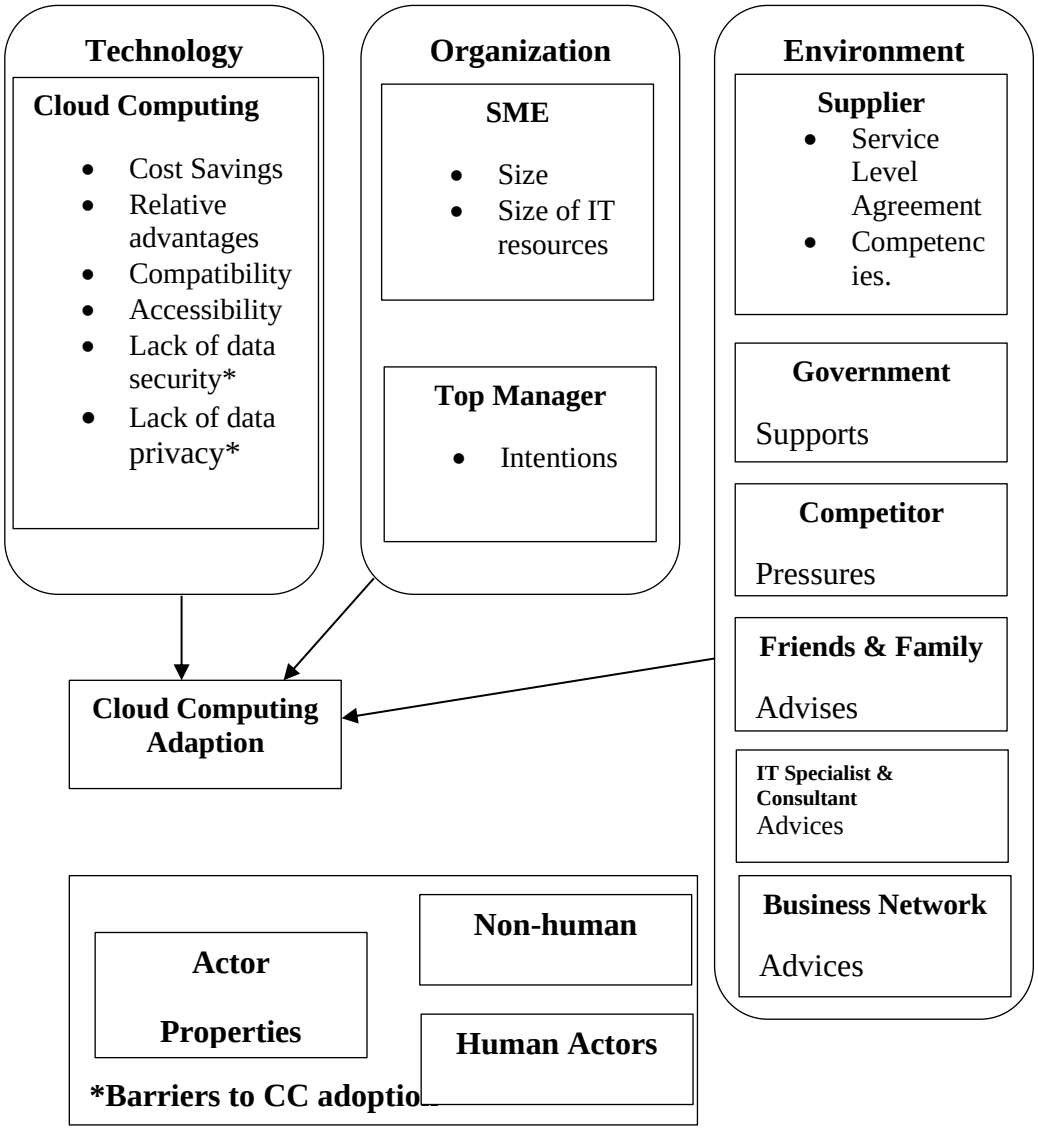

Figure 7: TOE framework for adoption of cloud computing

(Source: Saedi & Iahad, 2013)

There are many reasonable motivations that make the framework of TOE feasible for cloud computing adoption. The cloud computing adoption is a distinct scenario for the acceptance and diffusion of conventional innovation. Usually, third party (cloud service providers) offers cloud computing services to the business firms

(Low, Chen & Wu, 2011). Thus, as compared to other technical innovations, cloud computing technology involves three key players, such as cloud users (client), cloud-based services and cloud service providers. Due to this, there are three main aspects that influence cloud computing adoption in the organizations, including cloud technical characteristics as a technological context, third party characteristics as an environmental context and the firm's characteristics as an organizational context (Ahmadi, Ibrahim & Nilashi, 2015).

According to Low, Chen & Wu (2011), the prior researches have determined only technological determinants to adopt cloud computing model. But due to socio-technical factors' nature in cloud computing services, the environmental and organizational factors are equally important. Therefore, TOE framework is considered more suitable and useful analytical tool to explain all determinants of new technology diffusion in the organization (Hossain & Quaddus, 2011; 239). Furthermore, TOE is more appropriate than other models based on its capacity to apply in the context of both small firms and big corporations (Saedi & Iahad, 2013). Thus, it provides a holistic representation to the users regarding technology adoption, implementation, potential challenges, its influence on value chain process, factors influencing decision to adopt business innovation, post-adoption diffusion among organizations and to create better business capabilities based on new technology.

However, TOE framework is not free from criticism and there are some limitations associated with this model. According to Gangwar, Date & Ramaswamy (2015),

TOE framework is only taxonomy to classify variables and does not represent a well-developed theory or an integrated conceptual framework, thus, a more robust framework is needed to study technological adoption by the organizations. Low, Chen & Wu (2011) also concluded that TOE model has major unclear constructs and TOE framework variables may fluctuate with the context. Therefore, some other variables must be comprised to enrich the particular framework, such as cognitive variables, sociological variables, ability to control IT investment by different channels (e.g. organizational learning), technological readiness (e.g. capabilities of knowledge management), security concerns, skills and experience of professionals, managerial capabilities to manage change, government regulation/policy, culture and technological infrastructure (Hossain & Quaddus, 2011; Gangwar, Date & Ramaswamy, 2015).

Consequently, Lian, Yen & Wang (2014) proposed TOE framework by integrating it with HOT fit (human-organization – technology fit) theory to examine the human factor, which is excluded in the TOE framework but considered as an important factor that creates influence on the company's decision to accept new innovations. Such integrated model is composed of following dimensions:

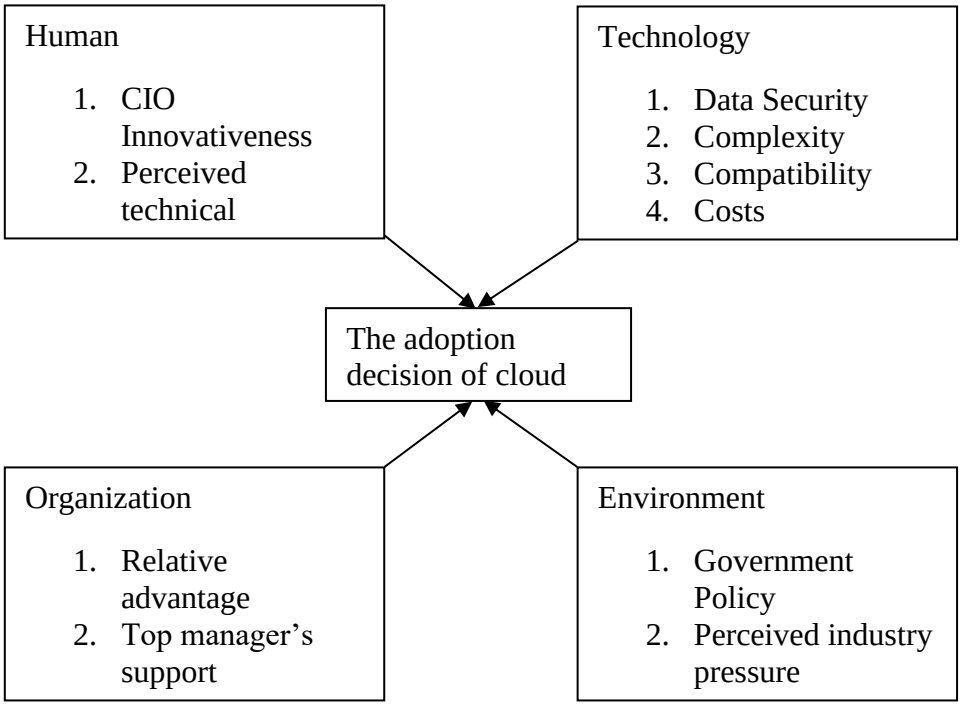

Figure 8: TOE and HOT fit integration

(Source: Lian, Yen & Wang, 2014)

The integration of TOE and HOT elements has made it more valuable in comparison to other models to study adoption of new technology by the users.

Technological context

Technologies that are already used by the company influence its decision to adopt cloud computing, as it determines the limit and scope of technical change that can be accepted by the firm. Also, the technologies that exist in the market but not currently used by the firm influence its adoption decision by demonstrating how the firm can change or develop by accepting novel technologies. There are several changes to the companies brought in by the technology which exists beyond their

boundaries, such as discontinuous, synthetic or incremental changes. There are four point of views based on which technological context can be explained, such as:

Compatibility –Perceived compatibility considers whether the organization and its members' current behavioral patterns, values and experiences are consistent with the novel technology (Peng, Xiong & Yang, 2012). Thus, the previous experience of users reduces the uncertainty level while adopting new technology. An enhanced compatibility in between the adopters' needs and innovation allow the technology's easy integration in the business functions and organization (Alharbi, Atkins & Stanier, 2015). There are several benefits offered by compatibility to adopters. For example, it can result in cost and time reductions as while adopting new technology, the users would not be required to deconstruct costly infrastructure. However, incompatibility in between needs of potential adopters and business process and features of innovation is perceived as the key barrier that affects the adoption of new technology (Nedev, 2014). Therefore, it can be said that the more the technology is found compatible with organizational values, beliefs and existing systems, the more organization probably thinks about its adoption in current business practices.

Complexity – It is referred to the perceived level of difficulty in comprehending and using a new technology. It is about time taken to integrate with cloud infrastructure, perform activities, data transfer efficiency, interface design and system functionality (Gangwar, Date & Ramaswamy, 2015). According to Ahmadi, Ibrahim & Nilashi (2015), the probability of new technology adoption is less if

considered as more difficult to be used by the adopters. It is because implementing new technologies may present several challenges to the organization such as changing their business systems and processes (Alshamaila, Papagiannidis & Li, 2013). Thus, to improve the chances of successful adoption of technology, it must be manageable, user friendly and easy to use and consequently, considered close to the ease of use. But Gangwar, Date & Ramaswamy (2015) considered it as independent construct and stated that complexity is inversely proportional to perceived usefulness and perceived ease of use.

Data security – It is defined as an incident in which an organization loses personal records, information or other sensitive information. Through the storage convergence and computing in a common multi-user environment, the security concern has been increased in cloud computing system (Alshamaila, Papagiannidis & Li, 2013). Also, in the cloud environment, the management of identity still remains a challenge. Consequently, the organizations would be reluctant to implement a solution which lacks credential management and unified identity provisioning (Amini, 2014). Thus, new complexity regarding data security adds while moving to the cloud, which further influences the decision of firm to adopt new technology.

Cost – Cloud computing provides an opportunity for business organizations to enhance their IT related innovations and reduce total cost expenditure. Such capital expenditure comprises fixed cost like initial investment and variable costs like training costs, systems upgrade and maintenance (Amini, 2014). Thus, cloud

computing as an enabler provides cost-effective methods for transforming businesses by re-investing the manner in which services and goods are consumed and sold.

Organizational context

The organizational context is referred to characteristics and resources of firm. These factors significantly affect the failure and success of the companies adopting new technology. The organizational context includes internal factors, which can be controlled by the company and its management, such as:

Resources – It includes both financial and IT resources. According to Ahmadi, Ibrahim & Nilashi (2015), the financial resources are referred to money available for paying installation costs, implementing any subsequent improvements and regular expenses during successful adoption and implementation of new technology. Thus, it can be said that the company's strength and competitiveness in financial resources positively affects the decision to make IT related innovations. On the other side, IT resources comprise the technological resources, which are available in the company to adopt and implement new information system. The technological readiness is relevant to identify the adoption level of innovation in the company and is perceived influential, either as an inhibitor or a facilitator (Hassan et al 2017). Therefore, an existing infrastructure of technology in an organization can create an essential platform on which new technology can be adopted and implemented.

Benefits – According to Hassan et al (2017), cloud computing benefits include ease of data analysis, IT employees' costs, deployment time reduction and universal access. In this context, Low, Chen& Wu (2011) also stated that adoption of cloud computing may improve speed of business communications, enhance effectiveness in inter-organization coordination, improves access to market information utilization and facilitates better communication with the customers. However, Hassan & Ismail (2015) revealed that informational (e.g. improve accuracy of information and ease access to information) and strategic (e.g. supporting companies to build useful link with other firms and develop competitive edge) benefits are achieved by the companies by adopting cloud computing. Also, the information system installation and maintenance with cloud computing are no longer the organizational responsibility, as now they are being managed by the vendors of cloud computing and thus, it reduces the organization's IT related costs (Marston et al 2011). Based on such reasoning, it can be said that cloud computing provides significant benefits to the adopters.

