THE REPUBLIC OF TURKEY
BAHCESEHIR UNIVERSITY

INVESTIGATING FACTORS INFLUENCING CLOUD COMPUTING ADOPTION AMONG IRANIAN AND TURKISH USERS

Master's Thesis

PARASTOO DASHTI

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THE REPUBIC OF TURKEY

BAHCESEHIR UNIVERSITY

GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCE
INFORMATION TECHNOLOGIES

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Thesis Supervisor: Assist. Prof. Dr. YUCEL BATU SALMAN

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ABSTRACT

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Parastoo Dashti

Information Technologies

Thesis Supervisor: Assist. Prof. Dr. YUCEL BATU SALMAN

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Cloud computing is a new model for the provision of computing resources and services. The current project aims to understand the factors that can significantly affect Turkish and Iranian acceptance intention and use behavior for cloud computing. The project empirically tests variables of technology acceptance model including Perceived Usefulness, Perceived Ease of Use, Subjective Norm, Facilitating Conditions and Intention to Use. Perceived Risk and Compatibility constructs were also added as experimental variables .Data was collected from a questionnaires distributed to IT specialists in both Turkey and Iran. The Cranach's alpha technique was used to evaluate the reliability of data. The correlation between variables of the model was examined through Pearson Product Technique. All of the original TAM factors has found to have significant effect on both countries Use Behavior but the experimental construct's effect were not supported by the results.

Keywords: Technology Acceptance Model, Cloud Computing, Technology Adoption.

Özet

BULUT BİLİŞİMİN TÜRK VE İRANLI KULLANICILAR ARASINDAKİ BENİMSENMESİNİ ETKİLEYEN FAKTÖRLERİN İNCELENMESİ

Parastoo Dashti

Bilgi Teknolojileri

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Mayıs 2014 75 Sayfa

Bulut bilişim, bilişim altyapısının ve hizmetlerinin sağlanması için yeni bir paradigmadır. Mevcut proje Türk ve İranlı kullanıcıların bulut bilişim kabul niyetlerini etkileyen ve bulut bilişim kullanma davranışı tetikleyen faktörleri anlamayı amaçlıyor. Bu projede teknoloji kabul modelinin faktörlerinden olan Algılanan fayda, Algılanan kullanım kolaylığı, , Sübjektif Norm, Kolaylaştırıcı şartlar ve Davranışsal niyetin yansıra deneysel olarak "Algılanan Risk" ve "Uyumluluk" yapıların bulut bilişim Kullanımının nasıl etkilediğini ölçen bir teknoloji kabul modeli uyarlama testidir. Bu amaçla Türk ve İranlı kullanıcılardan veriler toplanarak incelendi. Toplanan cevapların güvenilirliğini değerlendirmek için Chranbach's alfa ve değişkenlerinin arasındaki ilgileşim değerlendirmek için Pearson korelasyon Tekniği kullanılmıştır. Teknoloji kabul modelinin orijinal yapılarının hepsi önemli bir şekilde bulut bilişim kullanımını etkilediği görüldü ama deneysel yapılar olan "Algılanan Risk" ve "Uyumluluk" kayda değer sonuçlar alamadı.

Anahtar kelimeler: Teknoloji Kabul modeli, Bulut Bilişim, Teknoloji Benimsenmesi.

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ABBREVIATIONS

TAM: Technology Acceptance Model

TRA: Theory of Reasoned Action

TPB: Theory of Planned Behavior

TOE: Technology Organization Environment

PU: Perceived Usefulness

PEU: Perceived Ease of Use

PR: Perceived Risk

SN: Subjective Norm

BI: Behavioral Intention

UB: Use Behavior

COM: Compatibility

FC: Facilitating Conditions

1. INTRODUCTION

Rapid increase in IT due to the prevalence of internet usage has changed people's life in every way. Every day people come across to new technologies related to the Internet. These changes affect the behavior of people while interacting with computers.

In the twenty first century, living without the Internet and computers is unimaginable. Thus, while the internet has become widespread in every aspect of our daily life the manner of provision of computing resources will also change in order to become easier to achieve and obtain the maximum benefit from it.

Computer giants are trying to provide better computing solutions to facilitate accessibility of the resources, decrease or optimize the expenditure and consequently increase business performance.

Nowadays IT market is one of the most powerful sectors because of its financial attractiveness--hardly a day passes without a new innovation or idea for adapting. Thus, consumers need to be up to date and have information about new innovations in order to be able to decide among them.

Cloud computing is one of the last attempts of leader computing companies for the provision of computing resources with the aim of facilitating the computing usage by changing clients' parts from thick client to thin clients. But it is not a totally new idea and it inherits many of features from past paradigms such as utility and grid computing, which also attempted to provide computing resources as utility.

For consumers in the IT market from any level, including that of the individual or organization, it is essential to have a deep understanding about new born paradigms to be able to choose the most appropriate one for them or their organization.

Being updated about innovations in the IT market will help the members achieve relative advantages of adopting the best solution. It is obvious that in such a quickly developing sector like IT those who follow the last innovations will gain profits respectively.

The main purpose of this thesis is to discuss the new born paradigm “cloud computing” to give a better understanding about the term itself, it’s advantages, concerns, and related technologies, and also investigate the most influential factors in cloud computing adoption in two similar developing populations: Iranian and Turkish people.

In this chapter an introduction about cloud computing and related technologies will be presented. It starts by providing brief explanations about previous technologies and ideas such as distributed computing, grid computing and utility computing, which can be considered the backbone of the cloud computing paradigm. Thereafter, the term cloud computing and all its related concepts will be discussed in detail. Finally, the present status of cloud computing in both Turkey and Iran will be discussed.

In following chapters, to gain better understanding about cloud computing and academic attempts in this context, relevant literature will be reviewed.

To achieve the research purpose an exploratory study will be conducted using questionnaire method and with the help of technology adoption frameworks. The framework which was considered to be suitable for the scope of this study is measured to be technology acceptance model. Finally the results of study will be analyzed and interpret and will lead us to the relative discussions and conclusions.

1.1 BACKGROUND

Since the 1940s that first computers have invented with the purpose of solving complex mathematical problems, computers have been grown almost every year and human being's life has changed along with this grown. And as Ceruzzi (2003) mentions nowadays "Computing" is the least important thing that computers do.

But after the genesis of networking in the 1960s, and relatively appearance and diffusion of internet in 1990s, computers gained much more role in everyone's daily life and have become an integral part of our daily life.

During this evaluation, different types of computing paradigms have been proposed to answer end user's needs such as Distributed computing, Grid computing, utility computing and finally cloud computing.

From this section a brief definition and exploration about each of these paradigms which was proposed before will be explained to consider the process of moving toward the idea of cloud computing.

1.1.1 Distributed Computing

As Peleg (2000) points distributed system can be considered on the contrary with a centralized system. In a non-distributed systems, there is just one single task carrying out on at any single moment. There might be idle processors while completing an action in this case the processors can communicate with each other to complete the task, but all of the processors are able to finish the task without the others ones.

Generally a distributed system is any system in which each member of the system is located on linked computers and organize their actions by passing messages to each other. In such a system Resource sharing will be the main motivating factor.

A distributed system is not a new term and it dates back to almost the introduction of computer networks. Local-area networks such as can be known as the earliest distributed systems which were invented in the 1970s.

Relatively distributed computing refers to the use of divided systems to eliminate complex computational issues. In distributed computing, a complex issue is separated into smaller parts that each of them is processed by one or more computers, while these parts are negotiate about their tasks through message passing.

With the increasing maturity of distributed systems, a number of different paradigms and terms related to distributed computing have been proposed which all promise to deliver IT as a service.

1.1.2 Grid Computing

With the growth of distributed computing the idea of using computing resources deformed. According to Foster et.al (2008) in the mid-1990s, the term Grid was proposed first to identify computing system that will let consumers to use their desired computing resources on demand. The general vision of grid computing is similar to power grids where users get access to electricity with no further information about where or how the power is generated.

In this view grid computing becomes universal and every single user can have access to any kind of computing resources such as storage, data, applications, etc. on demand without any information about where those resources are coming from or what technologies they are using to provide those resources.

1.1.3 Utility Computing

The idea of using computing resources widely in daily life led IT industry to propose utility computing. Utility computing is another computing paradigm that promises to deliver any kind of IT resources as measured services alike to the public utility services, such as electricity Foster, et al. (2008). John McCarthy posited that earlier in the 1960s that "computation may someday be organized as a public utility" so utility computing is not also a totally new term.

The concept of utility computing is quite simpler rather than preparing servers or other resources in-house, user's contract with a utility computing service provider and pay only based on the hardware and software resources they might use.

1.2 CLOUD COMPUTING

Finally the last proposed computing paradigm with the aim of delivering computing resources as a service is cloud computing. The term cloud can be assumed as the internet. Which means the scope of services are as wide as the internet itself.

Cloud computing cannot be counted as a completely new technology, it has relation to the Grid computing paradigm, and other older technologies with the same aim such as utility computing and distributed systems. (Foster et al., 2008)

The first attempts of creation of cloud computing can be tracked back to 1997 but in recent years with the maturity of IT and ICT market it's become a quiet trendy term. Me, et.al, (2008)

As it might imply from its name, the term “cloud” basically means the idea of enabling users to access computing resources from anywhere from any device on demand. There are many different definitions of cloud computing from different authors in different studies seeking to describe the cloud computing concept relying on its characteristics or the services it offers. For instance (Armbrust et al., 2010) defined cloud computing as, the applications delivered as services through the Internet and also the hardware and software in the datacenters that provide those services.

Buya, et.al (2008) posits that cloud is a kind of distributed system which has been consisting of a set of linked and virtualized computers. These computers are provided as computing services based on the SLA between the service provider and service consumer.

Some authors posit that there is no single definition of cloud computing. And each of them described cloud computing as they perceive it .As there are various types of definitions, Vaquero, et.al (2008) tried to gather all of these definitions and analysis them in their study

to obtain a unified definition of cloud computing. Finally, they propose the following definition:

Cloud computing is a pool of virtualized computing resources which is easy to use and available. These resources in clouds can be elastically redesign based on customer's requirement, to enable consumers for maximum service usage. The consumers will be able to use the resources and pay the bills based on pay-per-use billing model.

Meanwhile the US National Institute of Standards and Technology (NIST) has defined cloud computing and its essential characteristics, Service models and deployment models seeking to provide a comprehensive definition which has covered all the aspects of cloud computing. This definition is now known as the most creditable description which was also agreed by most of the researchers and theorists.

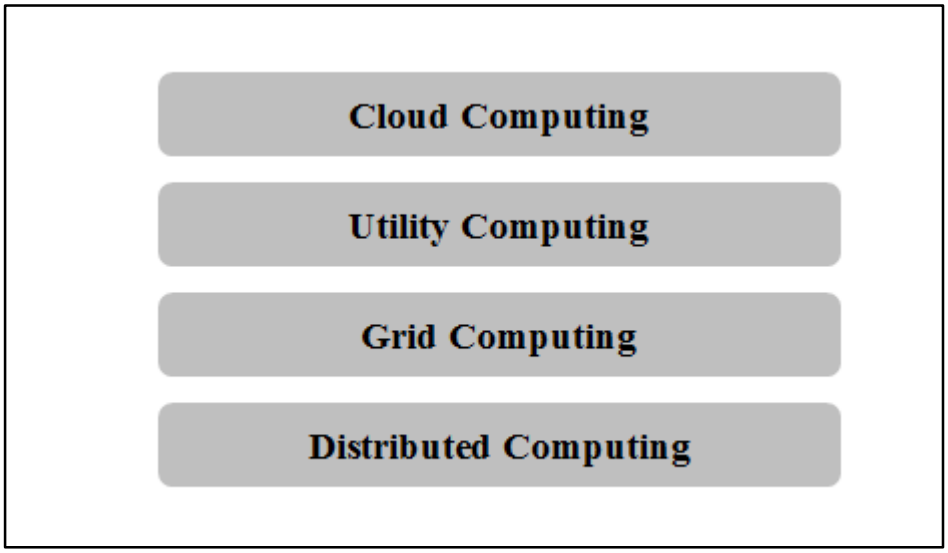
According to NIST Cloud computing is a new computing paradigm which enables users to access to the resources from anywhere anytime, based on their needs. Customers can have access to a pool of any kind of computing resources including software, hardware, storage etc. these resources can dynamically be provided with minimum human interaction and man effort. Cloud computing paradigm has five essential characteristics**,** four different deployment models and three distinct service models. (Mell & Grance, 2009)

As it might be perceived, actually the definition of cloud computing is so similar to distributed, grid and utility computing. In fact the terms are largely synonymous and it is difficult to draw exact borders between these paradigms. Some authors believe that grid, utility and cloud computing are actually referring to the same thing or maybe they are different stages of the process of the same idea and some others believe there are only small differences among them, while others would claim they refer to completely different paradigms.