Top managerial support–The support of top management is considered as one of the best predictors for adoption of IT innovation by the companies. Lian, Yen & Wang (2014), also stated that top managerial support in an organization directly influences its decision to adopt cloud computing. It is because resources can be secured by top managers, in order to develop a supportive climate for integrating cloud computing system. In this regard, Gutierrez, Boukrami & Lumsden (2015) inferred that top managers support the companies to avoid opposition to the potential

changes and internal barriers if any. Therefore, the support of top managers is essential for the corporations searching to create a competitive environment, which at the same time offers needed resources to accept cloud service as well.

Relative advantage–It is referred as an extent to which innovation is considered better than the existing idea it supplants. Specifically, while taking decision to adopt cloud computing, the relative advantage is considered as a level to which it is perceived better than other paradigms of computing (Tehrani, 2014). Thus, the particular factor is anticipated to be a positive important factor for taking decision to adopt cloud computing system. Often times, relative advantage creates positive impact on diffusion of innovation. It is reasonable for the companies to weight the overall advantages, which are projected to attain from implementing new technology (Alshamaila, Papagiannidis & Li, 2013). In this context, Lian, Yen & Wang (2014) concluded that cloud computing services that comprise transactions over internet, allow mobilization and generalization of operations and thus, complement for and substitute ERP software. Amini (2014) also inferred that innovations that have an unambiguous and clear benefits in producing operational (e.g. reduce costs of operations) and strategic (e.g. increase in the sales volume) effectiveness have high impetus to be accepted by the adopters. Moreover, if the new technology's benefits surpass existing processes and practices then positively affect its adoption decision. Therefore, the likeliness of new technology adoption increases when the companies perceive relative benefits of such innovation. But Lian, Yen & Wang (2014) given that the organizations might not be confident to

implement cloud computing system, as it is relatively new concept. Consequently, the users or adopters take long time to comprehend and adopt new technology in their operations.

Environmental context

Environmental context is defined as external setting in which the company undertakes its business operations. The factors included in environmental context can be either enablers or constraints for adopting innovation (Hassan et al, 2017). Two main environmental aspects covered in the following study are government support and industry pressure. Baker (2012) believes that adoption level is more in the industries that grow rapidly, while innovation is not clear in declining or mature sectors. Also, the government's impact on process of innovation is although not clear but its regulation can either inhibit or support the new technology adoption.

Government policy–The regulations of country's government can have either detrimental or beneficial effect on the organization's IT related innovations. When new constraints are imposed by the government on industry, such as requiring devices to be used by energy firms for pollution control, then in such case, it is mandatory for the companies to drive innovation (Baker, 2012). On the other side, stringent testing and safety requirements can impede innovative practices of several industries (Alharbi, Atkins & Stanier, 2015). For instance, innovation cost in agriculture sector is quite high, as new corporations must be licensed and patented. Also, innovation is more complex in the construction sector where stringent test is

required before using new materials. One more example presents in the banking sector, where high requirements of privacy may prevent banking institutions to introduce new account access methods for their customers. Thus, in such manner the regulations or policies of government can either discourage or encourage innovative practices, depending on the situation.

Perceived industry pressure – It is referred as the pressure faced by the companies from their rivals present in the industry. The intense competitive pressure within the organization's industry is considered as the most significant determinant to accept new innovations (Oliveira, Thomas & Espadanal, 2014). Low, Chen & Wu (2011) also stated that companies which feel pressure of rapid technical changes and external pressure resultant from these changes, be likely to adopt innovations to maintain their long-term competitiveness. The industry's competitive pressure has been perceived to influence decision to adopt innovation positively, specifically when it is strategically needed to compete with the strong rivals. Further, Gangwar, Date & Ramaswamy (2015) determined from their study that the companies, which implement advance stage of cloud computing tend to get advantages in terms of high operational efficiency, market visibility and more appropriate data collection.

Human context

The below are some important human dimensions that must be considered by the companies tend to implement new technology, as these factors considerably influence the level of IT adoption in the business:

CIO innovativeness–The Chief Innovation Officer's (CIO) innovativeness greatly affects the decision of accepting cloud computing technology in the organization. It is because the CIO's role is changing from merely IT operation managers to a strategic leader of business who can support well in gaining competitive advantage by the companies (Lian, Yen & Wang, 2014). According to Malladi& Krishnan (2012), the responsibilities of CIO's to effectively interact with customers and other executives of the organisation and their active involvement in the process of product development are becoming the main determinants to drive and adopt innovative practices in business. It is due to the reason that main antecedents of CIO are business competencies and high levels of business technology, which in turn greatly enhance the capability of firm to assimilate IT-related innovations.

Perceived technical competence – Ahmadi, Ibrahim & Nilashi (2015) identified that to use new and updated technology; the company's staff should hold proper knowledge of new IT practices. Also, it has been determined by Alharbi, Atkins & Stanier (2015) that employees' IS (information system) knowledge and the company's information intensity are the main determinants that affect the firm's decision to accept new technology. Thus, it can be said that if existing employees have adequate skills and sufficient knowledge to adopt IT related innovations, then the organizations can confidently initiate innovation process.

Thus, by analyzing the above integrated TOE and HOT-fit model, it can be said that among the proposed dimensions which affect the decision of firms to adopt

innovations, the most significant dimension is technology followed by human, organizational and environmental aspects. Also, the framework illustrates that great differences exists in data security, CIO innovativeness, top managerial support, compatibility, perceived industry pressure and adequate resources across different adopting groups.

2.9 The important factors that affect cloud computing decisions

By analyzing the previous models and reviewing existing literature, the following variables are considered as the most important to be investigated throughout this study:

Perceived ease of use

Perceived ease of use is considered as an extent to which a person believes that utilizing a particular technology or system would be free of mental and physical effort. Also, it is equal to self-efficacy, which is referred to 'judgements about how effectively one can implement required course of actions, in order to deal with potential situations (Davis, 1989). It is fact that information technology is persistent in the contemporary business world. Consequently, most of the people at some point use information technologies or computer in some or other form. Though a user has little or no knowledge regarding any new system's ease of use, he/she may have certainly a well-formed sense for his/her abilities to use computer and information

technologies in general. Such general computer self-efficacy notions can offer an anchor to judge an unfamiliar and new system's usability (Palos-Sanchez, Arenas-Marquez & Aguayo-Camacho, 2017).

In the above context, Hasan et al (2015; 845) inferred that in the modern business firms, employees generally perform their job outside the physical location of office and therefore, the use of cloud computing technology allow them to access their information through mobile phones and any other tool which facilitates them in doing so. The cloud computing technique supports an individual to access their work at any time and from anywhere with any portable device by reducing administrative cost to perform the business activities (Ma, Cui & Stojmenovic, 2012). Thus, less powerful devices (e.g. netbooks, smartphones) are effective in making most of the organization's backend IT systems through a simple web-based interface. Also, it can be said that the perceive ease of use is an essential antecedent, as it plays a main role in determining users' acceptance with the novel technology. The computer self-efficacy can be utilized to predict subsequent acceptance and perceptions of users and new systems utilization within the particular group of target users in the organizations.

Moreover, by implementing cloud computing system, the companies are not required to maintain and administer their IT infrastructure each year, which radically reduces IT operations costs. Also, pay-as-you-use rented services are offered by cloud computing which lead to adjusting the usage level as per the organization's current needs (Gangwar, Date & Ramaswamy, 2015; 7). Such type of facilities

increases the new technology's ease of use and influence the users' decision positively, to use innovative techniques in their operations. As discussed in the TAM model, perceived ease of use also considerably influences the new technology's perceived usefulness, as technologies which can be used easily are considered as more useful by the adopters.

H2. Perceived ease of use has a direct effect on behavioral intention to use

Perceived usefulness

According to Davis (1989), perceived usefulness is considered as a level to which user perceived that a particular technology will improve his/her performance at the job. The perceived usefulness is positively affected by relative advantages of technological context. The mobility provides users a facility to access data and perform their job from anywhere, by having an internet connection and access to computer. Also, the users are not required to own a computer to use cloud computing services. Thus, perceived usefulness creates positive effects on the behavioral intention and attitude of users by saving their money and time. In addition to this, compatibility also plays significant role in perceived usefulness. It is perceived by Gangwar, Date & Ramaswamy (2015) that more the platforms of cloud computing are align with internet, the more the organizations will be able to obtain cloud computing benefits and more will be the possibility to reduce uncertainty degree within the users of new technology. As a consequence, while adopting cloud

computing model, it is required to comprehend whether the potential technology is compatible with existing technological architecture of the organization.

Besides above, users' training also improves the new technology's perceived usefulness. Training is defined as an extent to which organization instructs its employees to use a tool in terms of quantity and quality (Wahsh & Dhillon, 2015; 17828). As cloud computing is a complex system of information technology, the companies' needs to educate and train their employees before adopting the particular system in their business operations. An effective training and acknowledgment programmer to use new technology reduces stress and anxiety among employees to adopt cloud computing system and provides them better understanding and motivation about its uses and benefits into their operations (Gangwar, Date & Ramaswamy, 2015; 10). Therefore, training as a method used by the companies to reduce ambiguity and support staff members in developing their knowledge for the new technology's effective use in their current and future operations as well.

Furthermore, there is a notable path of perceived availability to perceived usefulness. According to Shin (2013), the cloud computing setting provides users with anywhere and anytime content/information/service access. Such ideal vision provides perceived availability to the users and they consider it as criteria of cloud technology's usefulness or benefit. Also, users through perceived availability feel psychological readiness of accessing computing resources anytime and from anywhere. Thus, it can be said that cloud computing system is considered as more useful by the users because of its perceived availability on a ubiquitous basis.

H3. Perceived usefulness has a direct effect on behavioral intention to use

Perceived risk

Risks in cloud computing are mainly about the security and privacy concerns (Zeqiri, Aliu, Kostanica, & Prenaj, 2017). According to Xiao & Xiao (2013), data security is the most critical barrier to adopt cloud computing, as it go along with several other significant challenges including privacy, trust, legal matters and compliance. As in the cloud computing mechanism, data are scattered in different locations of machines like PCs, mobile phones, servers and storage devices, the problem of data security becomes more serious. The study has identified several aspects of security and privacy concerns in cloud computing environment such as accountability, confidentiality, preservability of privacy due to loss of physical control on data, integrity due to manipulation of data or dishonest computation on remote servers, and availability issues of bandwidth and pricings (Xiao & Xiao, 2013).

In the above context, Sun et al (2014) also mentioned that privacy issues in cloud environment means the inefficacy of cloud mechanism to prevent potential behavior of users to interfere other's information and data while accessing sensitive data. There are four different categories of privacy issues pertaining to different cloud settings:

- To have mechanisms to control the data when storing and processing in cloud so as to prevent immoral use, theft, and unauthorized access or reuse for another purpose;
- To ensure reliable and controlled data replications so that unauthorized information amendment, leakage and data loss can be avoided;
- To assign responsibility to ensure legal obligations towards privacy of personal, sensitive or confidential information;
- To identify and ascertain the degree of involvement of cloud subcontractors in processing private information (Sun et al 2014).

Also, Yu, Sen, & Jeong (2013) addressed several challenges regarding security and privacy in cloud computing. The research pointed out particularly six fields of cloud computing settings in which software and equipment are subject to significant security and privacy risks. Such fields are data at rest in storage units or data servers, data in transit for accessing or storing information, authentication of users of data or applications and processes that have authorized access, strong separation between distinct customers to whom the data belongs to, legal / regulatory issues of cloud and efficient response to incident. Therefore, cloud computing adoption issues for security and privacy aspects are mostly old problems in new environment.

H6. Perceived risk has a negative direct effect on behavioral intention to use

Compatibility

This variable came from diffusion of innovation theory. Notion of compatibility means: “the degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters” (Agarwal & Prasad, 1997). two factors determine the the compatibility: the internal organizational infrastructure (e.g.: current values organization’s strategy and needs) and internal information systems environment (e.g.: IT infrastructure)). historically, in new technology adoptions it showed that first adopters tend to emphasize on the expected benefits of the new technology and on the compatibility between the new technology and the current organizational environment and infrastructure (Lin & Chen, 2012).

H4. Compatibility has a direct effect on behavioral intention to use

Cost

Cost is very important factor when the organization decide to adopt a new technology. Many researches has indicated that TAM need to be integrated with other variables in order to give better adoption model (Wu & Wang, 2005). Behavioural decision theory emphasized that the cost-benefit pattern is significant to both perceived usefulness and ease of use in the decision to adopt a new technology (Wu & Wang, 2005).

H5. Cost has a negative direct effect on behavioral intention to use.

Cloud computing awareness

Technological awareness “keep abreast of available technology , understand applicability and limitations of a technology to the work of the office , actively seeks to apply technology to appropriate tasks , shows willingness to learn new technology ” (glosbe.com, "technological awareness in English", 2019).Tarmidi, Rasid, Alrazi, & Roni, (2014) assured that the level of awareness is an important factor in adoption of cloud computing technology. So, when the level of the awareness increases, then adoption and using level of cloud computing will increase as well Pikkarainen et al. (2004). a study by Bagish (2014) which conducted on a student showed low level of awareness about cloud computing because of not enough necessary resources.

H1. Cloud computing awareness to use has a direct effect on Behavioral intension to use

CHAPTER 3

THE METHODOLOGY

Data collection and analysis has done in line with research model presented herein the paper. Though it would be a systematic procedure to ensure all techniques address research problem as well as hypotheses outlined for research. Also, a criterion to answer questions in research undertaking focused at, in a simple comprehensive atmosphere to easily be understood by decision makers in Jordan Investments sector at the national level.

This study therefore presents the following intended methods to be used in primary data collection. They are the methods identified as the best methodology in the course of data collection by the fact that data collection should be of high accuracy, as well as address significance scope of study.

Interview sessions with IT specialists, cloud solutions architects, computer systems engineers, and CIOs. Nearly 220 questionnaires were supplied to IT employees.

In accordance with the purpose of our study, quantitative research methods were chosen to meet objectives of this study. In particular questionnaire, based the study model and by using previously tested and validated instruments, was used to get the IT employee s ‘responses regarding the overall intension to use cloud computing technology and the same data is also used for validation of the model using statistical analysis.

After all these methods, mainstreaming of data from all primary sources was on course. Badges shall be provided to ensure right people are on the ground conducting research. (McQuarrie, 2011)

3.1 Secondary Data Collection Methods

Just as it's the case with primary data collection, here secondary data collection again employs not less than or limited to single data collection technique. Almost four data collection techniques shall be used to authenticate legitimacy and counter track effect of data variation errors. Later on in this methodology, we shall also realize sample size we'll be using shall offer a masking effect to reduce intensity of data fluctuations and tendency of inaccurate variations with regard to data analysis model we shall be using. The methods are outlined as follows;

Obtain internal data of test organizations in form of databases, past analyzed data from previous researches, and individual organizations sales reports.

Appeal to the government of Jordan to provide government statistics on the uptake of cloud computing technology by resident business organizations of the place. If possible, we shall request for more refined data for a period lasting not less than a decade.

Acquire Internet resources in form of research data reports compiled on cloud computing technology, articles from licensed newspapers and magazines, to guide and relate accuracy of data analysis undertaken.

This will be a simple exercise compared to primary data acquisition as most of the secondary data is readily available. (Stewart & Kamins, 1998)

3.2 Target Population

When researchers design their studies, they have to ensure that their work will accurately reflect the population in which they are interested. A population is a collection of people, objects, countries, etc., that share a common characteristic of interest.

The target population for this study includes IT employees in Jordanian business organizations.

3.3 Sample Frame

Once a target population is defined, a sampling frame can be created, which is the set of cases from which the sample is chosen. In this study the sample frame are IT employees in Jordanian business organizations.

Focusing at the model data research and analysis is used in, there are 6 variables.

Perceived Ease of Use

Perceived usefulness

Compatibility

Cloud computing awareness

Perceived risk, and

Cost

This can be statistically represented as:

$$\mathbf{CC\_IU_i = \beta_o + \beta_1\, PEOU_i + \beta_2\, PU_i + \beta_3\, CP_i + \beta_4}\, CW_i + \mathbf{\beta_5\, PR_i + \beta_6\, CC_i} + \varepsilon_i$$

In the equation, CC_IU*i* is the intension to use cloud computing which is the dependent variable, PEOU*i* is the Perceived Ease of Use, PU*i* is Perceived usefulness, CP*i* is compatibility, CC is the cost, PR is perceived risk and CW*i* is cloud computing awareness which are independent variables. Furthermore, β_o is constant term while β1 to β6 are parameters to be estimated from the independent variables used in the model and ε_i is error term.

Dependent Variables		
CC_IU	Behavioral intension to use	Ordinal Variable Strongly disagree= 1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5
Independent Variables		
Cloud Computing Adoption Model Constructs		
PEOU	The extent to which the user of cloud computing thinks it is easy	Ordinal Variable Strongly disagree= 1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5
CP	the degree to which an innovation is perceived as being consistent with the existing values, needs, and	Ordinal Variable Strongly disagree= 1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5

	past experiences of potential adopters	
PU	The level of usefulness of cloud computing perceived by the user	Ordinal Variable Strongly disagree= 1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5
PR	The level of security and privacy assured by the cloud computing as perceived by the user	Ordinal Variable Strongly disagree= 1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5
CC	The cost of adoption of cloud computing	Ordinal Variable Strongly disagree= 1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5
CW	User's level of awareness of cloud computing	Ordinal Variable Strongly disagree= 1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5

These variables are more of factors affecting adoption of cloud computing technology in Jordan business organizations. Techniques and procedures set forth for data collection and analysis, are sure enough to explain, to which extend does each variable exert effect or influence on adoption of cloud computing technology. It's at this point, data collected by specific methodology shall dictate how each one of them unveils the truth of the matter in numerical values; how they influence uptake of cloud computing technology.

Researchers therefore ensured variables under this study in the model are presented in research techniques before materials are taken to respondents.

3.4 Ideas for Sampling Primary Data:

As it is clear, through sampling the researcher is able to obtain opinions of a big group of individuals or businesses by only isolating a small fraction of the population as a sample. This may be tricky as there are dozens of sampling techniques. Wrong selection of techniques used in population sampling, may lead to viral data. The researchers, thus advised to take caution before performing any sampling.

With respect to the topic and complexity of research whic is executed, it is desired to use the following sampling techniques for our primary data. (Green & Srinivasan, 1978).

Cluster Sampling

It's a quick and easy to use technique as it directly hit at the target organizations.

Convenience Sampling

Preferred as it allows individual respondents to volunteer in providing data. There's high level of authenticity as individuals who volunteer are sure of information, unless biased by correspondent volunteers. Large quantities of data are collected and that's why it's termed convenience sampling.

Systematic Sampling

This is the most convenient and productive sampling technique for primary data. It makes use of probability to establish approximate sample size from the whole population. A situation that allows data sample to be wide spread. Thus, covering a wide scope of population.

3.5 The Questionnaire

The data was collected using 23-item quantitative scale which assessed the factors that affect the decision making for using cloud computing services. The questionnaire was based on seven contracts; Cloud Computing Awareness, Perceived Risk, Cost, Compatibility, Perceived usefulness, Perceived Ease of Use and Behavioral Intentions to Use. The scale reliability was 0.74 and among the constructs, Perceived Risk and Perceived Ease of Use have High reliability, Cost, Perceived Usefulness and Behavioral Intensions to Use have Above Average reliability while the subscales Cloud Computing Awareness and Compatibility have average reliability.

3.6 Data Analysis

Research methodology wouldn't be complete without methodology data analysis. It's at this point now presented forth regression analysis. It's a method, or model is used to analyse data. As it is noted from its definition as a set of statistical processes used to estimate relationships between variables, the study have factors that affect cloud computing technology intension to use as dependent variables, while Perceived Ease of Use , Perceived usefulness , Compatibility , Cloud computing awareness ,Perceived risk, and Cost will remain to be independent variables. From

there, we shall therefore be ready to analyse data and confirm or disapprove formulated hypotheses.

Since the data that collected for this study is quantitative therefore quantitative data analysis techniques would be applied. Moreover, different statistical measures would be calculated depending on the nature of the analysis. If the analysis addresses the system evaluation, one of the research questions of this study, then descriptive statistics would be applied. For model validation, statistical measures for hypothesis testing calculated.

The test of the structural model includes simple linear regression and multiple linear regression as well as ANOVA and MANAOVA scheffe test for all domain is measured

CHAPTER 4

EXPERIMENTS AND EVALUATION

The data was collected using 23-item quantitative scale which assessed the factors that affect the decision making for adopting cloud computing services. The data was analyzed using Statistical Package for Social Sciences (SPSS). A number of analyses were used to analyze the data that included; "Descriptive Analysis, Reliability analysis, Regression analysis, MANOVA, ANOVA and Sceffe."

4.1. Demographic characteristics

The questionnaire included questions related to demographic characteristics such as age, gender and position in organization. Summary of those characteristics is given in the following tables.

Table 1: Demographic Characteristics

		Frequency	**Percent**
Age	Less than 30	57	32.9
	30-39	66	37.7
	More than 39	52	29.7
	Total	**175**	**100**
Experience	Less than 5 years	41	23.4
	5-10 years	69	39.4
	More than 10 years	65	37.1
	Total	**175**	**100**
Gender	male	91	52
	female	84	48
	Total	**175**	**100**
Position	top level	46	52.2
	middle level	69	35.2
	non-management	60	30.6
	Total	**175**	**100**
Size Of Organization	Small	46	26.2
	Medium	66	37.7
	Large	63	36.1
	Total	**175**	**100**

Table 1 displays age of the participants; the most number of participants were from age 30-39. And the least number of participants were from the age range more than 39. There were 175 participants and no data values were missing. Regarding gender of the participants, there were more male participants with the percentage 46.4% and fewer female participants with the percentage 42.9%.

Position of employees in their respective organization is also mentioned. The greatest number of participants from middle level of management and the least of participants were from top level of management. This means that the study results can be generalized on population of Middle Level Management positions.

The size of organizations is also mentioned in the table1 in which the participants have been working. The greatest number of participants were from Medium size organization. A medium size organization is the one that has 50-250 employees.

4.2. Reliability of scale

Reliability of the scale reflects the extent to which the measure of a scale is dependable or consistent. To assess the reliability of the scale used in this study, reliability analysis was used. Following are the results of reliability analysis.

Table 2: Case Processing Summary

		N	%
Cases	**Valid**	175	100.0
	Excluded[a]	0	0.0
	Total	175	100.0

Table 3: Reliability of Scale

No	**Domain**	**Alpha**	**Item No**
1	Cloud Computing Awareness	6.73	3
2	Perceived Risk	8.46	4
3	Cost	7.54	3
4	Compatibility	6.98	3
5	Perceived usefulness	7.87	3
6	Perceived Ease of Use	8.23	3
7	Behavioural Intentions to Use	7.16	4
Tool of study		**0.74**	**23**

In table 2 and 3, it is mentioned that the questionnaire had reliability value of Cronbach's Alpha=0.74 which reflects Good reliability of scale. This reflects that

the model is good fit for data. Among the subscales, Perceived Risk and Perceived Ease of Use have High reliability, Cost, Perceived Usefulness and Behavioral Intensions to Use have Above Average reliability while the subscales Cloud Computing Awareness and Compatibility have average reliability.

Table 4: Means and Standard Deviation for Each Domain of Study and Total Means of Them

		Mean	**Std. Deviation**	**Rank**	**Agreement Degree**
1	Cloud Computing Awareness	9.9200	2.19571	7	High
2	Perceived Risk	12.1886	2.90934	3	High
3	Cost	8.6000	2.86477	4	High
4	Compatibility	8.8629	2.34975	6	High
5	Perceived usefulness	8.9371	2.41441	5	High
6	Ease of Use	7.8229	3.18357	2	High
7	Intensions to Use	8.3714	3.77747	1	High

Table 4 gives mean value and standard deviation of the questionnaire. The values show that the subscale with the highest mean value was of perceived risk with the value 12.1886. While the subscale with the lowest mean value was of ease of use with the value 7.8229. The subscale with the highest standard deviation was of

intensions to use with the value of 3.77747, while the subscale with the lowest standard deviation was of compatibility with the value of 2.34975.

Table 5: Cloud Computing Awareness

	Minimum	**Maximum**	**Mean**	**Std. Deviation**
I have received enough information about cloud computing *	1.00	5.00	3.5600	1.22033
I have received enough information about benefits of using cloud computing *	1.00	5.00	3.1486	1.48583
I have enough information about services that are offered through cloud computing	1.00	5.00	3.2114	1.31564

In table 5 mean value and standard deviation of question items from the subscale Cloud Computing Awareness are given. The values show that the highest response to question items received was Highly Agreed which was of the value 5. The item with the highest Mean value was item 1 with the value 3.56 from this subscale and the item 2 was of the least Mean Value with 3.148. From the question items, the second item was of the highest value of Standard Deviation with the value 1.485 while the item with the least Standard Deviation Value of item 1 with 1.315.

Table 6: Perceived Risk

	Minimum	Maximum	Mean	Std. Deviation
I think using cloud computing in monetary transactions has potential risk *	1.00	5.00	3.1143	1.45767
I think using cloud computing in merchandise services has potential risk *	1.00	5.00	3.0800	1.40786
I think using cloud computing in product purchases has potential risk *	1.00	5.00	3.1086	1.27066
I think using cloud computing puts my privacy at risk *	1.00	5.00	2.8857	1.33845
Valid N (listwise)				

In table 6 the mean value and standard deviation of question items from the subscale Perceived Risk are given. The values show that the highest response to question items received was Highly Agreed which was of the value 5. The item with the highest Mean value was item 1 with the value 3.114 from this subscale and the item 4 was of the least Mean Value with 2.885. From the question items, the first item was of the highest value of Standard Deviation with the value 1.457 while the item with the least Standard Deviation Value of item 3 with 1.270.