According to Foster et al. (2008) Cloud computing is a specialized form of distributed computing paradigm. Grid computing can also be viewed as a form of cloud computing. Cloud computing not only is similar in definitions, but also it can be counted as an improved paradigm based on grid computing and its inherited basic ideas and some technologies from grid computing.

The vision for these computing paradigms are all so similar, but there could be some differences in the details and technologies may each one have used, but the concerns both providers and users are dealing with are almost the same. The advantages they offer and drawback users and providers might face are more and less the same such as reduction of the costs and increment of the flexibility and reliability by using third-party operated hardware. So roughly we can say that other computing paradigms can generally be viewed as a precursor to the more general paradigm of cloud computing.

Figure1.1: Technologies used in the process toward cloud computing



Source: Prepared by Parastoo Dashti

1.2.1 Cloud Computing Characteristics

The influential effects of cloud computing in the economy have been proved by developed countries such as Australia, Germany and Us. Thus there is an intense attention to deploy this technology in national level. Cloud computing has unique characteristics that make it worthwhile to invest. The five essential characteristics of cloud computing named and defined in NIST report as:

On-demand self-service

Cloud services make the consumers able to use any kind of computing services such as email, applications, network storage and etc. with no need for human interaction with each service provider. This characteristic improves the cost savings for consumers by using as much as they need and pay as they use. Similarly for service providers it will cause a reduction in the number of staff that is required to give a service to customers.

Broad network access

This characteristic emphasizes that cloud computing services are available over a broad band network which is mostly internet and can be accessed by using some any kind of client platforms such as mobile phones and laptops, tablets and etc.

Resource pooling

By using technologies like virtualization the providers pool their computing resources to serve to various consumers. These services can dynamically be change according to consumer request. The resource location is not known by consumers. They also might have restriction on control over resources depending on the scope of and the level of service they are using and the agreement they have with a service provider.

Rapid elasticity

Using this characteristic of cloud computing enables service providers to expand the services based on consumer demand. Service providers often provide infinite capabilities to the consumers. These capabilities can be allocated to consumer with any amount at any time. This flexibility in scale of providing service is one of the fundamental characteristics of cloud computing. Users can request additional services whenever they need likewise they can ask for a reduction of the service when they need less. This will enable customers to control their expenditure and gain cost benefits.

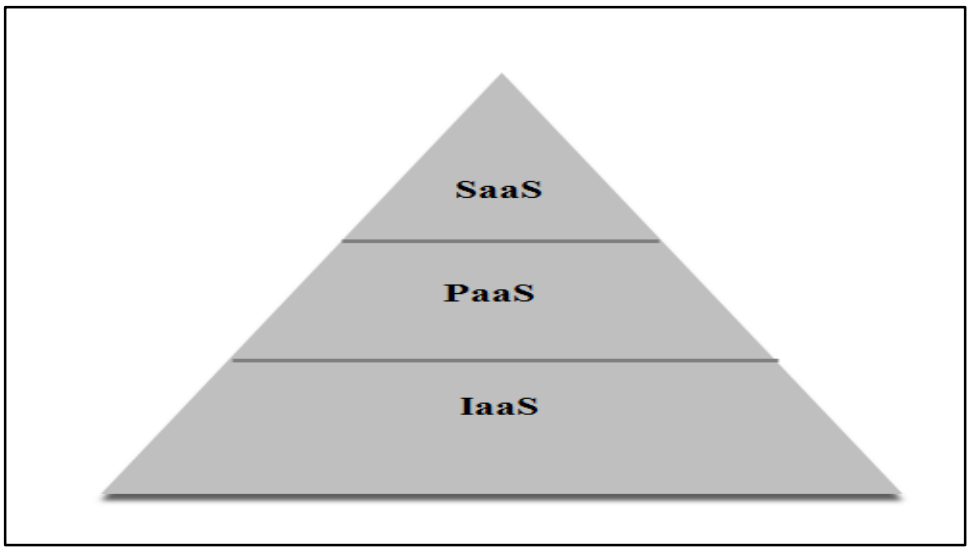
Measured service

Cloud computing services and capabilities are controlled, measured by service providers depending on the type of the services that is used. Any kind of computing service that is provided such as software, hardware, storage or processing, and active user accounts can be measured for this aim. For this aim service provider leverages a metering capability of the system. Using this characteristic of cloud computing will bring clearness for both service provider and client in interaction. (Mell & Grance, 2009)

1.2.2 Cloud Service Models

Consumers can benefit from different service models of cloud computing depends on the level of r computing resources or service they may require, there are 3 fundamental types of service models identified as cloud computing service models including Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS). Structure of cloud computing also can be determined by understanding the layers of abstraction. The following figure defines the layered structure of the cloud from a very base level, which is IaaS to the high level of applications.

Figure1.2: Layered Structure of Cloud Computing



Source: Gartner AADI (2009)

Infrastructure as a Service (IaaS)

At this level of service provision, which is the base level of cloud computing, consumers can access the basic computing infrastructure, including the operating systems, network, virtual computers, servers, storage devices, etc. through a service provider without the need

to deal with any detail about an establishment, maintenance or support because they do not control the cloud infrastructure themselves. So it's not only the computing power that will be outsourced anymore at this level of service the combination of both computing and storage will be hosted by the provider. Amazon EC2, Windows Azure, Rackspace, and Google Compute Engine are some examples of leading IaaS providers.

Platform as a Service (PaaS)

This level of service enables developers to access to the required development environment or platforms in order to develop and deploy their own software and applications in the cloud. PaaS comes in the middle of the pyramid indicating that the responsibilities, user takes are in the mid-level. For instance, unlike IaaS in this level the heavy hardware responsibilities of IaaS are not the concern, but also its user, who is responsible for the software which is the user's code different that the SaaS level where the user is dependent on the service provider.

The operating systems and network access are not managed by the consumer, and there might be constraints as to which applications can be deployed. AWS Elastic Beanstalk, Windows Azure, Heroku, Force.com, and Google App Engine are some of examples of platform as a service providers.

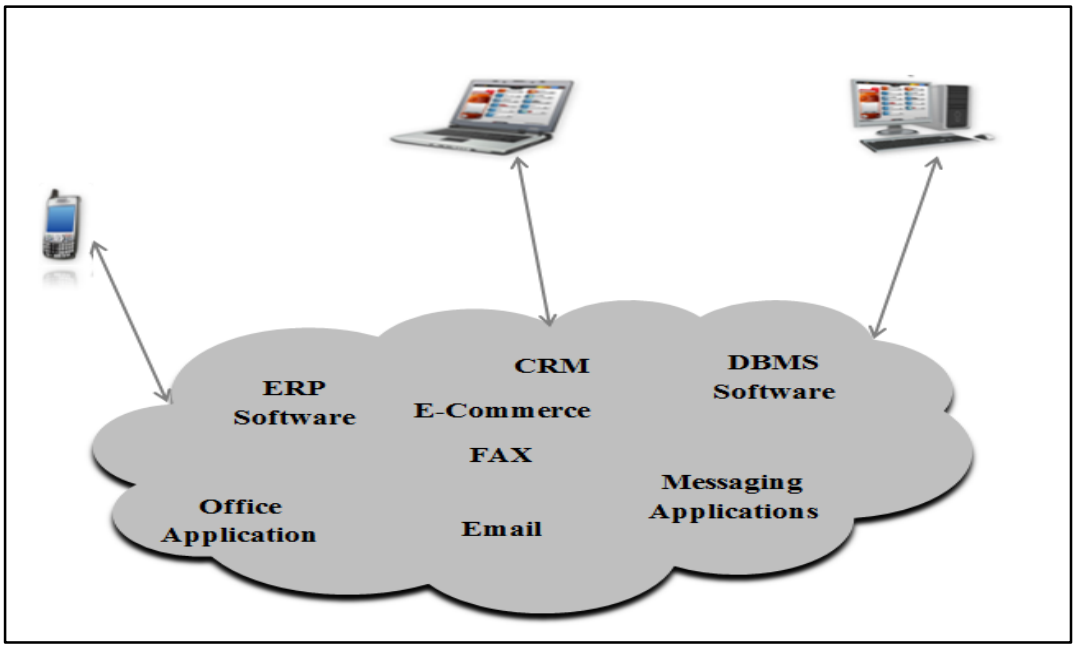
Software as a Service (SaaS)

The most known service model and highest level of cloud computing is the Software as a Service. The reason could be that this level of service appeals to a wide range of user form an unskilled user that sometimes even isn't aware of the term cloud computing to a fully skilled computer specialist. All the software applications that are only available online are in SaaS category.

Via this level of service, applications can be accessed through a network from various clients such as any kind of web browser, mobile phone, tablets, etc. without no need for consumers to be concerned about software licenses, installing and maintaining. The most known example of SaaS is email that users select from a free web-based e-mail server such as Google's Gmail, Yahoo! Mail, or Microsoft's Hotmail, instead of establishing on their internet service provider. Users don't need to think about any detail and start benefiting from the service instantly.

In utilizing SaaS software updates are provided by the service provider itself automatically so being up to date is not a concern for users anymore .It also provides easier collaborative manner with team members or other users who are working on a common project from anywhere via any device . They can share files and documents, work simultaneously and update their version of files or documents the revisions will be applied to all of the files and since everyone has access to the same version of the software.

Figure1.3: Software as a Service Model



Source: Prepared by Parastoo Dashti

Obviously, users are not bound to their devices any more or a specific location, they can access the software from anywhere with any device and just a browser or other client device and network connectivity is enough to start using SaaS. Some other examples of this level of service are Google Apps, Microsoft Office 365, cloud, Dropbox, Google Drive, mediaFire and salesforce.com (CRM).Figure 1.2 depicts software as a service model.

Internet service providers offer also some other services to their users including storage as a service (STaaS), security as a service (SECaaS), test environment as a service (TEaaS), and many others but these services are rare in comparison with three fundamental service model that were already introduced.

1.2.3 Cloud Computing Deployment Models

To use cloud computing services on organization level users can deploy their own cloud in different ways depending on the organizational structure, vision and the service provider location. Four most known deployment models are namely public, private, community and hybrid cloud. Each of the deployment models has some advantages and disadvantages along with them, therefore decision makers should be able to distinguish them with each other in order to choose the most appropriate one for their organization.

Public Cloud

A public cloud is a cloud computing deployment model in which services, such as applications, infrastructure and storage, are provided for public utilization over the Internet. This service can be provided as free of charge or as pay-per-use basis. IBM's Blue Cloud is an example of a public cloud is IBM's Blue Cloud.

Actually the public cloud deployment model is the deployment model which can be interpret as true cloud computing. It can help to reduce capital cost and bring down operational IT costs, but it might cause some security and privacy risk for organizations as

well. Hence, organizations can maximize their cost efficiencies by using public cloud services for non-sensitive operations, and using private cloud only when dealing with sensitive operations.

Private Cloud

During organizations initial adaptation of the cloud, there are many challenges and concerns related to data security and privacy. Private cloud deployment model was proposed to meet these requirements. In this term, the private cloud deployment model is implemented and operated within the organization under the control of its own IT department. Private clouds are designed to enable consumers to take advantage of public cloud's benefits along with providing more control of resources and security for organization.

In this model the cloud is provided just for exclusive use. An organization which has variety consumers can use this deployment model to provide services for its own consumers or employees. This model doesn't provide real financial benefits because it is alike buying, building and managing your own resources.

Community Cloud

Community cloud is a deployment model that the cloud infrastructure is shared with a couple of organizations or employees with common computing concerns and requirement or a community who are working on common projects. This model is suitable for organizations which are working in the team manner.

Hybrid Cloud

As mentioned above private, public and community clouds all have different Strengths and weaknesses which should be considered during cloud deployment process. The hybrid

cloud deployment model has been suggested for those consumers who want to take advantages of each model's strengths and discard their weaknesses. In other word hybrid cloud is a combination of two or more distinct clouds (private or public).

1.2.4 Cloud Computing Billing Models

Billing issue is so critical in adoption of any kind of new born technologies. In order to enable a technology to be adopted by both market and clients should gain a reasonable amount of financial benefits and decrease cost. In cloud computing adoption it is even more important because the primary goal of adopting cloud computing for users will be maximizing benefits and minimizing the cost.

Flexible payment models are one of the basic differences of cloud computing with traditional computing models. With adopting cloud computing service users will be able to start to gain benefits instantly without investing on in-house systems.

Due to the importance of this issue there are many studies in literature about various Billing models for cloud computing services which all of them are seeking to provide a more beneficial Billing model for both users and providers. Al-Roomi, et al. (2013) have considered and compared some of the Billing models in their study briefly to give an understanding to both service providers and service consumers.

There are various Billing models to utilize. For instance, the common Billing technique is to pay once for infinite usage, but this approach is not flexible enough. Cloud service providers are utilizing different Billing models in order to provide a flexible price for their users. The most popular Billing models are Pay-as-you-go and Subscription models.

Pay-as-you-go

The most common Billing model is pay per use or Pay as you go in which a customer need to pay based on their overall resource utilization. Most of the main cloud computing service

providers such as Amazon EC2, Microsoft Windows Azure and Google App Engine are using this model.

Subscription

The other main billing model is subscription. In this model, consumers subscribe to use a service provider for a specific or combination of services for an appointed price and fixed time period such as monthly or yearly. Users need to choose the most appropriate Billing model based on their budget and resource consumption they might have. After determining the suitable Billing model the Service level agreement (SLA) needs to be provided between service provider and service consumer. SLA describes the details of the provided services and each Parties' responsibilities.

1.2.5 Cloud Computing Advantages

While evaluating an innovative technology to adopt, consumers require a vast knowledge about the advantages it brings and the problems it may cause. But especially among common people concept of cloud computing is not well understood yet. In this part of this study potential advantages of adopting cloud computing will be explained to give an objective point of view about cloud computing.

Time and Location Independency

Time and Location independency is one of the major benefits of cloud based services definitely. In cloud the services are provided through the Internet. Therefore, regardless of the device, location and time services are accessible by using just a broadband network and any kind of devices that simply has a web browser. This feature enables users to work from anywhere by using any device. This feature affects the productivity and effectiveness of users in their job relatively because users are not bound to a specific situation or condition to work.

Enhanced Collaboration

As mentioned cloud computing enhances the collaboration among team members who are working on the same project due to the independence it brings for users. Utilizing cloud based services enable users to share their data and information. They also can work on the same project through shared software independent from each other but fully organized.

Cost Efficacy

Cost efficacy is also the other advantage of cloud computing. Migrating to the cloud can provide. Most of the clouds computing service providers claim that adopting cloud computing services will bring significant cost savings for organization or generally users.
These cost savings are considered due to the elimination of initial operational and infrastructure cost, hardware and software purchase and the cost of keeping the software up to date and maintenance cost.

Obviously to be able to use the cost advantages cloud offers consumers should choose the most appropriate model of service and Billing model foremost as mentioned earlier

Disaster Recovery

Cloud service providers claim that cloud computing system provides a mechanism for automated backups to keep the system stable in any disaster event. Data in clouds are stored in different geographical regions and the backup versions also are stored separately in different places actually this recovery feature may raise relative privacy and security questions itself, but disaster recovery has always been one the most relied advantages of usage of cloud computing.

1.2.6 Concern and Challenges

There have been always worried about the applicability of the idea of utility computing, which can include cloud computing services as well. Since the idea has proposed back in the 1960s, there were always criticisms about implementation of cloud computing.

Security Concerns:

The biggest criticism about applicability of cloud computing in large scale is security concerns. Data privacy and security is the biggest challenge for service providers. Despite the fact that there is various solutions that has proposed to solve such problems, but consumers doesn't seem still convinced enough to adopt cloud computing for sensitive presses or data.

Depending on the service model that is being used by the customer there are trade-offs in terms of security. The magnitude of security responsibilities for both provider and consumer varies between cloud service levels. Generally the more customer extensible the service model is the more security risk it bears. Therefore, as SaaS provides the least consumer extensibility it has the highest level of security. Relatively as PaaS is more extensible than SaaS it will provide a higher level of security issues. IaaS provides few enormous extensibility, which means less security capabilities and customer is responsible for securing the operating systems, applications, and content.

For customers who are seeking to use any service model of cloud computing or develop a cloud system, it is essential to recognize all the security facets. The cloud Security alliance provides a Security Guidance for Critical Areas of Focus in Cloud Computing to help customers to manage the security risks while using cloud computing in any level.

Legal Issues

Legal issues are also an important concern for adapting to cloud computing. The idea of storing your data in external datacenters that you are not even aware of the exact location of

them is doubtful for users. Thus, there should be strict legal procedures to guarantee the safety of the system to users.

Cyber lows are provided in most of the developed country's legal system. But there are still some worries about coverage of all aspects of security concern of them. Whereas in developing countries, mostly this kind of loss is not provided yet. Another concern that may arise is the data centers that users' data are stored, are located in different geographical places all over the world so in the case of any difficulty which country’s low system will be responsible to answer conflicts. Hence, international law or legal system is needed for such a system to be able to establish a real secure and protected computing system which doesn’t exist yet.

Availability

Not all of the internet users have access to high speed internet connection. Especially in some of the developing and underdeveloped countries this problem is an important barrier for cloud computing adoption. As mentioned, one of the essential characteristics of cloud computing is a broad network access and obviously the lack of reliable network access will be a concern for potential users.

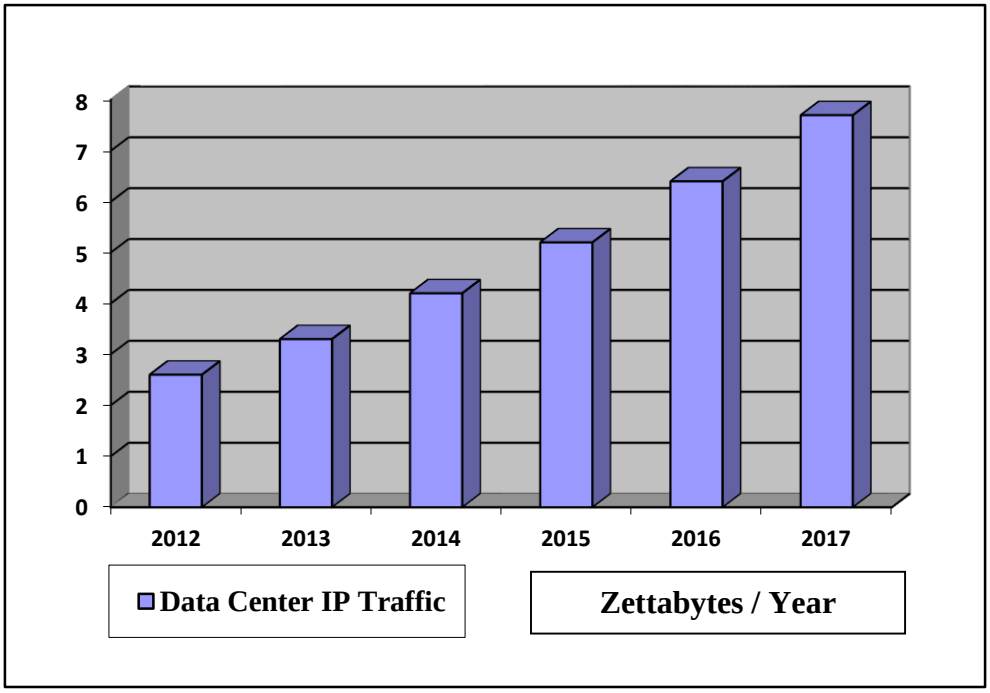
Reliability

Reliability of service providers and the services provided by them is another concern for cloud computing potential users. By adopting cloud based services, service consumers will be dependent to the service providers in different levels based on the service they might use this dependency to a third party raises reliability concern for service consumers.

1.3 CLOUD COMPUTING STATUS

Cloud computing is relatively new paradigm but despite this fact, the usage of it is everyday increasing every day. As The Cisco Global Cloud Index claims by 2017, approximately two-thirds of all workloads will be processed in the cloud.

Figure1.4: Global data center IP traffic growth



Source: Sisco (2013)

In order to be able to consider the factors which can affect the acceptance of cloud computing among users the recent status of this paradigm should be derived. In this section the current status of cloud computing in the world and specially Turkey and Iran separately are posited.

However, the walk up to cloud computing adoption in developing countries such as Turkey and Iran will be different comparing to developed countries. Actually, cloud computing adoption can bring more advantages to countries with smaller economies than developed countries, because of its initial operation cost savings but still it can be challenging.

As Turkey and Iran are two countries under investigation in the scope of this study a brief explanation about the ICT market status and cloud computing adoption will be discussed here.

1.3.2 Cloud Computing in Turkey

Turkey is one of most developing countries in the world in recent years. Due to its geopolitical location which is so sensitive because of being the gate of the Middle East it can play a powerful role in both regions and benefit from both of them.

The percentage of internet usage in Turkey was reported by the World Bank until 2012 as 45.1 which shows a significant increment comparing to previous years. As internet usage and broad network access are very important factors for cloud computing services to be applied, this increment will help to smooth the adoption of cloud computing.

Because of its developing economy and growth in turkey's ICT system, there is an intense interest toward cloud computing especially in the public sector in Turkey. There are many local companies that are providing various local services in different levels. Turk Telekom as one of the leading public internet service providers has various cloud services at different levels for individual and organizational consumers. There are also private companies who provide cloud based services such as Vodafone and Turkcell.

The business software alliance rated turkey at 17 among 24 countries in the ranking of countries which are effective in the expansion of cloud computing. In this consideration the analysis is categorized under seven main groups that are essential for the growth of cloud computing including: Data Privacy and Security, Cybercrime, Intellectual Property, Standards/Int'l Harmonization of Rules, Promoting Free Trade, ICT Readiness, and Broadband Deployment. BSA (2012).

1.3.3 Cloud Computing in Iran

Iran is one of the most powerful countries as the population and economy in the world. According to World Bank's 2014 report of gross domestic product (GDP) Iran is in 21'Th of the world order with 552,397 million of US dollars. Which shows an increment compared with last years.

As population, Iran also can be considered one of the strongest countries with more than 76 million population, which more than half of this number are under 30 years old. Considering the young population of Iran it is obvious that the usage of ICT products and services has been always increasing during past years.

The Iranian ICT market is largely government monopoly and the government is investing a great amount of support in recent years to improve the Information and Communication Technology (ICT) infrastructure of the country to be able to establish E-government services.

The actual form of the ICT ministry of Iran first published in 1929 with communication approaches such as post, telegraph, telephone. Later in 1993 Iran connected to the Internet as one of the first countries in the Middle East and since 1995 public usage of the internet started in Iran .But the range of internet quality remains weak in compression with other developing countries. Also the price of internet assessment is high relative to its quality.

Lately ISPs in Tehran offer maximum 2Mbit/s for about 4,000,000 riyals per month (around 400 dollars per month) for unlimited data traffic. And of course the prices in other cities are higher in other and quality is lower.

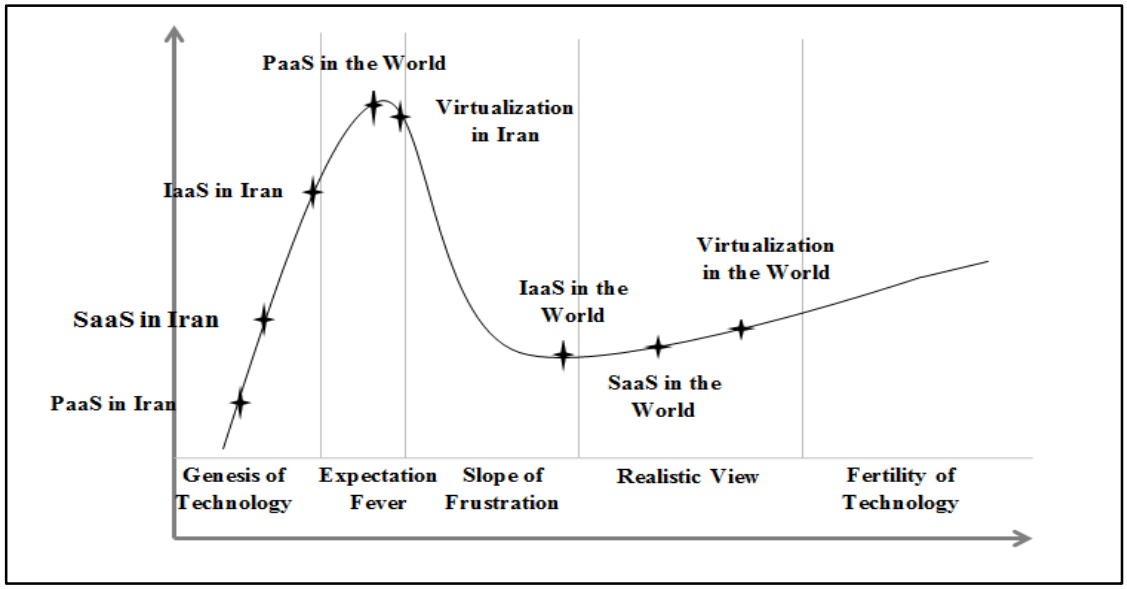
According to internet world stats website's report in 2012 on internet usage based on population states in the whole Middle East is less than 100 million users.