Table 7: Cost

	Minimum	Maximum	Mean	Std. Deviation
I think the equipment cost is expensive of using cloud computing to offer integrated services *	1.00	6.00	3.0743	1.43446
I think the access cost is expensive of using cloud computing architecture of my organization *	1.00	5.00	2.7486	1.47574
I think the transaction fee is expensive of using cloud computing *	1.00	5.00	2.7771	1.45489

Table 7 gives the mean value and standard deviation of question items from the subscale Cost. The values show that the highest response to question items received was Highly Agreed which was of the value 5. The item with the highest Mean value was item 1 with the value 3.074 from this subscale and the item 3 was of the least Mean Value with 2.777. From the question items, item 2 was of the highest value of Standard Deviation with the value 1.454 while the item with the least Standard Deviation Value of item 1 with 1.434.

Table 8: Compatibility

	Minimum	Maximum	Mean	Std. Deviation
Using cloud computing is compatible with most aspects of my tasks *	1.00	5.00	3.0286	1.30176
Using cloud computing fits my work *	1.00	5.00	3.0114	1.27301
Using cloud computing fits well with the way I like to engage in doing my work *	1.00	5.00	2.8229	1.38030

In table 8 the mean value and standard deviation of question items from the subscale Compatibility are given. The values show that the highest response to question items received was Highly Agreed which was of the value 5. The item with the highest Mean value was item 1 with the value 3.028 from this subscale and the item 3 was of the least Mean Value with 2.822. From the question items, item 2 was of the highest value of Standard Deviation with the value 1.273 while the item with the least Standard Deviation Value of item 1 with 1.380.

Table 9: Perceived Usefulness

	Minimum	Maximum	Mean	Std. Deviation
I think Using cloud computing allow me to manage business operation efficiently *	1.00	5.00	3.0057	1.30206
I think Using cloud computing allow me to increase business productivity *	1.00	5.00	2.9714	1.28845
I think Using cloud computing enables me to do my organizational task more quickly *	1.00	5.00	2.9600	1.34061

Table 9 gives the mean value and standard deviation of question items from the subscale Perceived usefulness. The values show that the highest response to question items received was Highly Agreed which was of the value 5. The item with the highest Mean value was item 1 with the value 3.005 from this subscale and the item 3 was of the least Mean Value with 2.960. From the question items, item 3 was of the highest value of Standard Deviation with the value 1.340 while the item with the least Standard Deviation Value of item 2 with 1.340.

4.3. Regression

To assess the effect of factors that are likely to affect decision making in using cloud computing, Regression analysis was used. The study hypothesized effects of different factors which are stated in table 10.

Table 10 Regression

	Independent variable	"t" value	"t" sig	B	R	R^2	"f" value	"f" sig
1	Cloud Computing awareness	1.655	.100	.600	0.737	0.642	110.736	0.325
2	Perceived ease of use	0.761	0.001	0.021	0.684	0.743	110.823	0.000*
3	Perceived usefulness	0.987	0.000	0.029	0.579	0.637	112.464	0.001*
4	Compatibility	0.001	0.975	0.034	0.639	0.742	110.346	0.253
5	Cost	-15.131	0.00	-0.540	0.755	0.570	228.953	0.00*
6	Perceived risk	-14.895	0.00	-0.492	0.749	0.561	220.799	0.00*

In table 10, values for each hypothesis are given which illustrate effect of each independent variable on dependent variables.

H1. Cloud computing awareness to use has a direct effect on behavioral intension to use.

Table 10 shows that there is no statistically significant effect at significant level ($\alpha \leq 0.05$) of Cloud computing awareness on behavioral intension to use, where "f" value reached (110.736) by statistically insignificant (0.325). (R) Value reached (0.737), and (R^2) value reached (0.642).

H2. Perceived ease of use has a direct effect on behavioral intention to use.

There is significant effect of Perceived ease of use on behavioral intension to use at significant level ($\alpha \leq 0.05$), where "f" value reached (110.823) by statistically insignificant (0.00). (R) Value reached (0.684), and (R^2) value reached (0.743).

H3. Perceived usefulness has a direct effect on behavioral intention to use

There is statistically significant effect at significant level ($\alpha \leq 0.05$) of Perceived usefulness of use on behavioral intension to use, where "f" value reached (112.8464) by statistically insignificant (0.01). (R) Value reached (0.579), and (R^2) value reached (0.637).

H4. Compatibility has a direct effect on behavioral intention to use

There is no statistically significant effect at significant level ($\alpha \leq 0.05$) of Compatibility on behavioral intension to use, where "f" value reached (110.346) by statistically insignificant (0.253). (R) Value reached (0.639), and (R^2) value reached (0.742).

H5. Cost has a negative direct effect on behavioral intention to use.

There is statistically significant effect of Cost on behavioral intention to use at significant level ($\alpha \leq 0.05$), where "f" value reached (228.953) by statistically significant (0.00). (R) Value reached (0.755), and (R^2) value reached (0.570).

H6. Perceived risk has a negative direct effect on behavioral intention to use

There is statistically significant effect at significant level ($\alpha \leq 0.05$) of Perceived risk on behavioral intension to use, where "f" value reached (220.799) by statistically significant f sig (0.00). (R) Value reached (0.749), and (R^2) value reached (0.561).

4.3.1 Multiple Regression:

The model can be represented in this equation:

$$\mathbf{CC\_IU}_i = \beta_0 + \beta_1 \mathbf{PEOU}_i + \beta_2 \mathbf{PU}_i + \beta_3 \mathbf{CP}_i + \beta_4 \mathrm{CW}_i + \beta_5 \mathbf{PR}_i + \beta_6 \mathbf{CC}_i + \varepsilon_i$$

Following table shows the result of multiple regression analysis. Cloud Computing intension to use is the dependent variable while Cloud Computing Awareness,

Perceived Risk, Cost, Compatibility, Perceived usefulness and Perceived Ease of Use are independent variables.

Table 11: Multiple Regression Analysis

Variable/Model	**B**	**SE**	**B**
Cloud Computing Awareness	0.34	0.21	.100
Perceived Risk	0.08	0.25	0.05*
Cost	0.74	0.18	0.03*
Compatibility	0.07	0.22	0.76
Perceived usefulness	0.17	0.19	0.01*
Perceived Ease of Use	0.62	0.23	0.02*
Behavioral Intentions to Use	0.20	0.18	0.768

The results of multiple linear regression showed that perceived ease of use , perceived usefulness , cost , perceived risk were statistically significant, while compatibility and cloud computing awareness were found not to be statistically significant

4.4. ANOVA

To assess the difference between multiple groups ANOVA was used. As the participants involved in this study were from three different groups with respect to their age, positions in organizations and size of organization, ANOVA was used.

Table 12: Compatibility

Domain			Mean	Standard Deviation
Compatibility	**Age**	Less than 30	7.84	2.30
		30-39	8.81	2.69
		More than 39	9.01	2.10
	Experience	Less than 5 years	8.82	2.47
		5-10 years	8.84	2.33
		More than 10 years	8.90	2.31
	Position	top level	8.69	2.82
		middle level	8.72	2.27
		non-management	9.15	2.02
	Size Of Organization	Small	8.34	2.47
		Medium	9.27	2.02
		Large	8.80	2.51

Table 13 Perceived Usefulness

Domain			Mean	Standard Deviation
Perceived Usefulness	**Age**	Less than 30	8.61	2.43
		30-39	8.85	2.60
		More than 39	9.02	2.31
	Experience	Less than 5 years	9.12	2.68
		5-10 years	8.78	2.24
		More than 10 years	8.98	2.43
	Position	top level	9.00	2.35
		middle level	8.76	2.52
		non-management	9.08	2.35
	Size Of Organization	Small	8.69	2.42
		Medium	9.00	2.55
		Large	9.04	2.28

Table 14: Ease of Use

Domain			Mean	Standard Deviation
Ease of Use	**Age**	Less than 30	9.00	2.30
		30-39	7.49	3.20
		More than 39	7.87	3.25
	Experience	Less than 5 years	8.19	3.01
		5-10 years	8.15	3.25
		More than 10 years	7.23	3.16
	Position	top level	8.06	3.54
		middle level	7.50	3.08
		non-management	8.00	3.01
	Size Of Organization	Small	6.89	2.78
		Medium	8.50	3.43
		Large	7.79	3.05

Table 15: Intensions to Use

Domain			Mean	Standard Deviation
Intensions to Use	**Age**	Less than 30	10.23	4.79
		30-39	8.77	3.73
		More than 39	7.89	3.59
	Experience	Less than 5 years	8.51	3.88
		5-10 years	8.39	3.66
		More than 10 years	8.26	3.88
	Position	top level	8.67	3.89
		middle level	8.40	3.65
		non-management	8.10	3.86
	Size Of Organization	Small	7.52	3.72
		Medium	8.60	4.00
		Large	8.74	3.52

Table 16: Perceived Risk

Domain			Mean	Standard Deviation
Perceived Risk	**Age**	Less than 30	9.61	6.50
		30-39	11.95	5.97
		More than 39	12.31	5.48
	Experience	Less than 5 years	11.04	5.90
		5-10 years	12.82	5.68
		More than 10 years	11.69	5.67
	Position	top level	12.08	5.84
		middle level	11.49	5.87
		non-management	12.48	5.56
	Size Of Organization	Small	12.52	5.35
		Medium	11.87	5.77
		Large	11.71	6.04

Table 17: Cost

Domain			Mean	Standard Deviation
Cost	**Age**	Less than 30	9.92	5.76
		30-39	12.34	5.51
		More than 39	12.65	5.03
	Experience	Less than 5 years	11.60	5.50
		5-10 years	13.07	5.21
		More than 10 years	12.03	5.18
	Position	top level	12.43	5.36
		middle level	11.88	5.40
		non-management	12.80	5.11
	Size Of Organization	Small	12.91	4.95
		Medium	12.22	5.29
		Large	12.04	5.53

Table 18: Cloud Computing Awareness

Domain			Mean	Standard Deviation
Cloud Computing Awareness	**Age**	Less than 30	9.15	1.86
		30-39	10.14	2.19
		More than 39	9.88	2.22
	Experience	Less than 5 years	10.12	2.23
		5-10 years	9.56	2.17
		More than 10 years	10.16	2.17
	Position	top level	9.76	2.26
		middle level	10.17	1.94
		non-management	9.75	2.41
	Size Of Organization	Small	10.15	2.08
		Medium	10.21	2.10
		Large	9.44	2.31

The above tables shows that there are variance between demographic characteristics categories means therefore, multiple analysis of variance (MANOVA) was applied. Following are details and result of that analysis.

4.5. MANOVA

ANOVA is used to assess differences between means of multiple groups while Multivariate analysis of variance (MANOVA) is used to assess the difference in two or more means vectors. The purpose of using MANOVA is to determine main effects and interactions of independent variables. MANOVA also determines the importance of dependent variable. Following are the results:

Table 19: MANOVA Test

Source	**Dependent Variable**	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Age	**Cloud Computing Awareness**	3.081	2	1.540	.312	.732
	Compatibility	34.750	2	17.375	3.973	.021
	Perceived Usefulness	2.908	2	1.454	.261	.771
	Ease Of Use	41.077	2	20.538	2.072	.130
	Intensions To Use	33.561	2	16.781	1.178	.311
	Perceived Risk	23.818	2	11.909	.359	.699
	Cost	21.615	2	10.808	.390	.678
Experience	**Cloud Computing Awareness**	3.591	2	1.796	.364	.696
	Compatibility	1.602	2	.801	.183	.833
	Perceived Usefulness	1.259	2	.630	.113	.893
	Ease Of Use	19.099	2	9.550	.964	.385
	Intensions To Use	.673	2	.337	.024	.977
	Perceived Risk	37.837	2	18.918	.570	.567
	Cost	27.300	2	13.650	.493	.612
Position	**Cloud Computing Awareness**	1.311	2	.656	.133	.876
	Compatibility	15.549	2	7.774	1.777	.174
	Perceived Usefulness	15.316	2	7.658	1.373	.257
	Ease Of Use	7.734	2	3.867	.390	.678
	Intensions To Use	20.340	2	10.170	.714	.492

	Perceived Risk	6.314	2	3.157	.095	.909
	Cost	7.168	2	3.584	.129	.879
Organization Size	**Cloud Computing Awareness**	14.097	2	7.049	1.429	.244
	Compatibility	2.421	2	1.210	.277	.759
	Perceived Usefulness	4.852	2	2.426	.435	.648
	Ease Of Use	28.357	2	14.178	1.431	.243
	Intensions To Use	45.391	2	22.695	1.593	.208
	Perceived Risk	56.946	2	28.473	.857	.427
	Cost	53.156	2	26.578	.959	.386
Error	**Cloud Computing Awareness**	581.856	118	4.931		
	Compatibility	516.106	118	4.374		
	Perceived Usefulness	658.239	118	5.578		
	Ease Of Use	1169.433	118	9.910		
	Intensions To Use	1680.956	118	14.245		
	Perceived Risk	3918.967	118	33.212		
	Cost	3270.306	118	27.714		
Corrected Total	**Cloud Computing Awareness**	838.880	174			
	Compatibility	960.709	174			
	Perceived Usefulness	1014.309	174			
	Ease Of Use	1763.509	174			
	Intensions To Use	2482.857	174			

	Perceived Risk	5745.977	174			
	Cost	4847.429	174			

* Statistically significant at the level of significance ($\alpha \leq 0.05$)

There are statistic significant difference in "Compatibility" domain due to Age variable, F value was (3.973) by sig (0.021).