The percentage of internet usage in Iran was reported by the World Bank until 2012 as 26.0 which shows an increment comparing to previous years. Therefore, the employment of cloud computing would be a longer process in comparison with the world and Turkey particularly due to infrastructural immaturity. But the process started and it is a trending topic in universities for research and although rare, but people are using it in their daily life.

There are a few local cloud service providers in Iran who are offering cloud services in all the levels, such as Irancell and Parspack but due to lack of significant infrastructure and legal issues they are in the early stage of working. Due to this reason Iranian users mostly prefer to use foreigner services providing by leading service providers.

Amir-Kabir University of technology has established a cloud research center with the aim of centralization of cloud computing based research and turning it to more practical aspects by gathering all people who are active in this area in one place to share their experiences and studies. They recently have published a report about the Status of some cloud computing related technologies in comparison with the world. (Javan, 2013)

Figure 1.5 Comparison of cloud computing status the world and Iran



Source: Javan (2013)

As it seems in the Figure1.5, status of IaaS, PaaS and SaaS is at the level of the genesis of the technology in Iran. However PaaS in the world is in expectoration fever stag, IaaS in the slope of frustration and SaaS is in the realistic viewpoint. Virtualization as one of the technologies that is important for establishment of the cloud based services, is on the slope of frustration in Iran while this technology is in the realistic view phase.

However, due to the deficiencies and problems in developing countries such as Turkey and Iran, the process of cloud computing adoption needs provisioning field studies and researches in depth about each country's status, existing infrastructure, policies and governmental support.

2. LITURATURE REVIEW

In this section a summary of past researches in the literature aligns with current study is provided to gain an objective view of the issue. The different technology adoption frameworks were considered and evaluated to decide which one will be more appropriate for the current study. The previous studies in cloud computing adoption context were also analyzed to gain an insight of other researchers.

2.1 TECHNOLOGY ADOPTION FRAMEWORKS

There are many theoretical models in the literature which was proposed to measure user acceptance and adoption of innovative information technologies, each with different points of view and focused areas. They have been tested in various contexts and countries. In this part four of the most important frameworks that have been used in Information Systems researches will be explored briefly. The aim is to have an understanding about them and state which one and why have been chosen for this study.

2.1.1 Theory of Reasoned Action (TRA)

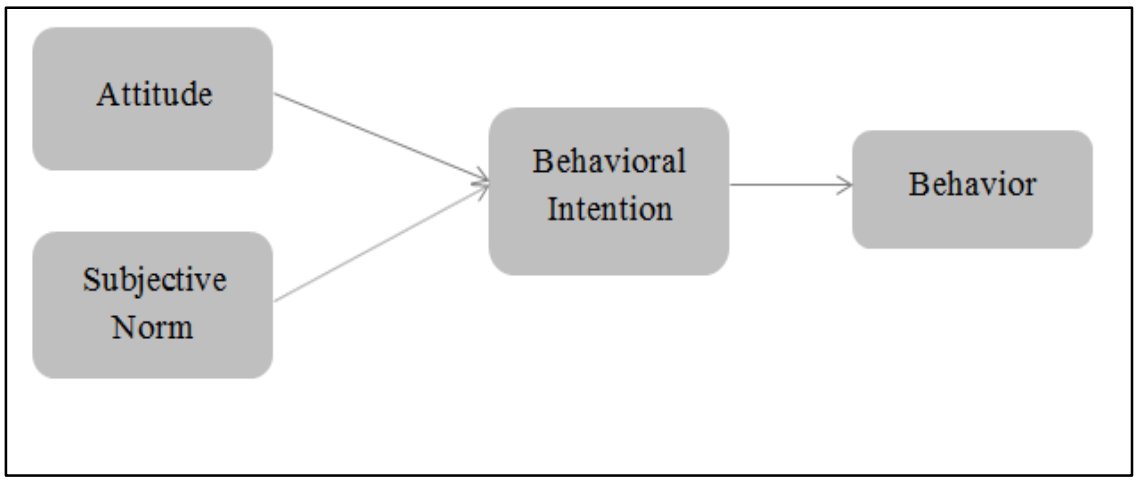
Fishbein and Ajzen have proposed and validated the Theory of reasoned. This theory posits that attitude and subjective norm will affect one's behavioral intention to accept or reject a new system where intention itself will affect the behavior of the individual. Fishbein & Ajzen, (1975).

One of the independent constructs in TRA framework is subjective norm, which is specified as and the effect the impressive or important people would have on individual perception about whether or not to perform a specific behavior or not.

The other independent construct is the attitude towards behavior which is individual's feelings that can be both positive and negative about performing an attitude which is

determined by and evaluations of the individual's belief on performing an attitude and the desirability of the outcomes. The following figure depicts the Theory of Reasoned Action.

Figure2.1: The Theory of Reasoned Action



Source : Fishbein & Ajzen (1975)

2.1.2 Theory of Planned Behavior

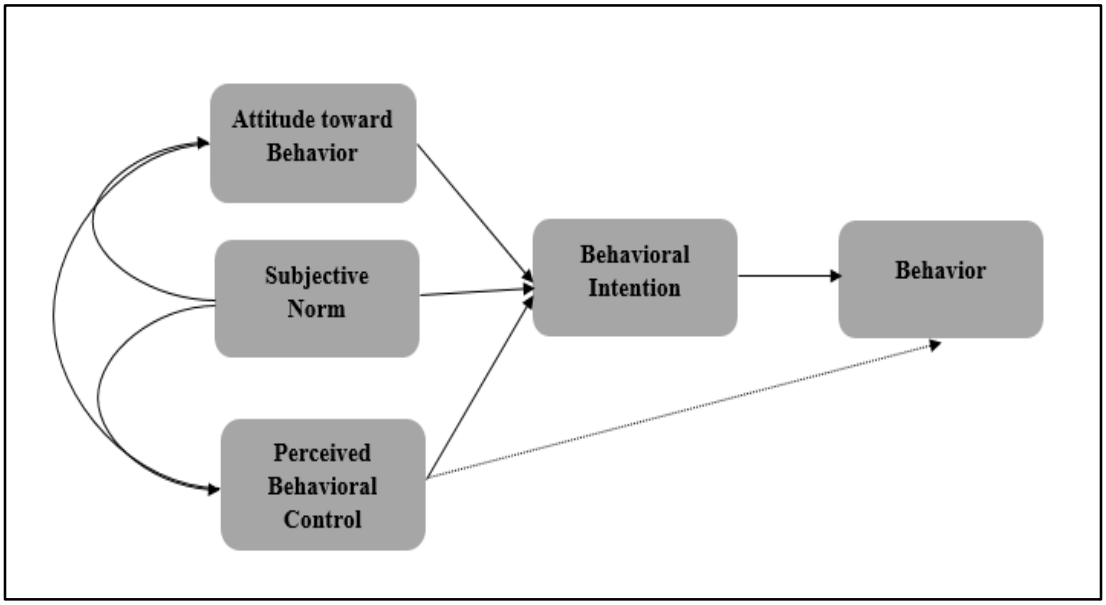
Theory of planned behavior was suggested by (Ajzen, 1991). It is developed in continuation of the theory of reasoned action (TRA). TPB tries to understand how people behave toward adopting or refusing a specific behavior. He defines antecedents of TPB as Subjective norm, Attitude toward behavior and the dependent factor which is perceived behavioral control.

In this model behavioral intention and behavior are dependent Constructs and Subjective norm, Attitude toward behavior and perceived behavioral control are the independent Constructs.

TPB model posits that people's behavior can be affected by behavioral intentions and the behavioral intention itself will be affected by the user's attitude toward the behavior, the

subjective norms and the behavioral control. How likely individuals are to perform a behavior is defined as intention. Attitude toward behavior was described as one's own evaluation of outcomes that performing a particular behavior may lead. Subjective norm is the effect of community on user about the decision that he takes to either performing a behavior or not. The perceived ease of performing a behavior is described as Behavioral control. The following figure shows the theory of planned behavior.

Figure2.2: The Theory of Planned Behavior



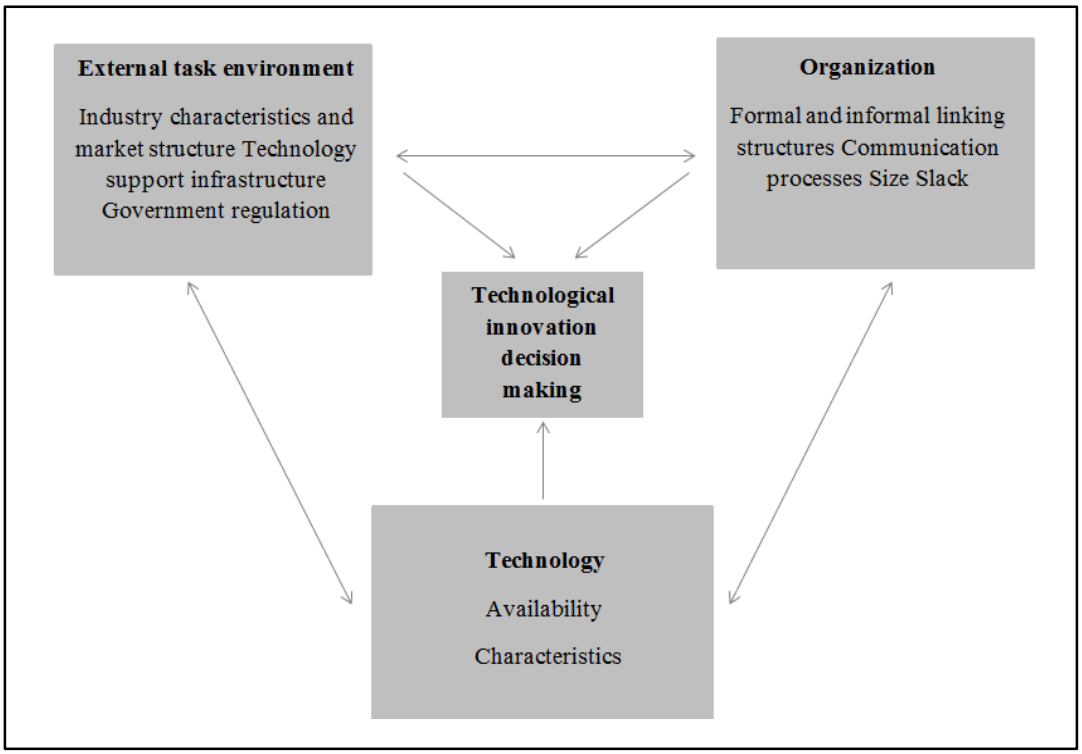
Source: Ajzen (1991)

2.1.3 Technology Organization Environment

Technology organization environment (TOE) framework which was proposed by Tornatzky et.al (1990) is one of the most well-known frameworks in the technology adoption area. This model has been applied to many technologies to predict the relative adoption in firm level.

The TOE framework posits that there are three distinct factors that might have an impact on the process of technology adoption in an organization, including Technological factors, Organizational factors and the Environmental Factors.

Figure2.3: The Technology-Organization-Environment Framework



Source: Tornatzky et.al (1990)

The organizational factors refer to the organization's attributes that can affect the adoption of technology such as management structures, organization size, communication processes, and so on.

The technological factors refer to accessibility to the technologies for an organization and how these technologies might affect the acceptance. The environmental factors are related to industry characteristics, technology support abilities, competitor's situation and legal issues (Tornatzky et al. 1990).

TOE framework analyses technology adoption in organizational level so it was not appropriate for this study because the target population in the scope of this study was considered to be individuals.

2.1.4 Technology Acceptance Model

TAM is one of the major theories in the technology adoption area. Davis first proposed this model in 1989 with the purpose of instructing better measures for predicting the use behavior.

Technology acceptance model (TAM) is also adopted from TRA. This model posits that intention to use a technology will affect the actual use behavior of that technology through two independent factors namely perceived ease of use and perceived usefulness. Davis (1989)

Since 1989 TAM has been used in plenty of studies to determine the acceptance of different technologies and the factors that may have influence on it. Some of the most creditable ones are considered in depth to have an insight about the process in front.

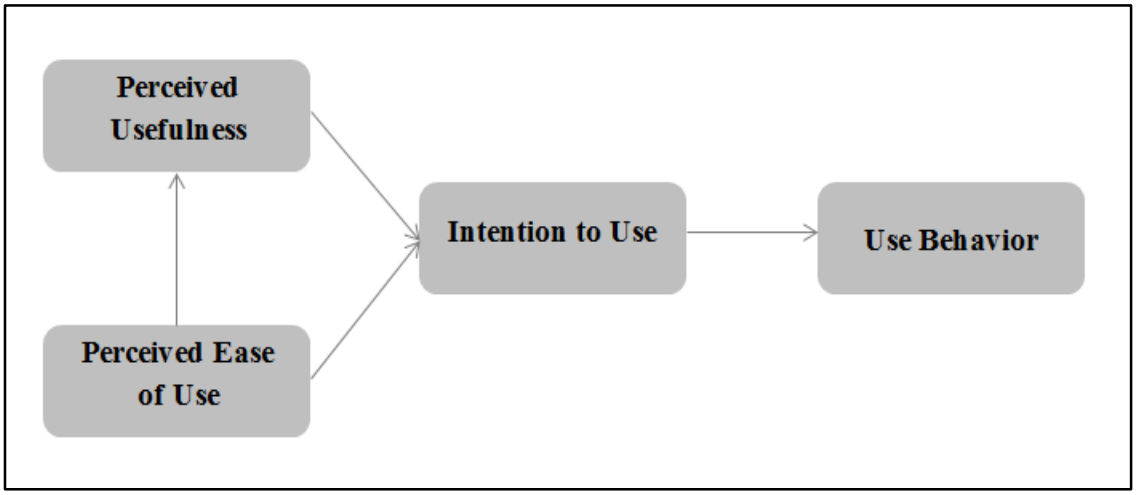
Most of the named studies have used technology acceptance model's variables, but some of them has extended the TAM by adding extra factors among them trust, risk, compatibility and quality of service can be named.

As an good example of TAM extension, Lu, Yu, et.al, (2003) developed an acceptable model for wireless Internet. They extend TAM by adding external constructs, including technology complexity, individual differences, facilitating conditions, social influences, wireless trust environment.

Father J. -H. Wu & Wang (2005) used an extended version of TAM with combination of innovation diffusion theory. Perceived risk and cost was added into the TAM to investigate what determines user mobile commerce adoption.

The adoption of Internet banking by retail customers in Hong Kong was investigated by Yiu, et.al (2007). They explore influences of TAM constructs namely perceived usefulness, perceived ease of use along with some additional constructs including perceived risk and personal innovativeness. The following figure illustrates technology acceptance model.
The suggestion about the impact of usefulness on system use was belong to Schultz & Slevin (1973) but afterward, Davis defines Perceived usefulness in his study as the degree to which an individual evaluating a new technology feels that using a technology might increase his performance.

Figure2.4: Technology Acceptance Model Framework



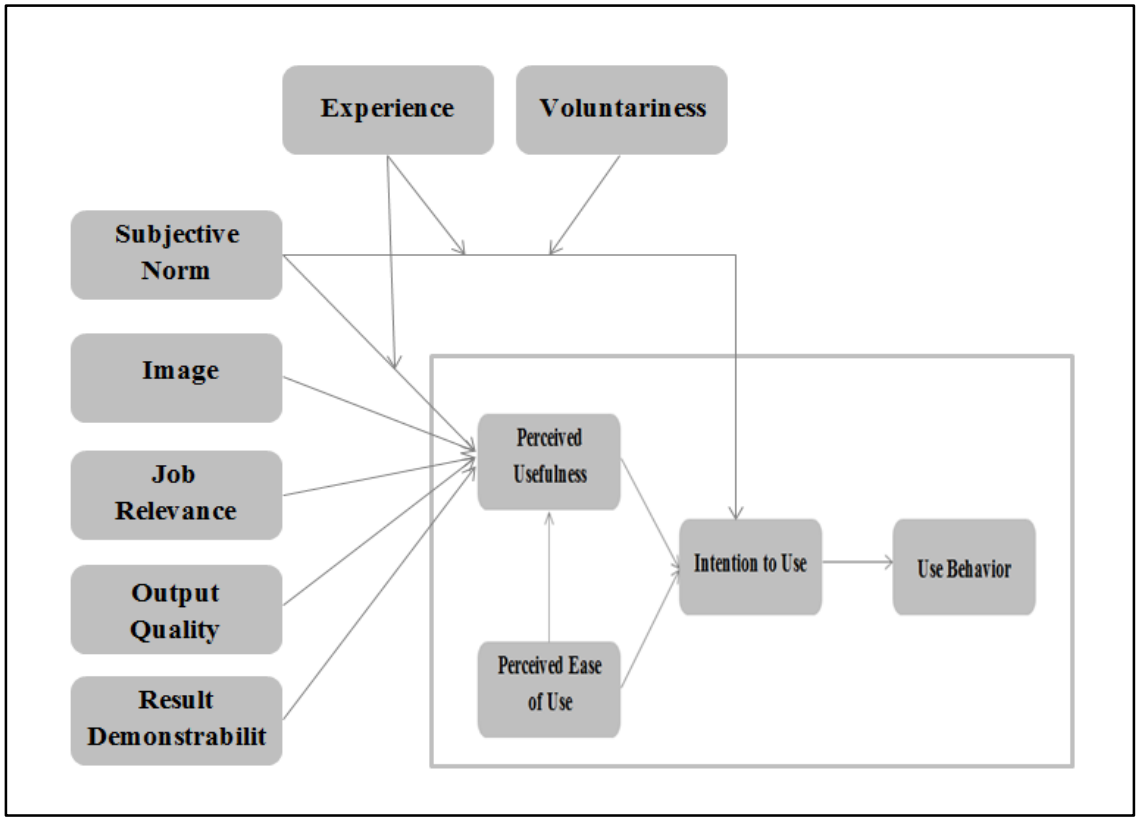
Source: Davis (1989)

He also defines Perceived ease of use construct based on the definition of "ease" word and. Perceived ease of use was described as the degree to which an individual evaluating a new technology feels that using that technology will be easy for him.

As Davis (1989) points out, PEOU can be considered as antecedent of PU rather than being on the same level with it. He also posits that usefulness has stronger relation with usage behavior than ease of use.

TAM has been extended during years by different authors. Venkatesh & Davis (2000) extended the model to append the determinants of Perceived Usefulness and Perceived Ease of Use. This model has named TAM 2. The following figure illustrates technology acceptance model 2.

Figure2.5: Technology Acceptance Model 2



Source: Venkatesh & Davis (2000)

They added subsets of Perceived Usefulness as external factors which will have influence on intention and use behavior through perceived usefulness. These factors, namely are Result Demonstrability, Output quality, Job relevance, Image and Subjective Norm. Subjective Norm itself is moderated by two other factors as Experience and voluntariness.

Subjective norm is the degree that a user feels that the important people in his community think he should or should not use a particular the technology. The image has defined as the degree to which a user thinks that the use of a technology will increase his or her status in his or her community. Job relevance is the degree to which a user feels that a technology might be appropriate to his or her job. Output quality is the degree to which an individual feels that a technology delivers satisfactory outcomes. Result demonstrability has defined as the degree to which an individual feels that the outcomes of using a specific technology are observable.

2.2 PREVIOUS STUDIES

As mentioned earlier, there are many researchers in the literature considering the acceptance of information technologies in various fields. Different factors which have significant impact on consumers are identified and validated by them.

But as cloud computing is a new trend there is not lots of valid studies in this field. Also, when considering cloud computing adoption in two dimensions as an organization and individual level the studies that have been done in individual level are rarer.

Khajeh-Hosseini, et.al (2010) conducted a case study to indicate the potential benefits and risks regarding of migrating of their IT system to Amazon EC2. They provide a Cloud Adoption Toolkit to help managers with the challenges they might face when evaluating if the adoption of cloud computing in their organizations would be beneficial or not. Later in 2012 Khajeh-Hosseini, et.al (2012). They proposed five tools/techniques are potentially useful for decision makers in the period of migration, including: Technology Suitability Analysis, Energy Consumption Analysis, Stakeholder Impact Analysis, Responsibility Modeling and Cost Modeling.

Low, et al. (2011) investigated the influential factors for the adoption of cloud computing by organizations in high-tech industry in Taiwan. The factors that investigated in this study were relative advantage, complexity, compatibility, top management support, firm size, technology readiness, competitive pressure, and trading partner pressure. Their study was supported by Technology-Organization-Environment framework and according to their study's result five influential factors for cloud computing adoption were found to be namely: relative advantage, top management support, firm size, competitive pressure, and trading partner power.

The factors that will lead to technology adoption of a cloud computing platform in rural and urban community college was to investigate in Behrend (2011) study using technology acceptance model 3. They examined the actual usage and future intentions as well. They

found that Access to Software, Ease of Travel, Personal Innovativeness, Technology Anxiety. Instructor Support and Reliability affect Actual Usage, Intention for future use and Future Usage through affecting Perceived Usefulness and Perceived Ease of Use. Based on the obtained results, customers' property such as their ability to travel to campus had affected the perceived usefulness degree, and ease of use was found by to be affected by their experiences with the environment, and educator support.

Similar to current study, Lin & Chen (2012) investigated how cloud computing is understood and concerns about adopting cloud computing by IT professionals in Taiwan. But their approach differently was Diffusion of Innovation. Based on the findings of their study, the primary concerns that IT professionals have about adopting cloud computing services is the compatibility of the cloud with companies' policy, IS development environment, and business needs; and relative advantages of adopting cloud solutions and most of the Taiwanese IT organizations in will not move to cloud computing unless concerns about cloud computing is being solved.

W. -W. Wu, et al. (2011) proposed an adoption model using Decision Making Trial and Evaluation Laboratory (DEMATEL) approach and divide perceived benefits and perceived risks as two different dimensions to help the decision makers to see be able to consider positive and negative points of adopting SaaS.

Similarly Park & Ryoo (2013) investigated cloud computing adoption in their study by categorizing the influential factors to two dimensions as switching enablers and switching inhibitors based on the two-factor theory. And finally they find out that user's intention toward switching to cloud computing is not just positively affected by switching enablers such as omnipresence and collaboration support, but also it can be negatively affected by switching inhibitors like satisfaction with existing IT system and the amount of use of existing IT. Switching benefits and cost were also recognized to be positively influential for cloud computing adoption as moderating factors.

In a different study Shin (2013) examined the cloud computing acceptance services in government organizations. They extend the core technology acceptance model by including availability, access, security, and reliability. They found that Perceived Availability, Perceived Security, Perceived Reliability and Perceived Access affect Behavioral Intention and consequently Use Behavior of cloud computing through Perceived Usefulness and Perceived Ease of Use. Subjective Norm also was found an antecedent for Behavioral Intention. The study also proposes that governments should give promotion of cloud public services to inform Consumers about it.

And finally Du, Jian, et al. (2013) peruse the user acceptance of SaaS among a Chines e-commerce company, Alibaba. The factors that have been considered in the study were ease of use, security, reliability and responsiveness e-service quality, usefulness, and social influence. And based on their findings Ease of Use, Security, Reliability and Responsiveness constructs have considerable impact on Behavioral Intention through Perceived Usefulness while Subjective Norm is directly affect Behavioral intention.

As it might understood from the evidence there is a significant need in investigating the individual's perception of cloud computing acceptance, drivers and barriers. Especially in developing countries such as Turkey and Iran there are lack of creditable studies. And as the academic studies are always drivers for the industry, to be able to catch this new trend and benefit from it, the current study and other similar studies play a vital role.

The current study is important from the both service provider point of view and consumers as well. The service providers can benefit from the results of this study to gain more information about the service consumer profile and provide better services.