To explore the places of significant difference between descriptive of study domains due to Demographic variables, post Hoc test (scheffe) was used. Following tables show the results of scheffe test:

4.6. Age Variable

Table 20: The results of (scheffe) for "Cloud Computing awareness" domain, due to age variable

Age	**Mean**	**less than 30 years**	**30-39 years**	**More than 39 years**
less than 30 years	.727	-	.345	.541
30-39 years	.993		-	.761
More than 39 years	.266			-

Table 21: The results of (scheffe) for "Compatibility" domain, due to age variable

Age	Mean	less than 30 years	30-39 years	More than 39 years
less than 30 years	.973	-	0.371	0.168
30-39 years	1.173		-	0.840
More than 39 years	.200			-

Table 22: The results of (scheffe) for "Perceived Usefulness" domain, due to age variable

Age	Mean	less than 30 years	30-39 years	More than 39 years
less than 30 years	.237	-	.947	.838
30-39 years	.414		-	.899
More than 39 years	.177			-

Table 23:The results of (scheffe) for "Ease of Use" domain, due to age variable

Age	Mean	less than 30 years	30-39 years	More than 39 years
less than 30 years	1.508	-	.296	.479

30-39 years	1.128		-	.759
More than 39 years	.379			-

Table24: The results of (scheffe) for "Intensions to Use" domain, due to age variable

Age	**Mean**	**less than 30 years**	**30-39 years**	**More than 40 years**
less than 30 years	1.460	-	.451	.114
30-39 years	2.339		-	.359
More than 40 years	.879			-

Table 25: The results of (scheffe) for "Perceived Risk" domain, due to age variable

Age	**Mean**	**less than 30 years**	**30-39 years**	**More than 40 years**
less than 30 years	2.3354	-	.418	.286
30-39 years	2.701		-	.926
More than 40 years	3.660			-

Table 26: The results of (scheffe) for "Cost" domain, due to age variable

Age	Mean	less than 30 years	30-39 years	More than 40 years
less than 30 years	2.421	-	.325	.217
30-39 years	2.730		-	.937
More than 40 years	3.092			-

All of the above tables showing results of scheffe test for all domain due to age variables show that there is no difference between categories.

Table 27: The results of (scheffe) for all domain, due to experince variable

Dependent Variable	Experience	Experience	Mean Difference	Sig.
Cloud Computing Awareness	Less than 5 years	5-10 years	.5567	.448
		more than 10 years	-.0473	.994
	5-10 years	Less than 5 years	-.5567	.448
		more than 10 years	-.6040	.294
	more than 10 years	Less than 5 years	.0473	.994
		5-10 years	.6040	.294
Compatibility	Less than 5 years	5-10 years	-.0113	1.000
		more than 10 years	-.0784	.982
	5-10 years	Less than 5 years	.0113	1.000
		more than 10 years	-.0671	.983
	more than 10 years	Less than 5 years	.0784	.982
		5-10 years	.0671	.983
Perceived usefulness	Less than 5 years	5-10 years	.3393	.767
		more than 10 years	.1373	.958
	5-10 years	Less than 5 years	-.3393	.767
		more than 10 years	-.2020	.885
	more than 10 years	Less than 5 years	-.1373	.958
		5-10 years	.2020	.885
Ease of Use	Less than 5 years	5-10 years	.0357	.998
		more than 10 years	.9644	.311
	5-10 years	Less than 5 years	-.0357	.998
		more than 10 years	.9287	.237

	more than 10 years	Less than 5 years	-.9644	.311
		5-10 years	-.9287	.237
Intensions to Use	Less than 5 years	5-10 years	.1209	.987
		more than 10 years	.2507	.946
	5-10 years	Less than 5 years	-.1209	.987
		more than 10 years	.1298	.980
	more than 10 years	Less than 5 years	-.2507	.946
		5-10 years	-.1298	.980
Perceived Risk	Less than 5 years	5-10 years	-1.7773	.298
		more than 10 years	-.6435	.855
	5-10 years	Less than 5 years	1.7773	.298
		more than 10 years	1.1338	.525
	more than 10 years	Less than 5 years	.6435	.855
		5-10 years	-1.1338	.525
Cost	Less than 5 years	5-10 years	-1.4627	.374
		more than 10 years	-.4210	.923
	5-10 years	Less than 5 years	1.4627	.374
		more than 10 years	1.0417	.521
	more than 10 years	Less than 5 years	.4210	.923
		5-10 years	-1.0417	.521

The above tables showing results of scheffe test for all domain due to Experience variables illustrate that there is no difference between categories.

Table 28: The results of (scheffe) for all domain, due to position variable

Dependent Variable	(I) Position	(J) Position	Mean Difference (I-J)	Sig.
Cloud Computing Awareness	top level	middle level	-.4130	.622
		non-management	.0109	1.000
	middle level	top level	.4130	.622
		non-management	.4239	.559
	non-management	top level	-.0109	1.000
		middle level	-.4239	.559
Compatibility1	top level	middle level	-.0290	.997
		non-management	-.4543	.543
	middle level	top level	.0290	.997
		non-management	-.4254	.517
	non-management	top level	.4543	.543
		middle level	.4254	.517
Perceived usefulness	top level	middle level	.2319	.876
		non-management	-.0833	.984
	middle level	top level	-.2319	.876
		non-management	-.3152	.752
	non-management	top level	.0833	.984
		middle level	.3152	.752
Ease of Use	top level	middle level	.5580	.649
		non-management	.0652	.994
	middle level	top level	-.5580	.649
		non-management	-.4928	.676

	non-management	top level	-.0652	.994
		middle level	.4928	.676
Intensions to Use	top level	middle level	.2681	.933
		non-management	.5739	.741
	middle level	top level	-.2681	.933
		non-management	.3058	.900
	non-management	top level	-.5739	.741
		middle level	-.3058	.900
Perceived Risk	top level	middle level	.5942	.864
		non-management	-.3964	.940
	middle level	top level	-.5942	.864
		non-management	-.9906	.624
	non-management	top level	.3964	.940
		middle level	.9906	.624
Cost	top level	middle level	.5507	.860
		non-management	-.3652	.939
	middle level	top level	-.5507	.860
		non-management	-.9159	.616
	non-management	top level	.3652	.939
		middle level	.9159	.616

The above tables give results of scheffe test for all domain due to Position variables show that there is no difference between categories.

Table 29: The results of (scheffe) for all domain, due to organization size variable

Dependent Variable	Organization Size	Organization Size	Mean Difference	Sig.
Cloud Computing Awareness	Small	medium	-.0599	.990
		large	.7077	.263
	Medium	small	.0599	.990
		large	.7677	.150
	Large	small	-.7077	.263
		medium	-.7677	.150
Compatibility	Small	medium	-.9249	.075
		large	-.4617	.525
	medium	small	.9249	.075
		large	.4632	.456
	large	small	.4617	.525
		medium	-.4632	.456
Perceived Usefulness	small	medium	-.3043	.799
		large	-.3520	.745
	medium	small	.3043	.799
		large	-.0476	.993
	large	small	.3520	.745
		medium	.0476	.993
Ease of Use	small	medium	-1.6087*	.032
		large	-.9023	.339
	medium	small	1.6087*	.032

		large	.7063	.447
	large	small	.9023	.339
		medium	-.7063	.447
Intensions to Use	small	medium	-1.0843	.330
		large	-1.2243	.251
	medium	small	1.0843	.330
		large	-.1400	.978
	large	small	1.2243	.251
		medium	.1400	.978
Perceived Risk	small	medium	.6430	.845
		large	.8075	.771
	medium	small	-.6430	.845
		large	.1645	.987
	large	small	-.8075	.771
		medium	-.1645	.987
Cost	small	medium	.6858	.795
		large	.8654	.699
	medium	small	-.6858	.795
		large	.1797	.981
	large	small	-.8654	.699
		medium	-.1797	.981

* Statistically significant at the level of significance ($\alpha \leq 0.05$)

The above table mentions that Ease of Use is significantly different from other domains due to Size of Organization (small organizations) variable with value of significance 0.32 which is less than 0.05 with the mean difference 1.608.

Summary of Findings

The data analysis show that the Perceived ease of use has a direct effect on behavioral intention to use. Perceived usefulness has a direct effect on behavioral intention to use. Cost has a negative direct effect on behavioral intention to use. Perceived risk has a negative direct effect on behavioral intention to use. Perceived ease of use has a direct effect on perceived usefulness. There are statistic significant difference in "Compatibility" domain due to Age variable, F value was (3.973) by sig (0.021). Ease of Use is significantly different from other domains due to Size of Organization (small organizations)

CHAPTER 5

Outcomes and new scientific results

5.1 Outcomes

In the following chapter results of the study discussed in the light of previous literature and the new outcomes will be presented as well as the imitations. The analyses of the results revealed that the study achieved the main aims of the study to determine what are the main factors that affect the decision of adoption of cloud computing and how these factors affect the decision of adoption.

Analysis revealed that the proposed hypothesis perceived ease of use is likely to have a direct positive effect on behavioral intentions to use the cloud computing technology. It can simply be explained as the matter of awareness. The main influencing factor for the use of new technology is the information about that. If someone does not aware of cloud computing, it's not possible to use this technology for work. After the basic information, the concept build by user is important for the future use of that technology. It is also evident from studies stated in literature review that perceived ease of use, positively affects the behavioral intention. The famous model "Technology Acceptance Model" (TAM) also supports the findings. It explained the factors that have effect on the use of cloud computing; one of those factors was perceived ease of use. Perceived ease of use is attitude in other words. Attitudes have direct effects on human behavioral intentions and decision making. Therefore, when a person perceives the use of technology easy and have information

about it, there are more chances to use it. Literature review also concluded that when a person has the willingness to use certain technology, its probability of use increased. This willingness is developed through the attitude of perceived ease of use of certain technology. Abdullah and Seng (2015) also researched in this respect and presented a model in which they explain the factors effecting cloud computing usage. Perceived ease of use was also one of the factors of them. The main purpose of the technology is to provide assistance to the human beings. If it gets succeeded to formulate the attitude about the perceived ease of it there are more chances to use that technology (Abdullah & Seng, 2015).

Results of the study were also supported by a study conducted by Alharbi, Fawaz Atkins, Anthony Stanier (2016) in health sector. They also found that the adoption of technology also depends different factors. They explained five factors in this study. They examined perceived ease of use in terms of advantages gets from the technology and attitude change. If technology is beneficial but difficult to use and manage, the usage probability of that technology decreases a lot. Specific and complicated software like these can only be handled by the professionals and experts and even they need training to use these. Another study by Ratnam and Dominic (2014) was found in this respect. This study compared health insurance companies, health service providers and it industry. It explained that perceived ease of use increased the chances of usage of cloud computing. The study also summed up that by using cloud computing in healthcare sector, the service quality of the sector increased and satisfactory.

Cloud computing is newly developed technology and lots of benefits in organizational set up. Industries use it due to many factors such as perceived ease of use, financial support, perceived usefulness etc. (Gangwar, Date, & Ramaswamy, 2015) (lian & Dembla, 2014). In this rapidly changing environment, the use of technology becomes inevitable for organizations to enhance their performance. The main purpose of the organizations is to achieve its goals, and enhance its profit. This can't be avail by bad or decreased performance of the industry workers (Alaarj, Abidin-Mohamed, & Bustamam, 2016). Therefore, the emerging technology cloud computing was also studied in many ways. Opitz, Langkau, Schmidt and Kolbe (2012) conducted research and found that the use of technology makes the performance better in many ways depending upon different factors. One of the factors is the perceived ease of use. It increased the usage probability of cloud computing. Another study is found in this respect Opitz et al(2012). Gupta, Seetharaman and Raj (2013) explored the effecting factors in cloud computing adaptation. And they reported that the most favorable factor of its usage is the convenience factor. The perceived ease of use simply gives an idea of convenience to the users. Therefore, user wants to use this technology (Gupta, Seetharaman, & Raj, 2013).