3. RESEARCH MODEL AND METHOLOGY

This part is dedicated to identifying the manner that is used to conduct this study. Firstly, research perspective and scope is identified, then the adopted strategy of the research will be presented. Next, data collection methods and the types of data that was collected the research will be explained. Lastly, the validity and reliability of research will be discussed.

3.1 RESEARCH MODEL

As mentioned the goal of this study is to identify what factors affect the acceptance of cloud computing in Iran and Turkey by using an extension of technology acceptance model. There are two distinct perspectives on adoption of cloud computing, including technology organizational and individual.

The current research's perspective will be an individual's point of view where these individuals are considered to be IT experts because of the low rate of awareness about cloud computing term among common people.

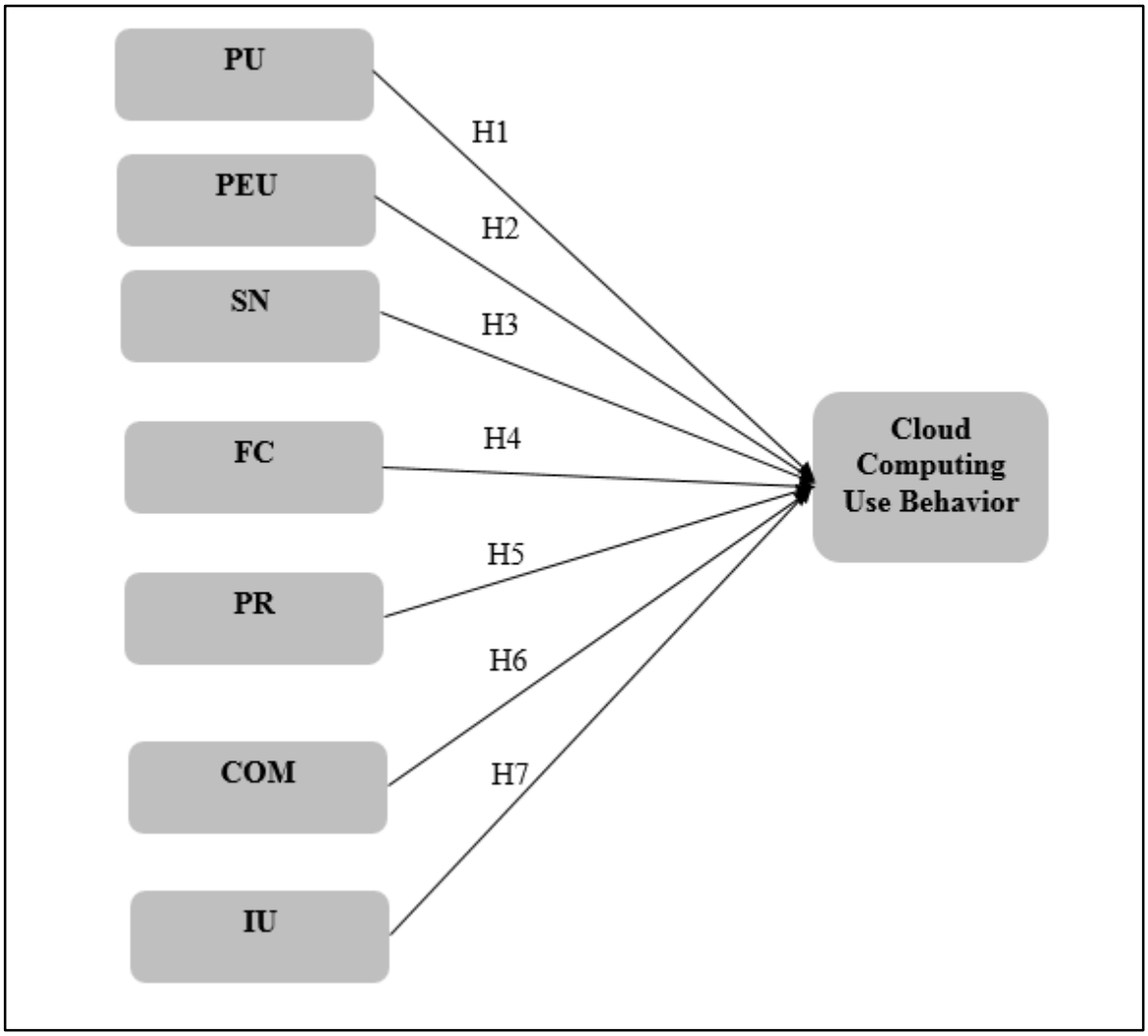
Different studies have been carried in the literature using one of the Theory of reasoned action, Theory of planned behavior and Technology acceptance model frameworks or even an integration of various models to explore factors influencing cloud computing acceptance or adoption.

In this study the technology acceptance model has been chosen to be applied because the purposed society of this study was individuals and TAM is a framework that measures an individual's perception.

The proposed research model includes six factors of Perceived usefulness, perceived ease of use, Perceived Risk, Compatibility, Social influence, Facilitating conditions which are assumed to have influence on consumers to accept cloud computing. The proposed factors

were supported by other studies in terms of technology acceptance. The following figure depicts research model proposed by this study:

Figure3.1: Research Model



Source: Prepared by Parastoo Dashti

3.2 HYPOTHESIS

The proposed hypothesis in current study listed below with the definition of constructs and reasons for adopting by giving evidence from previous studies with similar structures.

Perceived Usefulness

Perceived usefulness refers to the perception of user about how using a technology can bring benefits and improve his or her performance, effectiveness and flexibility in his or her job. Totally it is the evaluation of user about if using a particular technology will improve the final outcomes. The impact of perceive usefulness on intention to use cloud computing was tested and validated in different studies Du et al. (2013), Behrend (2011), Shin (2013). Therefore, following hypothesis was posited:

H1a: Perceived usefulness has a positive effect on acceptance of cloud computing among Iranian users.

H1b: Perceived usefulness has a positive effect on acceptance of cloud computing among Turkish Users.

Perceived Ease of Use

Perceived Ease of Use refers to a user's perception about how much using a particular technology might be easy for him. In this study it will be considered as service consumers believe about how much cloud computing service utilization will be free of mental, technical or infrastructural difficulties. Some studies also have shown that perceived ease of use has a significant effect on consumer acceptance of cloud computing Du et al. (2013), Behrend (2011), Shin (201). Therefore, following hypothesis was posited:

H2a: Perceived ease of use has a positive effect on acceptance of cloud computing among Iranian users.

H2b: Perceived ease of use has a positive effect on acceptance of cloud computing among Turkish users.

Subjective Norm

Social Influence was proposed by Venkatesh et al. (2003) in consistence with Subjective norm construct which was defined in Fishbein and Ajzen (1975) TRA theoretical framework as individual's feeling about the people who are important to him think that he needs to adopt a technology or ether reject. There is also related studies about the effect of subjective norm in behavioral intention to adopt a technology. According to Shin (2013) Subjective norm has a significant effect on user adoption of cloud computing.

People in a society can share their ideas, experiences and feeling about using a particular technology and effect each other's decisions. Especially when criticizes is done by respected people it can play more important role in user's intention.

In this study subjective norm indicates the effect of people on users' perceptions about using cloud computing. Thus the following hypothesis was proposed:

H3a: Subjective norm has a positive effect on acceptance of cloud computing among Iranian users.
H3b: Subjective norm has a positive effect on acceptance of cloud computing among Turkish users.

Facilitating Conditions

Facilitating condition refers to a user's feeling about existence of support to ease the process of adopting a new technology. This construct is so similar to perceived behavioral control in Venkatesh et al. (2003) study.

In this study, facilitating conditions construct indicates user's evaluation about whether all the conditions such as resources, knowledge and support for utilizing cloud computing is provided or not.

H4a: facilitating conditions has a positive effect on acceptance of cloud computing among Iranian users.
H4b: facilitating conditions has a positive effect on acceptance of cloud computing among Turkish.

Perceived Risk

When considering an innovative technology's acceptance both positive and negative factors should be taken under investigation, whereas in technology adoption theories and researches there is a lack of negative factors consideration. Perceived risk construct has been used in the current study because cloud computing technology is strongly internet dependent. Investigating any internet based technology's acceptance the related risk perception can be one of the most influential constructs because of the uncertain and risky nature of the internet.

Risk can be seen as any kind of potential danger that may threat user's resources. One of the initial requirements to adopt a technology can be found a system trustable or less risky. Risk and trust can be seen as two correlated constructs. In other word, the more a system is risky the loss is treatable.

In this manner perceived risk will be a comprehensive construct including all the negative perceptions of user about adopting cloud computing technology. Thus, the trust could be considered as a function of risk involved in a situation and due to this reason risk has been chosen as the driven construct.

Risk can be defined as the consumer's perception of loss in using a particular technology. Pavlov (2008) extends the technology acceptance model with adding risk and trust constructs in the investigation of e-commerce acceptance context. Later in 2003 Featherman and Pavlouv looked in depth to risk construct and added it to technology acceptance model as a driver for perceived usefulness and ease of use. Various facets of risk were defined in their study. According to them, risk has seven different types, namely Performance risk, financial risk, Time risk, Psychological risk, Social risk, Privacy risk, Overall risk. Performance risk is described as the degree to which it is possible a system not perform as it supposed to and consequently not be able to deliver the desired outcomes. Financial risk had been considered as the degree to which performing a behavior will cause monetary loss for users in every manner such as the buying price and also marinating price. With the time risk construct they meant that consumers may lose time when trying to adopt a new system by deciding if they should buy or not and also after buying the new product in the learning phase of the new system by staff and so on. As it is understood from the word itself Psychological risk refers to the risk that the choosing a specific system or its performance will have on the consumer's own mind. Social risk means the potential risk that adopting a new system might have for the user in his social status. Simply The degree to which adopting a new technology might cause the user to have a low social status.

Privacy risk refers to the degree to which using a specific technology might cause loss of user's personal information such and cause privacy issues for adopter. And finally overall risk defined as total degree of perceived risk when considering all facets together.

In the current study perceived risk construct has been considered as one factor, including all the facets of risk that has mentioned earlier by Featherman and Pavlouv (2003). For this aim in the questionnaire design phase, we tried to include all the facets in the risk related questions and cover them under the risk construct completely. Due to this reason the questions related to the risk construct are more than other constructs. Thus, the following hypothesis was posited:

H5a: Perceived Risk has a negative effect on acceptance of cloud computing among Iranian users.
H5b: Perceived Risk has a negative effect on acceptance of cloud computing among Turkish users.

Compatibility

When considering a new system adoption one of the major concerns could be compatibility of the new system and its features with exiting system. The users are more likely to adopt systems with more compatibility rate with their existing system. Especially in firm level acceptance of new system compatibility will gain more importance because adopting an incompatible system can cause material and spiritual loss for the organization. It may cause changes to the whole operational process.

In individual level of acceptance, compatibility plays a significant role. Individuals have access to less financial support comparing to organizations so they will look for the systems that will cause them less change and more compatible with their existing equipment and knowledge.

Compatibility can be described as the degree in which using a specific technology is perceived align with the prior experiences of the user. Karahanna et.al (2006) posited a general description of compatibility that decomposes the compatibility construct into four subsets: compatibility with preferred work style, compatible with existing work practices, compatibility with prior experience, and compatibility with values.
Therefore the following hypothesis is posited:

H6a: compatibility has a positive effect on acceptance of cloud computing among Iranian users.
H6b: compatibility has a positive effect on acceptance of cloud computing among Turkish users.

Intention to Use

Intention to Use is one of the technology acceptance model's inclusive constructs which was posited by Davis (1989). As he points out in the initial model of TAM Intention to Use has a direct effect on users actual system use. Thus the following hypothesis is proposed:

H7a: Intention to Use has a positive effect on acceptance of cloud computing among Iranian users.
H7b: Intention to Use has a positive effect on acceptance of cloud computing among Turkish users.

3.3 RESEARCH DESIGN

Cloud computing can be seen as one of the fastest rising phenomena in the Information Technology field. Thus, in this research, the aim is to gain depth knowledge in the area of cloud computing itself and its adoption in Turkey and Iran as two developing countries with some similarities.

Based on the prior analysis that has been done in literature review part a set of factors which are considered to be most influential constructs in acceptance of cloud computing among Turkish and Iranian users derived.

3.4 RESEARCH INSTRUMENT

To measure the proposed hypothesis the questionnaire method was selected. The relevant questionnaire has been prepared based on previous studies in the technology adoption area, including E-banking acceptance, E-service acceptance, and Wireless Internet adoption and so on.

After preparation of the questionnaire, since the scope of this study was Iranian and Turkish user's acceptance, it has been translated to both Turkish and Persian languages in order to clear all the potential misunderstandings and make the questionnaire as clear as possible for respondents.

The questionnaire is divided into two parts. The first part of the questionnaire involves questions related to respondent's specifications such as their age, sex, education level, and the level of cloud computing usage. The second part contains questions related to hypothesized factors to recognize the diver factors for cloud computing acceptance. In the last question, respondents were asked to name any type of local cloud computing services they might have used.

Except the first part of the questionnaire and the last question remaining questions were evaluated by five-point Likert scale in range of strongly agree to strongly disagree. The full questionnaire can be seen in Appendix A.

3.5 RESEARCH SAMPLE

The questionnaire distributed among Turkish and Iranian users. But since the term "cloud computing" is not well known enough among common people in society, the questionnaires are tried to be distributed among IT specialists or people with computer science major to achieve a more creditable answer.

Due to this aim in turkey the questionnaires distributed in university among IT related majors, students or lecturers in the form of online and paper- based. Because of less maturity that technological innovations have in the context of Iran it was decided to distribute the questionnaires through a website which has been provided by a well-known university (Amir-Kabir university of Technology) with the aim of cloud computing based investigations and other universities.

A total number of 200 Responses were collected which 100 responses were replied by Iranians and 100 responses were related to Turkish people. The Kaiser-Meyer-Olkin measure of sampling Adequacy was checked and the obtained result found significant. The KMO was equal to .79 which is greater than .6 and consequently is significant.

The questionnaire was not considered as one, but all the analyses were tested separately for Iranian and Turkish responses.

4. DATA ANALYSIS

In this section the data that has been gathered through questionnaires was organized and prepared for analysis first the validity of data should be assessed by using reviewers to read the questionnaire and make their comments about it then the reliability of the data should be examined by using Cronbach's alpha technique. Both validity and reliability tests was done on the data belong to each region separately.

The first step in the analysis was cleaning dataset, collected data was checked and cleaned from any error to be able to obtain accurate outcomes.

4.1VALIDITY

The validity of the instruments is the degree to which a research instrument (Survey, interview, questionnaire, etc.) measures performs as it is designed to perform. In other words, validity checks the degree to which the outcomes of the study are actually representing the construct under investigation.

To test the validity of the study, questionnaires were checked and approved by the university supervisor in both regions under investigation which were Turkey and Iran. Both of them agreed on the validity of the questionnaire.

Later a pre-test of the factors was done by giving the questionnaire to two reviewers of each country and asking them to fill it and make their comments about questions. The pre-test results revealed that there are some questions that are not clear to the respondents and can cause misunderstandings for respondents which will affect the answers. Thus the unclear questions were revised and corrected and a second checkup was done by asking the same reviewers to fill the questionnaire again and see if they have any other problem. The reviewers agreed on the validity of instruments.

4.2 RELIABILITY

Instrument reliability is the process to ensure that the instrument which is used for measuring whether experimental variables gives the same results every time we repeat the experiment or not. In other word, it can be seen as the amount of consistency in experiments. There are a variety of approaches to evaluate the internal consistency reliability of the scale, such as inter-item correlations, Cronbach's alpha, and corrected item-total correlations.

The reliability of the instrument was examined in this part separately for both countries under investigation. In order to examine the reliability of the instrument the internal consistency of factors were estimated by using Cronbach's alpha coefficient (α) firstly which is the most commonly used approach to test internal consistency. Further other reliability tests also were included to have a wider interpretation about the instrument.

The reliability of all 8 scales in our questionnaire including PU, PEU, SN, PR, FC, COM, IU, and UB was tested. Acceptable reliability score in Cronbach's alpha coefficient (α) is at least 0.6 between zero and one which means 60 percent consistency (Hair et al. 1998).

Achieved total reliability for Iranian data was 0.60 which can be counted as reliability amount. On the other hand the total reliability for Turkish data was 0.74 which is reliable as well. Cronbach's Alpha Based on Standardized Items calculates alpha under the pretense that the items all have the same variance which in practice it is not usually the case.

In the table Item-Total Statistics also we can see that by removing PR or COM construct the amount of reliability for our model in both regions will be higher. For instance, in Iranian data by removing PR we can reach to 0.62 and by removing COM also we can reach to 0.63 amounts of reliability which is slightly higher than the current amount. Also in Turkish data sample we can reach our reliability to 0.81 by removing PR construct and 0.75 by removing COM. But since the targeted amount of reliability is met in both cases none of the constructs have been removed.

4.3 DESCRIPTIVE STATISTICS

Descriptive statistics of samples of the study is depicted in the table 4.1. The respondent's gender, age, education level, position in IT, usage duration of cloud services in both countries are provided.

Table4.1Respondents Profile

Measure		Frequency		Total Percentage
		Iranian	Turkish	
Gender	Female	42	45	43.5 %
	Male	58	55	56.5 %
Age	Less than 25	32	59	61.5 %
	Between 26 & 35	62	37	80.5 %
	Between 36 & 45	6	4	5 %
	More than 45	0	0	0 %
Education Level	Bachelor's Degree	44	61	52.5 %
	Master's Degree	50	37	43.5 %
	PhD	6	2	4 %
Position	Manager	7	7	7 %
	Developer	22	14	18 %
	IT Specialist	36	20	28 %
	Student	35	59	47 %
Usage Duration	Less than 6 Month	33	38	35.5 %
	Between 6Month & 1Year	16	17	16.5 %
	More than 1Year	51	45	48 %
Total		100	100	100 %

Source: Prepared by Parastoo Dashti

The number of male and female respondents is roughly the same in both countries. In total most of the respondents were male with 56 percentages.

The result shows that Turkish respondents were younger than Iranians. Totally the majority of respondents are young and less than 35 years old. And there is no one older than 45 years old who filled the questionnaire. As there was no age restriction in questionnaire this might happen because of the restriction “Most Have Prior Experience” that was required in order to fill the questionnaire. Since this technology is a new phenomenon, it can be derived that it is not well-known or used among elderly people.

Education level among Iranian respondents was higher than Turkish respondents, but generally speaking, most of the respondents were qualified with bachelor’s degrees.

The position of respondents was asked in the question, considering answers most of the Iranian respondents defined themselves as IT specialist with around 36 percentage. In the other the majority of Turkish respondents were students. In total the respondents are mostly in the student level in IT context.

The Usage Duration of cloud computing services, was asked to respondents to evaluate the maturity of the technology among them. Based on answers gathered from both countries around half of the respondents were using cloud computing services for more than 1 year with 48 percentages.

Descriptive statistics of the variables in both data samples were also checked to evaluate the mean and standard deviation of variables related to the both regions. The table 4.2 shows descriptive statistics of the variables for both countries.

Table4.2: Descriptive Statistics

Variable		Mean	Std. Deviation
PU	Iranian	1.8775	.73297
	Turkish	1.9900	.91627
PEU	Iranian	2.2425	.72165
	Turkish	2.4125	.81910
SN	Iranian	2.4725	.85716
	Turkish	2.3425	.87304
FC	Iranian	2.2100	.69333
	Turkish	2.4700	.81249
PR	Iranian	2.4388	.77127
	Turkish	2.8700	.70245
COM	Iranian	3.1275	.42268
	Turkish	2.8700	49298
IU	Iranian	3.1267	.51635
	Turkish	2.6267	.62186
UB	Iranian	1.7850	.56967
	Turkish	2.0800	.92310

Source: Prepared by Parastoo Dashti

4.4 NATIONALITY EFFECT CONSIDERATION

The independent T - test was applied to evaluate the difference between the means of two independent groups. Here the test was done to consider the difference of means of each

variable for both countries under investigation, Iran and Turkey. With the aim of considering if nationality has statistically significant effect on cloud computing use behavior. Each variable in the study has been compared with its own pair with the other group and the difference of them was measured and finally the significance of each variable was tested to measure the degree of importance of the variable for the users based on their nationality. Table 4.3 shows the detail information about the t-test results.

Table4.3: Nationality effect consideration by T-test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
PU	Equal Variance Assumed	3.378	.068	-.959	198	.339
	Equal Variance Not Assumed			-.959	188.893	.339
PEU	Equal Variance Assumed	2.013	.158	-1.557	198	.121
	Equal Variance Not Assumed			-1.557	194.906	.121
SN	Equal Variance Assumed	.002	.969	1.063	198	.289
	Equal Variance Not Assumed			1.063	197.933	.289
FC	Equal Variance Assumed	1.490	.224	-2.434	198	.016
	Equal Variance Not Assumed			-2.434	193.220	.016
PR	Equal Variance Assumed	.785	.377	-3.774	198	.000
	Equal Variance Not Assumed			-3.774	196.295	.000
COM	Equal Variance Assumed	1.138	.287	3.965	198	.000
	Equal Variance Not Assumed			3.965	193.491	.000
IU	Equal Variance Assumed	.651	.421	6.186	198	.000
	Equal Variance Not Assumed			6.186	191.529	.000

Source: Prepared by Parastoo Dashti

The result reveals that the t value is positive regarding to SN, COM, IU variables which means the amount of means of these variables in Iranian group were significantly greater

than the means of the same variables in Turkish group. We can interpret that Iranian people find these variables more important than Turkish people.

In Levene's test section the assumption that if the variances of two groups are the same, has evaluated. Under this assumption we can see that in all variables are in significant level of .05. So we can interpret that the equality of variance assumption is not violated.

The results shows that there is no significant difference between Perceived Usefulness, Perceived Ease of Use, Subjective Norm in Iran and Turkey.

Based on the results, Facilitating Conditions was significant, t (198) = -2.43, P= 0.01 with slightly higher degree among Turkish respondents as opposed to Iranian. So it can be interpret that Facilitating Conditions is more important for Turkish people (M = 2.47, SD = 0.81) in comparison with Iranians (M = 2.21, SD = 0.69). The effect size also should be checked to measure the magnitude of mean differences so Eta square was calculated. Based on the result the eta squared value was .02 which is small it means that only 2 percent of the variance in the Facilitating condition's score is explained by nationality.

$$\eta^2 = \frac{t^2}{t^2 + (N1 + N2 - 2)} = 0.02$$

Perceived risk was also significant, t (198) = -3.77, P= 0.000 with higher degree among Turkish respondents which means Perceived risk is more important for Turkish people (M = 2.83, SD = 0.70) in comparison with Iranians (M = 2.43, SD = 0.77). The effect size also was checked for Perceived risk as well. Eta squared indicated that only 6 percent of the variance in the Perceived risk's value can be explained by nationality.

Compatibility measure was also found significant with t (198) = -3.96, P= 0.000 with higher degree among Turkish respondents which means Compatibility is more important for Iranian people (M = 3.12, SD = 0.42) in comparison with Turkish (M = 2.87, SD = 0.49). Eta square

revealed that 7 percent of the variance in the Compatibility's value can be explained by nationality.

Intention to use also found statistically significant with t (198) = 6.18, P= 0.000 with higher degree among Iranians (M = 3.12, SD = 0.51) in comparison with Turkish (M = 2.6, SD = 0.62). Eta square revealed that 16 percent of the variance in the Compatibility's value can be explained by nationality.

4.5 CORELATION TEST

In order to find the correlation among variables in the current study, the Pearson product moment correlation coefficient was applied. The significance test for r estimates whether there is any linear relationship between two variables in the population. The score of Pearson Correlation Coefficient varies from -1 to +1. A positive coefficient depicts that the two construct are actually in the same direction and also a negative coefficient will mean they are in the opposite directions with each other. Green and Salkind 2004).

First the Iranian sample data was considered .Based on the results that has been gained, 9 out of 28 correlation observed to have statistically significant value of correlation.

Perceived Usefulness posed a significant relation with Perceived Ease of Use, r (98) = .38, p= .000 < .01, and Subjective Norm with .45 value of correlation. As mentioned earlier Use Behavior of Cloud Computing also shows a significant level of correlation with Perceived Usefulness. This is also interesting that there is no relation between Perceived Usefulness and variables like Facilitating Conditions, Perceived Risk, Compatibility and Intention to Use of cloud computing in Iranian data correlation matrix.

Perceived Ease of Use's correlation was found statistically significant with Subjective Norm with .40 value of correlation and Use Behavior with .32 value of correlation. And the correlation of Perceived Ease of Use and the other variables was not in significant level.