It was hypothesized that Perceived usefulness has a direct effect on behavioral intention to use cloud computing which was also approved through analysis. As the user gets knowledge and basic information regarding the cloud computing technology, it gets more aware by the proposed benefits of cloud computing. The

perceived usefulness of the cloud computing technology was developed in the user through many ways such as his/her own previous experience, experience of someone else, the reporting of others about that particular technology and many more. The perceived usefulness of the cloud computing technology idea can also be built by seeing the other's factors for success. Burda and Teuteberg, (2014) conducting a research by using TAM and found that the usefulness affects the use of cloud computing adaptation as the user develops the idea that the technology will decrease the burden, will remove the chances of error; and will decrease the efforts and time consumption. All these factors increase the usefulness of the technology. Therefor when there is an idea of increased usefulness of certain technology, the adoption of that technology increased (Burda & Teuteberg, 2014). It is found in research by Shin (2015) that the perceived usefulness has significant positive effects on the adoption of cloud computing. It explains security factor contribution in perceived usefulness of it also. As cloud computing technology provides more secure ways for data computation, therefore user perceive more beneficial effect of it (Shin, 2015). A study by Wu (2011) explains the influential factors for the decision making of cloud computing adaptation. It summed up that market efforts, societal attitudes, security, trust, ease of use are some of the factors that increase the usefulness of cloud computing. One other study found in this context conducted by Park and Kim (2014) in which they explored the e influencing factors such as security, connectedness, attitude satisfaction etc develop an idea of perceived usefulness of the cloud computing technology. Therefore, many of the industries use cloud computing

technology (Park & Kim, 2014). Results of the research conducted by Arpaci (2016) also supported adoption of cloud computation. Findings of the research revealed that perceived usefulness subjective norms, and trust has a significant effect on attitude which has a significant effect on intention to use cloud computing.

Usefulness of cloud computing is seen in different ways by client, some of the factors are cost efficiency, resiliency, flexibility, visibility, scalability, and virtualization etc. The most significant advantage is the cost saving characteristic of cloud computing technology (Senyo, Effah, & Addae, 2016). This supports the result of this study that revealed that Cost has a negative direct effect on behavioral intention to use. Cost reduction is the major concern organizational setup. One of the main purposes of the organization is to reduce cost and increase productivity. Moreover, it has the characteristic of have access at anywhere from anytime. Sometime it's often difficult to carry the data in hard form. With the help of cloud computing technology person is able to facilitate his/herself from anywhere he/she wants the data, can easily access it. There is no demand of certain place or location. There is no pressure to continuously upgrade the previous information, as well as the system upgrade the files automatically. It reduces the fatigue and time-wasting effect for human beings. When talk about working in mutual collaboration means partnership, cloud computing also facilitates its user as reduce cost usage, data can be easily accessible from all the partners no matter where they are, they just required the pin code to login into the system. Hence it also reduces the cost. It also reduces the downtime which is also a cost for the companies. Cost is always a burden for the

organizations, so a system having the trait of cost effectiveness get famous in days in industry. When a user looks down the cost reduction trait of cloud computing, it increases his/her sense of usefulness of cloud computing and person willingly use this technology (Jackson, 2011).

In old days, when some file is missing, it was almost getting impossible to get the data again as data was saved in hard form. This problem can also be solved by using cloud computing, where there is no disruption of data. Disruption of data always makes a big problem for the organizational setup. In order to pursue the success this hindering factor must be figure out by the organizations. Therefore organizations use cloud computing by which they controlled the disruption of data. Moreover, it only requires from the users to enter a data in certain way. After the data entry, user have no need to do any task with that data like for data management and security. Cloud computing user can easily figure out their all data information by simply some clicks. Cloud computing also have another benefit that is the flexibility trait. In organizational setup, for performance evaluation and equal opportunity provision, there is need of the provision of same platform to everyone. Otherwise, in the absence of this equality other issues arise within the industrial setup. This supports the result of this study that revealed that Perceived Risks have negative direct effect on behavioral intention to use. Therefore, by using cloud computing, all users receive the same platform and there was not compatibility issue arise. Users can see and receive the data means data sharing facilitate the all involved persons. They don’t need to go personally to someone’s desk and take the specific data, or discuss

it in separate meetings, they just need to enter into the system. The same system is opened in all the members of the company, they easily make changes in it. Moreover, the other partners notify the changes through notifications (Pires & Camargo, 2010). Another factor that contribute into the benefits of cloud computing is the visibility factor. Unfortunately, it has less clarity but it can be understood in terms of mutual collaboration. For enhancing system performance, visibility factor is very critical. Another important trait of cloud computing is the virtualization. It means that we are eliminating the environmental impact. It can be understood by visualizing the situation where different people gather around to have a meeting but because of some issues of personal basis, the main purpose and agenda of the meeting remains ignored. Cloud computing sort out this negative impact of environment as all of the members can have access the data through any device at anywhere. Therefore, when there are all these factors for consideration, users develop an idea of perceived usefulness of cloud computing. After this attitude formation, they have more incline towards the adoption of cloud computing rather than manual work (Zhou, Zhu, Lin, & Bentley, 2012).

In brief cloud computing is the emerging and advanced technology that facilitates organizational setups in many ways. It works on several positive aspects of the industry therefore they easily adopt it. Many researches have explored its uses which benefit the users in multiple ways. For example, Carcary et al (2014) conducted a research and found that cloud computing provides the opportunity to foster business agility and it also manages platforms and capabilities within the organization. It

reduces time, it increases the resources of the company by facilitating the organization team in many ways. In today's rapidly changing environment organizational setup cannot be flourish without the use of technology. Technology use facilitates an organization on many dimensions. Therefore, the correct technology usage is a problem for the organizations. With the induction of cloud computing this issue is resolved so far companies introduce this technology within their organization, train their individuals about the cloud computing use. After this training every member can utilize its benefits and enhance their performance in many ways with the help of cloud computing. It reduces the time utilize by the staff. It also reduces the cost, which company bears. It also vanishes the environmental factor and influence, providing equality, system up gradation and many more. In today's digital centric operating environment, Information technology has become integral to delivering strategic objectives across many industry sectors. It is empirically explored that decision makers keenly observe the benefits of the cloud computing and suggest the use of cloud computing. Although there are some issues also with the cloud computing use, but the benefits are more than the issue. In other words, it can be said that cost benefit analysis revealed and recommend the use of cloud computing within the industrial setup. As if the data is secure within the company, costumers develop their trust upon them. By using cloud computing, companies assure their data security issue (Dutta, Guo, & Choudhary, 2013). It is reported that the use of cloud computing is increased a lot due to its beneficial factors in the last some years. Organizations adopt cloud computing in order to improve,

maintain and increase their service quality, so that more customers get attraction towards them and ultimately organization gets its main objectives that is increased performance and productivity (Kark, White, & Briggs, 2015). Another research explored the need of cloud computing in the area of medicine and health care lead the health care experts towards exploring new and more beneficial which bring advancements in these areas so that new diagnostic methods and techniques of data management can be introduced and used in to assist experts and benefit the patients. Diagnostic advancements should be introduced for the betterment of patient and its care takers. In hospital settings, data entry and data management is a major issue from the last decades as the disease spread is increased. Hence the role of cloud computing increased a lot in health care sector (Calabrese & Cannataro, 2015). Cloud computing has the ability to support a broad range of healthcare IS, including clinical applications (such as EHR, physician order entry, telemedicine and medical imaging) and nonclinical applications which are more typical of business organizations generally (such as revenue management helpdesk software, patient billing, HR and payroll management) (Calabrese & Cannataro, 2015) (Griebel, et al., 2015) Another explorer summed up the contributing factors for cloud computing are security, privacy, relative advantage, complexity. According to him, these factors aid the human beings and companies and formulate a healthy attitude towards cloud computing. Therefore, people want to utilize the benefits of cloud computing in order to increase the efficiency and performance and to decrease the cost, time consumption, security issues and complexity.

5.2 Limitations and Suggestions

Here are some limitations of the study that we suggest to be taken into consideration when doing future work.

- In the present research data was collected from one organization which may be weaken part. For future cross companiess comparison should be made for the assessment of adoption of cloud computing.
- The present research utilized form one culture. There may a comparison of cross culture, so that the phenomenon can be explored around the globe.
- Sample size was small for future sample size should be increase.
- For future research there should be evaluate different level of management who use cloud computing.
- The performance of different types of management within the organization and outside of the organizations should be explore mores.
- Equal opportunity should be given in sampling means male and female participation ration should be equal.
- The present research quantitatively assesses the phenomenon only. It is recommended for the future to use qualitative means of exploration also.
- For the future research, a comparison should be made between the professionals and beginners for the use of cloud computing and their attitude.
- A comparison should also be made between private and public sector also.

- In the present research there was time constraints. It is recommended for the future researches to evaluate the phenomenon in longitudinal means of study so that effects of cloud computing can be figure out with respect to time.
- More advanced data analysis techniques should be use in future researches.
- The sample categories also be explored with respect to age, gender and education so that more explanation of the phenomenon can be drawn.
- The different data collection techniques should also be used for future researches.

5.3 New scientific results

This is one of the first studies that investigated the factors that influence the adoption of cloud computing study to determine what are the main factors that affect the decision of adoption of cloud computing and how these factors affect the decision of adoption. My study is a pioneer to determines the main factors that affect the decision of adoption of cloud computing and how these factors affect the decision of adoption. The study is the one of the first studies in the region to investigate innovative technology at the individualistic level within the organizational context in Jordan. the research determined the main factors that affect the adoption of cloud computing from the previous studies through the literature review and then the hypothesises were developed and tested after getting the data by the survey. the results revealed new scientific outcomes by define what are the important factors that affect the decision of adoption cloud

computing technology. Cloud computing awareness and Compatibility doesn't appear as an important factors to affect the behavioral intension to use of cloud computing. Perceived ease and Perceived usefulness have positive effect on behavioral intension to use. however Cost and Perceived risk have negative effect on behavioral intension to use of cloud computing.

5.4 Summary

This is one of the first researches that investigated adoption of cloud computing technology at individualistic level within the organizational context in Jordan. By discussing all of the above factors it can be concluded that cloud computing is an emerging and promising technology within the industrial set up. It has many advantages in terms of cost reduction, time consumption, compatibility of staff, equal platform provision, virtualization, flexibility, security etc.1b, all these factors contribute a lot in the path of success for not only the organizations but also for the staff members. It reduces their burden as well as the organization. Hence in order to obtain the goal formulated by the companies, and to compete with the other market competitors, cloud computing adoption become inevitable factor. It supports companies as backbone by resolving their lots of issues. In this technological era most of the developed companies are using cloud computing system. Professional also get interested to work within those companies who use cloud computing because it reduces the fatigue effects, boredom effect, increase efficiency, performance, eliminating the location factor. So, the service provider of the cloud computing should pay more attention

on perceived ease of use, perceived usefulness, cost and perceived risk when they develop their applications and business models for Jordanian market.

Összefoglalás

Ez a kutatás elsőként vizsgálja a felhőalapú informatikai technológia alkalmazását individuális nézőpontból Jordánia szervezeti környezetében. A tényezők vizsgálatával megállapítható, hogy a felhőalapú informatikai megoldások egy feltörekvő és ígéretes technológiként jelennek meg a jordán üzleti vállalkozásoknál. Előnyei között említhető a költség- és időfelhasználás csökkentése, a személyzet kompatibilitása, az egyenlő platformszolgáltatás, a virtualizáció, a rugalmasság vagy a biztonság. Mindezek a tényezők nagyban hozzájárulnak a szervezetek, ezen belül a munkatársak hatékonyságához, sikeréhez Az alkalmazottak és a szervezetek terheit egyaránt csökkentik. Ezért annak érdekében, hogy a vállalatok elérjék a kitűzött célokat és az erős piaci versenyben életbe maradjanak, a felhőalapú informatikai alkalmazása elkerülhetetlen tényezővé válik. Igénybe vétele, mint egy tartóoszlop képes a vállalatokat sok nehézségét megoldani. A technológiai fejlettség ezen korszakban a vállalatok többsége felhőalapú informatikai rendszert használ. A szakembereknek szintén érdekében áll felhőalapú informatikai rendszert használó cégekkel dolgozni, mert ez csökkenti a fáradtságot, az egyhangúságot, növeli a hatékonyságot, a teljesítményt, kiküszöböli a fizikai jelenlét tényezőjét. Éppen ezért a felhőalapú informatika szolgáltatójának nagyobb figyelmet kell fordítania a használat egyszerűségére, hasznosságára, költségére és észlelt

kockázatára, amikor alkalmazásokat és üzleti modelleket fejlesztenek a jordán piacon.

Related publications:

Journals

Atobishi, T., & Szalay, Z. G. (2018). The Impact of Information System on Administrative Service Quality In Hospitals: The Case of Prince Hamzah Hospital, Jordan 2015. *Studia Mundi - Economica*, *5*(2), 143–152. doi: 10.18531/studia.mundi.2018.05.02.143-152

Atobishi, T., Erboz, G., & Podruzsik, S. (2018). E-Banking Effects on Customer Satisfaction: The Survey on Clients in Jordan Banking Sector. *International Journal of Marketing Studies*, *10*(2), 151. doi: 10.5539/ijms.v10n2p151

Nosratabadi, S., Atobishi, T., & Motaghi, H. (2018). A Circular Business Model for Cloud Computing Service Providers. *International Journal of Community Development & Management Studies*, 2, 105-120, Retrieved from: http://ijcdms.org/Volume02/v2p105-120Motaghi4669.pdf

Atobishi, T, Podruzsik, S., & Gabor, S. Z.: Adoption of Mobile Banking in Jordan, *Journal of Management Studies*, accepted

Atobishi, T, Miriam, B.Fogarassy C.: Adoption of Cloud Computing The Case of Jordanian Business Organizations, ready for publication . *Acta Polytechnica Hungarica* .accepted and will be published in June 2020

Conference proceedings

Atobishi, T., Szalay, Z. G., & Bayraktar, S. (2018). Cloud Computing And Big Data In The Context Of Industry 4.0 : Opportunities And Challenges. *Proceedings of the IISES Annual Conference, Sevilla, Spain*. doi: 10.20472/iac.2018.035.004

Atobishi, T., Podruzsik, S., & Gabor, S. Z. (2018). A review of the Security challenges in the cloud computing. *Proceedings of the 7th International Conference on Research in Science and Technology*. doi: 10.33422/8rst.2018.11.38

Atobishi, T., Podruzsik, S. (2017). Factors Affecting the Decision of Adoption Cloud Computing Technology. *Proceedings of the* Conference: MIC 2017: Managing the Global Economy. p. 135-139

Atobishi, T., Podruzsik, S. (2017). evaluating the factors affecting the decision of adoption Cloud Computing technology. *Proceeding of 6th International Conference of Economic Sciences Kaposvár University. ISBN: 9786155599422*

References

1. Agarwal, R., & Prasad, J. (1997).The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. Decision sciences, 28(3), 557-582.

2. Ahmadi, H., Ibrahim, O., & Nilashi, M. (2015). Investigating a new framework for hospital information system adoption: a case on Malaysia. *Journal of Soft Computing and Decision Support Systems*, *2*(2), 26-33.

3. Alaarj, S., Abidin-Mohamed, Z., & Bustamam, U. S. B. A. (2016). Mediating Role of Trust on the Effects of Knowledge Management Capabilities on Organizational Performance. *Procedia - Social and Behavioral Sciences*, *235*, 729–738. doi: 10.1016/j.sbspro.2016.11.074
4. Alamgir Hossain, M., & Quaddus, M. (2011). The adoption and continued usage intention of RFID: An integrated framework. *Information Technology & People*, *24*(3), 236-256.

5. Alharbi, F., Atkins, A., & Stanier, C. (2015). Strategic framework for cloud computing decision-making in healthcare sector in Saudi Arabia. In *Seventh Int. Conf. eHealth, Telemedicine, Soc. Med* (Vol. 1, pp. 138-144).

6. Alharbi, F., Atkins, A., & Stanier, C. (2016). Understanding the determinants of Cloud Computing adoption in Saudi healthcare organisations. *Complex & Intelligent Systems*, *2*(3), 155–171. doi: 10.1007/s40747-016-0021-9

7. Alshamaila, Y., Papagiannidis, S., & Li, F. (2013). Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework. *Journal of Enterprise Information Management*, *26*(3), 250-275.

8. AlZain, M. A., Pardede, E., Soh, B., & Thom, J. A. (2012, January). Cloud computing security: from single to multi-clouds. In *System*

Science (HICSS), 2012 45th Hawaii International Conference on (pp. 5490-5499). IEEE.

9. Amini, M. (2014) The Factors That Influence on Adoption of Cloud Computing for Small and Medium Enterprises. *Masters Dissertation, Universiti Teknologi Malaysia, Johor.*

10. Arora, P., Wadhawan, R. C., & Ahuja, E. S. P. (2012). Cloud computing security issues in infrastructure as a service. *International journal of advanced research in computer science and software engineering*, *2*(1).

11. Arpaci, I. (2016). Understanding and predicting students' intention to use mobile cloud storage services. *Computers in Human Behavior, 58*, 150-157.

12. Bagish, S. S. (2014). Student's Awareness of Cloud Computing: Case Study Faculty of Engineering at Aden University, Yemen. *International Journal of Engineering Development and Research*, *2*(1), 1122–1129

13. Baker J. (2012) The Technology–Organization–Environment Framework. In: Dwivedi Y., Wade M., Schneberger S. (eds) Information Systems Theory. Integrated Series in Information Systems, vol 28. Springer, New York, NY

14. Balduzzi, M., Zaddach, J., Balzarotti, D., Kirda, E., & Loureiro, S. (2012, March). A security analysis of amazon's elastic compute cloud service. In *Proceedings of the 27th Annual ACM Symposium on Applied Computing* (pp. 1427-1434). ACM.

15. Behrend, T. S., Wiebe, E. N., London, J. E., & Johnson, E. C. (2010). Cloud computing adoption and usage in community colleges. *Behaviour & Information Technology*, *30*(2), 231-240.

16. Bhadauria, R., & Sanyal, S. (2012). Survey on security issues in cloud computing and associated mitigation techniques. *arXiv preprint arXiv:1204.0764*.

17. Botta, A., De Donato, W., Persico, V. & Pescapé, A. (2016). Integration of cloud computing and internet of things: a survey. *Future Generation Computer Systems*, *56*, pp.684-700.

18. Burda, D., & Teuteberg, F. (2014). The role of trust and risk perceptions in cloud archiving — Results from an empirical study. *The Journal of High Technology Management Research*, *25*(2), 172–187. doi: 10.1016/j.hitech.2014.07.008

19. Carcary, M., Doherty, E., Conway, G., & Mclaughlin, S. (2014). Cloud Computing Adoption Readiness and Benefit Realization in Irish SMEs—An Exploratory Study. *Information Systems Management*, *31*(4), 313–327. doi: 10.1080/10580530.2014.958028

20. Davis, F. D. (1985). A technology acceptance model for empirically testing new end-user information systems: theory and results (dissertation).

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

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

23. DOS.(2016).Jordan statistical year book 2016.*Deapartemnt of statistics .available :* http://dosweb.dos.gov.jo/ar/publications/. Accessed 16 septemper 2019

24. DOS.(2020). department of statistics ,Amman - Jordan . available : http://dosweb.dos.gov.jo/ar/. Accessed 15 March 2020

25. Dutta, A., Peng, G.C. and Choudhary, A. (2013) Risks in enterprise cloud computing: the perspective of IT experts. *Journal of Computer Information Systems*, 53 (4). pp. 39-48.

26.

27. Dwivedi, Y. K., Schneberger, S. L., & Wade, M. R. (2012). *Information systems theory: explaining and predicting our digital society*. New York, NY: Springer.

28. Espadas, J., Molina, A., Jiménez, G., Molina, M., Ramírez, R., & Concha, D. (2013). A tenant-based resource allocation model for scaling Software-as-a-Service applications over cloud computing infrastructures. *Future Generation Computer Systems*, *29*(1), 273-286.

29. 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.

30. Giessmann, A., Stanoevska, K. (2012). Platform as a Service – A Conjoint Study on Consumers' Preferences. In: ICIS. *AIS Electronic Library (AISeL), Orlando*

31. Gonçalves, J. M., & da Silva Gonçalves, R. P. (2012). Overcoming resistance to changes in information technology organizations. *Procedia Technology*, *5*, 293-301.

32. Gonidis, F., Simons, A. J., Paraskakis, I., & Kourtesis, D. (2013, September). Cloud application portability: an initial view. In *Proceedings of the 6th Balkan Conference in Informatics* (pp. 275-282). ACM.

33. Goyal, S. (2014). Public vs private vs hybrid vs community-cloud computing: a critical review. *International Journal of Computer Network and Information Security*, *6*(3), 20.

34. Griebel, L., Prokosch, H.-U., Köpcke, F., Toddenroth, D., Christoph, J., Leb, I., … Sedlmayr, M. (2015). A scoping review of cloud computing

in healthcare. *BMC Medical Informatics and Decision Making*, *15*(1). doi: 10.1186/s12911-015-0145-7

35. Gupta, P., Seetharaman, A., & Raj, J. (2013). The usage and adoption of cloud computing by small and medium businesses. *International Journal of Information Management,* 33, 5, 861-874.

36. Gutierrez, A., Boukrami, E., & Lumsden, R. (2015). Technological, organisational and environmental factors influencing managers' decision to adopt cloud computing in the UK. *Journal of Enterprise Information Management*, *28*(6), 788-807.

37. Hamdaqa, M., & Tahvildari, L. (2012). Cloud Computing Uncovered: A Research Landscape. *Advances in Computers Volume 86, 41–85* 4.

38. Hasan, L. M., Zgair, L. A., Ngotoye, A. A., Hussain, H. N., & Najmuldeen, C. (2015). A review of the factors that influence the adoption of cloud computing by small and medium enterprises. *Scholars Journal of Economics, Business and Management*, *2*, 842-848.

39. Hassan, Haslinda and Ismail, Noor Azizi (2015) Cloud computing: Use and impact of technology. *5th International Conference on Computing and Informatics (ICOCI) 2015*, 11-13 August 2015, Istanbul, Turkey.

40. Hassan, H., Nasir, M., Herry, M., Khairudin, N., &Adon, I. (2017). Factors influencing cloud computing adoption in small and medium enterprises. *Journal of Information and Communication Technology*, *16*(1), 21-41.

41. Hess, T. J., McNab, A. L., &Basoglu, K. A. (2014). Reliability Generalization of Perceived Ease of Use, Perceived Usefulness, and Behavioral Intentions. *Mis Quarterly*, *38*(1).

42. Hinde, C., & Van Belle, J. P. (2012). Cloud computing in South African SMMEs: Risks and rewards for playing at altitude. *International Journal of Computer Science and Electrical Engineering*, *1*(1), 1-10.

43. 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.

44. Huang, P. Y., Ouyang, T. H., Pan, S. L., & Chou, T. C. (2012). The role of IT in achieving operational agility: A case study of Haier, China. *International Journal of Information Management*, *32*(3), 294-

45. Ishak, S. S. M., & Newton, S. (2016). An innovation resistance factor model. *Construction Economics and Building*, *16*(3), 87-103.

46. J.L. Abdullah, L.C. Seng. (2015) **.** Acceptance of Cloud Computing in Klang Valley's Health Care Industry. *Malaysia**,**Int. J. Econ. Commer. Manag, III (*6), pp. 392-415

47. Jackson, K. L. (2012, May 12). The Economic Benefit of Cloud Computing. Retrieved June 4, 2019, from https://www.forbes.com/sites/kevinjackson/2011/09/17/the-economic-benefit-of-cloud-computing/#5e11a195225c

48. Jadeja, Y., &Modi, K. (2012, March). Cloud computing-concepts, architecture and challenges. In *Computing, Electronics and Electrical Technologies (ICCEET), 2012 International Conference on* (pp. 877-880). IEEE.

49. Jula, A., Sundararajan, E., &Othman, Z. (2014). Cloud computing service composition: A systematic literature review. *Expert Systems with Applications*, *41*(8), 3809-3824.

50. K. A. Ratnam and P. D. D. Dominic. (2014) .Adoption of cloud computing to enhance the healthcare services in Malaysia.*International Conference on Computer and Information Sciences (ICCOINS)*, Kuala Lumpur, 2014, pp. 1-6. doi: 10.1109/ICCOINS.2014.6868413

51. Kalapatapu, A., & Sarkar, M. (2012). Cloud computing: An overview. *Cloud Computing: Methodology, Systems and Applications*, 1-28.

52. Kark, K. White, M. Briggs, B.*(*2015).Global Cio survey.*Deloitte university press.*

53. Karunakaran, S. (2013). Impact of cloud adoption on agile software development. In *Software Engineering Frameworks for the Cloud Computing Paradigm* (pp. 213-234). Springer London.

54. Kshetri, N. (2013). Privacy and security issues in cloud computing: The role of institutions and institutional evolution. *Telecommunications Policy*, *37*(4), 372-386.

55. Laudon, K. C., &Laudon, J. P. (2016). Management information system. *Pearson Education India*.

56. 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.\
57. Lin, A., & Chen, N. C. (2012). Cloud computing as an innovation: Percepetion, attitude, and adoption. *International Journal of Information Management*, *32*(6), 533-540.

58. Liu, F., Shu, P., Jin, H., Ding, L., Yu, J., Niu, D., & Li, B. (2013). Gearing resource-poor mobile devices with powerful clouds: architectures, challenges, and applications. *IEEE Wireless communications*, *20*(3), 14-22.

59. Low, C., Chen, Y., & Wu, M. (2011). Understanding the determinants of cloud computing adoption. *Industrial Management & Data Systems*, *111*(7), 1006–1023. doi: 10.1108/02635571111161262

60. Lu, Y., Xu, X., & Xu, J. (2014). Development of a hybrid manufacturing cloud. *Journal of Manufacturing Systems*, *33*(4), 551-566.

61. Ma, X., Cui, Y., &Stojmenovic, I. (2012). Energy efficiency on location based applications in mobile cloud computing: a survey. *Procedia Computer Science*, *10*, 577-584.

62. Malladi, S., & Krishnan, M. S. (2012). Cloud computing adoption and its implications for CIO strategic focus–an empirical analysis.

63. Manvi, S. S., &Shyam, G. K. (2014). Resource management for Infrastructure as a Service (IaaS) in cloud computing: A survey. *Journal of Network and Computer Applications*, *41*, 424-440.

64. Marston, S., Li, Z., Bandyopadhyay, S., Zhang, J., &Ghalsasi, A. (2011). Cloud computing—The business perspective. *Decision support systems*, *51*(1), 176-189.
65. Mcquarrie E .F. (2011*). The Market Research Toolbox: A Concise Guide for Beginners*, 3rd Edition. Thousand Oaks, CA: Sage Publications, Inc.

66. Mell, P. &Grance, T. (2011). *The NIST Definition of Cloud Computing. National Institute of Standards and Technology (NIST), Special Publication Draft-800-145*. [Online]. Available through: <https://csrc.nist.gov/publications/detail/sp/800-145/final>. [Accessed on 22 September 2017].

67. Monroy, C.R., Arias, C.A., & Guerrero, Y.N. (2013). The New Cloud Computing Paradigm: The Way to IT seen as a Utility.*Latin American and Caribbean Journal of Engineering Education,* V. 6 (n. 2); pp. 24-31. ISSN 1935-0295

68. Nedev, S. (2014). Exploring the factors influencing the adoption of Cloud computing and the challenges faced by the business. *Enquiry-The ACES Journal of Undergraduate Research*, *5*(1).

69. 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.

70. Oliveira, T., Thomas, M., &Espadanal, M. (2014). Assessing the determinants of cloud computing adoption: An analysis of the manufacturing and services sectors. *Information& Management*, *51*(5), 497-510.

71. Opitz, N., Langkau, T. F., Schmidt, N. H., & Kolbe, L. M. (2012). Technology Acceptance of Cloud Computing: Empirical Evidence from German IT Departments. *2012 45th Hawaii International Conference on System Sciences*. doi: 10.1109/hicss.2012.557

72. Palos-Sanchez, P. R., Arenas-Marquez, F. J., & Aguayo-Camacho, M. (2017). Cloud Computing (SaaS) adoption as a strategic technology: Results of an empirical study. *Mobile Information Systems, 2017*.

73. Park, E., K.J. Kim, 2014. An Integrated Adoption Model of Mobile Cloud Services: Exploration of Key Determinants and Extension of Technology Acceptance Model. *Telematics and Informatics,* 31(3): 376-385.

74. Pearson, S. (2013). Privacy, security and trust in cloud computing. In *Privacy and Security for Cloud Computing* (pp. 3-42). Springer London.

75. Peng, R., Xiong, L., & Yang, Z. (2012). Exploring tourist adoption of tourism mobile payment: An empirical analysis. *Journal of theoretical and applied electronic commerce research*, *7*(1), 21-33.

76. Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. *(2004).* Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research, 14, 224-235.*

77. Pires, S. R; Camargo, J. B. (2010).Using Cloud Computing To Integrate Processes. (2010). *Proceedings of the POMS 21st Annual Conference.*, 1–18.

78. Rader, D. (2016). How cloud computing maximizes growth opportunities for a firm challenging established rivals. *Strategy & Leadership*, *40*(3), 36-43.

79. Rimal, B. P., & Choi, E. (2012). A service-oriented taxonomical spectrum, cloudy challenges and opportunities of cloud computing. *International Journal of Communication Systems*, *25*(6), 796-819.

80. Sabi, H. M., Uzoka, F. M. E., Langmia, K., &Njeh, F. N. (2015). Conceptualizing a model for adoption of cloud computing in education. *International Journal of Information Management*, *36*(2), 183-191.

81. Saedi, A., &Iahad, N. A. (2013, June). An Integrated Theoretical Framework for Cloud Computing Adoption by Small and Medium-Sized Enterprises. In *PACIS* (p. 48).

82. Sanaei, Z., Abolfazli, S., Gani, A., &Buyya, R. (2014). Heterogeneity in mobile cloud computing: taxonomy and open challenges. *IEEE Communications Surveys & Tutorials*, *16*(1), 369-392.

83. Seethamraju, R. (2015). Adoption of software as a service (SaaS) enterprise resource planning (ERP) systems in small and medium sized enterprises (SMEs). *Information systems frontiers*, *17*(3), 475-492.

84. Sentosa, I., & Mat, N. K. N. (2012). Examining a theory of planned behavior (TPB) and technology acceptance model (TAM) in internetpurchasing using structural equation modeling. *Researchers World*, *3*(2 Part 2), 62.

85. Senyo, P., Effah, J. and Addae, E. (2016), "Preliminary insight into cloud computing adoption in a developing country", *Journal of Enterprise Information Management*, Vol. 29 No. 4, pp. 505-524.

86. Sethi, S., Sahu, A., & Jena, S. K. (2012). Efficient load balancing in cloud computing using fuzzy logic. *IOSR Journal of Engineering*, *2*(7), 65-71.

87. Shin, D. (2015). Beyond user experience of cloud service: Implication for value sensitive approach. *Telematics and Informatics*, *32*(1), 33–44. doi: 10.1016/j.tele.2014.02.002

88. Shin, D. H. (2013). User centric cloud service model in public sectors: Policy implications of cloud services. *Government Information Quarterly*, *30*(2), 194-203.

89. Sichel, D. E. (2001). *The computer revolution: An economic perspective*. Brookings Institution Press.

90. Solanki,J., Davda,R., & Patel,C. (2017). A Survey : Cloud Computing Challenges & Security Issues. *International Journal of Modern Trends in Engineering & Research*, 4(3), 57-61.doi:10.21884/ijmter.2017.4079.cfbgf

91. Srinivasan, A., Quadir, M. A., &Vijayakumar, V. (2015). Era of cloud computing: a new insight to hybrid cloud. *Procedia Computer Science*, *50*, 42-51.

92. Sun, Y., Zhang, J., Xiong, Y., & Zhu, G. (2014). Data security and privacy in cloud computing. *International Journal of Distributed Sensor Networks*, *10*(7), 190903.

93. Tarmidi, M., Rasid, S. Z. A., Alrazi, B., & Roni, R. A. (2014). Cloud Computing Awareness and Adoption among Accounting Practitioners in Malaysia. *Procedia - Social and Behavioral Sciences*, *164*, 569–574. doi: 10.1016/j.sbspro.2014.11.147

94. Tehrani, S. R., &Shirazi, F. (2014, June). Factors influencing the adoption of cloud computing by small and medium size enterprises (SMEs). In *International Conference on Human Interface and the Management of Information* (pp. 631-642). Springer, Cham.

95. The Boston Consulting Group Mell, P. and Grance, T. (2011), “The NIST definition of cloud computing”, available at: http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf (accessed 17 December 2016).

96. Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information systems research*, *11*(4), 342-365.

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

98. Wahsh, M., & Dhillon, J. (2015). A systematic review of factors affecting the adoption of cloud computing for E-government implementation. *Journal of Engineering and Applied Sciences. ARPN., in press*. 10(23), 17824-17832.

99. Wu, J.-H., Wang, S.-C., & Lin, L.-M. (2005). What Drives Mobile Health Care? An Empirical Evaluation of Technology Acceptance. *Proceedings of the 38th Annual Hawaii International Conference on System Sciences*. doi: 10.1109/hicss.2005.689

100. Wu, L., Garg, S. K., &Buyya, R. (2012). SLA-based admission control for a Software-as-a-Service provider in Cloud computing environments. *Journal of Computer and System Sciences*, *78*(5), 1280-1299.

101. Xiao, Z., & Xiao, Y. (2013). Security and privacy in cloud computing. *IEEE Communications Surveys & Tutorials*, *15*(2), 843-859.

102. Yang, B., Kim, Y., &Yoo, C. (2013). The integrated mobile advertising model: The effects of technology-and emotion-based evaluations. *Journal of Business Research*, *66*(9), 1345-1352.

103. Zeqiri, A., Aliu, L., Kostanica, F. & Prenaj, B. (2017). An empirical investigation of cloud computing usage in education. *La Revue des Sciences de Gestion*, 285-286(3), 77-85. doi:10.3917/rsg.285.0077.

104. Zhou, L.; Zhu, Y.; Lin, Y.; Bentley, Y. (2012).Cloud supply chain: A conceptual model. *Proceedings of International Working Seminar on Production Economics*

105. Zissis, D., & Lekkas, D. (2012).Addressing cloud computing security issues. *Future Generation Computer Systems*, 28(3), 583-592. doi:10.1016/j.future.2010.12.006

106. Hashizume, K., Rosado, D.G., Fernández-Medina, E. *et al.(2013)* An analysis of security issues for cloud computing. *J Internet Serv Appl*

107. Iqbal, S., Kiah, M. L. M., Dhaghighi, B., Hussain, M., Khan, S., Khan, M. K., & Choo, K.-K. R. (2016). On cloud security attacks: A taxonomy and intrusion detection and prevention as a service. *Journal of Network and Computer Applications*, *74*, 98–120. doi: 10.1016/j.jnca.2016.08.016

108. Yu, B., Sen, R., & Jeong, D. H. (2013). An integrated framework for managing sensor data uncertainty using cloud computing. *Information Systems*, *38*(8), 1252–1268. doi: 10.1016/j.is.2011.12.003

109. Stewart, D. W., & Kamins, M. A. (1998). *Secondary research: information sources and methods*. Newbury Park: Sage.

110. Green, P. E., & Srinivasan, V. (1978). Conjoint Analysis in Consumer Research: Issues and Outlook. *Journal of Consumer Research*, *5*(2), 103. doi: 10.1086/208721

111. Calabrese, B., & Cannataro, M. (2015). Bioinformatics and Microarray Data Analysis on the Cloud. *Methods in Molecular Biology Microarray Data Analysis*, 25–39. doi: 10.1007/7651_2015_236

Appendix (A1) Questionnaire

Introduction

The researcher has conducted a study entitled with measuring the factors that affecting the decision of adoption of cloud computing services in Jordanian business organizations. So please answer all the enclosed items of the questioner by adding (x) under the suitable alternatives given in each item, knowing that your answers will be used only for scientific research purposes.

Researcher: Thabit ATboshi

Thanks for your cooperation.

Cloud computing is the new generation of IT services paradigm. **Cloud computing** is a model for enabling convenient, on demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. Essential Characteristics of this technology : On-demand self-service , Broad network access , Resource pooling , Rapid elasticity, and Measured Service

First: personal information.

Gender: Male Female

Age: less than 30 30-39

more than 39

Experience: 5-10 years less than 5 years

More than 10 years

The occupying position : ☐ lower level IT management

☐ Middle level IT management

☐ Top level IT management

Second: Organization information

Organization size : ☐ small(Number of employees >50)

☐ Medium (50 <=number of employees <=249)

☐ Large (Number of employees>=250)

What is the primary type business conducted by your organization?

☐ Agriculture , forestry and fishing ☐ Mining

☐ Manufacturing ☐ Electricity

☐ Construction ☐ wholesale trade

☐ Retail trade ☐ accommodation, hospitality, food/beverage services

☐ Banking and insurance service ☐ real state service

☐ Health care ☐ public administration

☐ Education and training ☐ transportation

Others…….

Where is the market scope of your organization?

☐ Local ☐ national ☐ international

Item	Strongly agree	agree	neutral	disagree	Strongly disagree
Cloud computing awareness					
I have received enough information about cloud computing					
I have received enough information about benefits of using cloud computing					
I have enough information about services that are offered through cloud computing					
Perceived risk					
I think using cloud computing in monetary transactions has potential risk					
I think using cloud computing in merchandise services has potential risk					

I think using cloud computing in product purchases has potential risk					
I think using cloud computing puts my privacy at risk					
Cost					
I think the equipment cost is expensive of using cloud computing to offer integrated services					
I think the access cost is expensive of using cloud computing architecture of my organization					

I think the transaction fee is expensive of using cloud computing would be easy					
Compatibility					
Using cloud computing is compatible with most aspects of my tasks					
Using cloud computing fits my work					
Using cloud computing fits well with the way I like to engage in doing my work					
Perceived usefulness					
I think Using cloud computing allow me to manage business operation efficiently					
I think Using cloud computing allow me to					

increase business productivity					
I think Using cloud computing enables me to do my organizational task more quickly					
Perceived ease of use					
I think Learning to run and use the cloud services would be easy for me					
I think my interaction with the cloud computing services would be clear and understandable					

I think that cloud computing services is easy to use.					
Behavioral intension to use					
generally, I think that using cloud computing services is advantageous					
generally, I am in favor of using the cloud computing services					
Assuming I had access to cloud computing, I intend to use it					
Given that I had access to cloud computing , I predict that I would use it					

Any additional notes

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This questioner is built on previous studies here:

- U, J., & Wang, S. (2005). What drives mobile commerce? Information & Management, 42(5), 719-729. doi:10.1016/j.im.2004.07.001- Venkatesh, Morris, Davis, & Davis. (2003). User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, 27(3), 425. doi:10.2307/30036540

-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. doi:10.1108/jeim-08-2013-0065

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