Similarly Facilitating Conditions seems to have significant correlation with Perceived Risk construct with .240 value of correlation and 0.16 level of significance. Perceived Risk has significant correlation with Intention to Use Cloud Computing construct with .201 value of correlation and 0.04 level of significance. The tables 4.4 provides information about the correlation between variables in Iran.

Table4.4: Correlation test on Iranian data

		PU	PEU	SN	FC	PR	COM	IU	UB
PU	Correlation	1							
	Sig. (2-tailed)								
PEU	Correlation	.378**	1						
	Sig. (2-tailed)	.000							
SN	Correlation	.451**	.396**	1					
	Sig. (2-tailed)	.000	.000						
FC	Correlation	.196	.296**	.295**	1				
	Sig. (2-tailed)	.050	.003	.003					
PR	Correlation	-.140	-.022	.090	.240*	1			
	Sig. (2-tailed)	.166	.829	.375	.016				
COM	Correlation	-.020	-.028	-.004	-.110	.066	1		
	Sig. (2-tailed)	.840	.783	.967	.278	.515			
IU	Correlation	-.143	-.113	.040	.068	.201*	-.129	1	
	Sig. (2-tailed)	.155	.265	.691	.499	.044	.202		
UB	Correlation	.444**	.322**	.509**	.502**	.114	-.050	-.007	1
	Sig. (2-tailed)	.000	.001	.000	.000	.258	.620	.948	

Source: Prepared by Parastoo Dashti

The inter correlation between variables was also examined separately for Turkish data sample. The table 4.5 illustrates the details of relationships of variables under investigation with each other. As it can be seen 18 out of 28 correlations were found statistically significant.

Table4.5: Correlation test on Turkish data

		PU	PEU	SN	FC	PR	COM	IU	UB
PU	Correlation	1							
	Sig. (2-tailed)								
PEU	Correlation	.701**	1						
	Sig. (2-tailed)	.000							
SN	Correlation	.475**	.488**	1					
	Sig. (2-tailed)	.000	.000						
FC	Correlation	.374**	.505**	.407**	1				
	Sig. (2-tailed)	.000	.000	.000					
PR	Correlation	-.097	-.199*	-.289**	-.319**	1			
	Sig. (2-tailed)	.336	.047	.003	.001				
COM	Correlation	.155	.167	.160	.215*	-.097	1		
	Sig. (2-tailed)	.124	.097	.111	.032	.336			
IU	Correlation	.435**	.347**	.387**	.364**	-.137	.087	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.174	.388		
UB	Correlation	.645**	.468**	.447**	.370**	-.100	.043	.616**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.323	.675	.000	

Source: Prepared by Parastoo Dashti

By looking at the Use Behavior of cloud computing as the dependent construct in this study it is seen that this variable has statistically significant correlation with perceived Usefulness (.65), Perceived Ease of Use (.47), Subjective Norm (.45), Facilitating Conditions (.37) and Intention to Use (.62) in Turkish data sample . Perceived Risk and Compatibility were found insignificant.

Perceived Usefulness poses significant correlation with Perceived Ease of Use with .70 value. Subjective Norm had also statistically significant correlation with Perceived Usefulness with .47 value. Facilitating Conditions and Intention to use had significant correlation with Perceived Usefulness with value of .37 and 0.44. In contrast there was no relationship between Perceived Usefulness and Perceived ease of use and Compatibility.

Considering Perceived Ease of Use it is notable that except compatibility it was found to have significant correlation with Subjective Norm (.49), Facilitating Conditions (.51) and Intention to Use (.35). Perceived Risk has negative correlation with Perceived Ease of Use (-.199) indicating Inverse relationship these two variable have with each other. Simply the more Perceived Risk is high in cloud computing usage the less it is found to be easy to use by Turkish respondents.

Subjective Norm had significant relation with Facilitating Conditions (.41) and Intention to Use (.39). But it's correlation with Perceived Risk and Compatibility wasn't significant.

Facilitating Conditions construct was found in significant relation with Intention to use (.36), positive significant relation with Compatibility (.21) and negative correlation with Perceived Risk (-.31).

Surprisingly it seems in Turkish data sample there is no significant relation among Perceived Risk and Compatibility, Intention to Use and Use Behavior. Also Compatibility

has insignificant correlation with Intention to Use cloud computing and Use Behavior of cloud computing.

Generally the highest correlation observed between Perceived Usefulness and Perceived Ease of Use. But if we consider cloud computing Use Behavior as the phenomena under investigation, Perceived Usefulness will be the most correlated variable with it among all variables.

Comparing two countries results it can be seen that the number of variables that have been reached to significant level of correlation in Turkish sample was greater that Iranian sample. Also it can be derived that the most important driver for Turkish Users in Use of Cloud Computing was Perceived Usefulness but in the other hand Subjective Norm was found as the most important driver toward Use of Cloud Computing among Iranian users.

5. DISCUSSION AND CONCLUSION

5.1 DISCUSSION

In the previous section the correlation between factors was examined by applying Pearson Product Coefficient Correlation. In this part the proposed hypothesis by current research will be tested to find out if the outcomes of the study are either accepted or rejected.

This research sought to examine TAM in Cloud Computing Adoption in the two different regions Turkey and Iran. The calculated Cronbach's alpha correlations were above 0.6 for both data samples under investigation as presented in the corresponding columns of the Table in reliability test part, which shows the magnitude of reliability of the measures in the study was satisfactory. The correlation among the variables under investigation in the proposed model was analyzed by the Pearson Product Coefficient Correlation method with the help of SPSS software.

The proposed model has used the original variables of TAM and Compatibility and Perceived Risk as new experimental factors. The model had eight factors, namely Cloud Risks (CR), Perceived Usefulness (PU), Perceived Ease of Use (PEU), Subjective Norm (SN), and Intention to Use (IU), Facilitating Conditions (FC), Compatibility (COM) and Perceived Risk (PR). According to the model, PU, PEU, SN and FC had an effect on Use Behavior of Cloud Computing while PR and COM were not the direct predictors of actual use of Cloud Computing. The results of the analysis for each variable will be discussed further, but the result of hypothesis test for each region is listed below.

H1a: Perceived Usefulness is in positive relation with Use Behavior of cloud computing hypothesis was proved in Iranian sample.
H1b: Perceived Usefulness is in positive relation with Use Behavior of cloud computing hypothesis was proved in Turkish sample.

H2a: Perceived Ease of Use is in the positive relation with Use Behavior of cloud computing hypothesis was proved by Iranian sample.
H2b: Perceived Ease of Use is in the positive relation with Use Behavior of cloud computing hypothesis was proved by Turkish sample.

H3a: Subjective Norm is in the positive relation with Use Behavior of cloud computing hypothesis was proven by Iranian sample.
H3b: Subjective Norm is in the positive relation with Use Behavior of cloud computing hypothesis was proven by Turkish sample.

H4a: Facilitating Conditions is in the positive relation with Use Behavior of cloud computing hypothesis was proven by Iranian sample.
H4b: Facilitating Conditions is in the positive relation with Use Behavior of cloud computing hypothesis was proven by Turkish sample.

H5a: Perceived Risk is in the negative relation with Use Behavior of cloud computing hypothesis was rejected by Iranian sample.
H5b: Perceived Risk is in the negative relation with Use Behavior of cloud computing hypothesis was rejected by Turkish sample.

H6a: Compatibility is in the positive relation with Use Behavior of cloud computing hypothesis was rejected by Iranian sample.
H6b: Compatibility is in the positive relation with Use Behavior of cloud computing hypothesis was rejected by Turkish sample.

H7a: Intention to Use is in the positive relation with Use Behavior of cloud computing hypothesis was rejected by Iranian data sample.
H7b: Intention to Use is in the positive relation with Use Behavior of cloud computing hypothesis was accepted by Turkish sample.

Perceived usefulness

For the first hypothesis regarding Perceived Usefulness had positive and significant correlation 0.44, at 0.000 significance level in Iran. R squared was measured as.19 which means that 19 percent of the variance in cloud computing acceptance can be accounted by its Perceived Usefulness. In Turley in the other hand, the correlation was equal to 0.65, P value was equal to 0.000. The R squared was found to be.42 meaning 42 percent of the variance in cloud computing acceptance can be defined by Perceived Usefulness. Consequently the proposed hypothesis was accepted. By comparing two distinct regions we can determine, Turkish respondents found Perceived Usefulness to be more important for cloud computing acceptance and also we can say the higher perceived usefulness is the higher acceptance of cloud computing will be. So, Perceived Usefulness of cloud computing services, was found to be an important driver in both regions, indicating in order to increase acceptance of cloud computing in both countries, it is essential to inform customers about the potential advantages of using cloud computing services. The earlier researchers also found Perceived Usefulness as an important factor toward using cloud computing services and suggested to the providers to determine customers' needs in depth and develop related services based on their needs .Du, et al.(2013)

Perceived ease of use

Examining the second hypothesis, it was found that Perceived Ease of Use had positive and significant correlation 0.32, at 0.001 significance level in Iran. R squared was measured as.10 indicating that 10 percent of the variance in cloud computing acceptance can be explained with Perceived Ease of Use of cloud computing. And in Turkey, the correlation was equal to 0.47, P value was equal to 0.000. The R squared was found to be .22 meaning 22 percent of the variance in cloud computing acceptance can be explained by Perceived Usefulness. So the proposed second hypothesis were also accepted in both countries. Looking at the result of both regions it can be understood that Turkish respondents found Perceived Ease of Use to be more essential for the use of cloud computing and also the

acceptance of cloud computing and Perceived Ease of Use of Cloud computing are in the same direction. According to the results in order to increase acceptance of cloud computing in both countries, it is essential to keep the offered services as simple as possible, give the services at different levels depending the customer's properties. Previously the effect of Perceived Ease of Use of cloud computing was tested in (Opitz et al. 2012) study they found out that Perceived Ease of Use has an indirect effect on Actual Use of cloud computing through Intention to Use.

Subjective norm

The Third hypothesis regarding Subjective Norm and its relationship with cloud computing Use Behavior it was found that Subjective Norm had positive and significant correlation 0.51, at 0.000 significance level in Iran. R squared was .26 which means 26 percent of the variance in cloud computing acceptance is explained by Subjective Norm.

Similarly in Turkey, the correlation was 0.45, P value was equal to 0.000 and the R squared was .20. Based on this result the proposed hypothesis was accepted in both countries. It is also notable that Subjective Norm has gained more attention among Iranian respondents. Subjective Norm and cloud computing Use Behavior are in the same direction as it can be understood by the correlation sign which is positive.

This result shows that Iranian people are more impressed by people in their community's opinion about cloud computing so to be able to increase acceptance of cloud computing in both countries and specially in Iran service providers should try to inform people and increase their awareness about cloud computing, it's features through different channels such as different kind of advertisements or offers.

Aligned with current study Opitz et al. (2012) found Subjective Norm to be an important driver for cloud computing usage through contributing Perceived Usefulness and relatively Intention to Use and finally Use Behavior.

Facilitating conditions:

Facilitating Condition was considered as forth a hypothesis, its relationship with cloud computing Use Behavior was found to be positive and significant with a correlation of 0.50, at 0.000 significance level with R squared of .25 indicating 25 percent of the variance in cloud computing acceptance can be explained by Facilitating Conditions. In Turkey, the correlation was 0.37, P value of 0.000 and the R squared was .14. The result shows that the proposed hypothesis were accepted in both countries. Facilitating Condition was considered most important by Iranian respondents.

This result shows that Iranian people are more impressed by people in their community's opinion about cloud computing so to be able to increase acceptance of cloud computing in both countries and especially in Iran service providers should try to inform people and bring awareness about cloud computing and its features through different channels such as different kind of advertisements or offers.

Aligned with current study (Dhulla & Mathur, 2014) found that Facilitating Conditions had direct effect on Behavioral Intention toward using cloud computing and relatively effect on actual Use Behavior.

Perceived risk

Perceived Risk as fifth hypothesis, had an insignificant relationship with cloud computing Use Behavior in both countries. The correlation of Iranian data was 0.114 and p value was 0.258. Similarly, in Turkish sample data, the correlation was 0.10, P value of 0.323. According to this result the proposed hypothesis were accepted in both countries. This insignificance might be because of considering all the facets of risk as one single construct. This result was opposed to some of the other studies which accepted Perceived Risk as a negative antecedent for adopting cloud computing like the study was carried out by (W.-W. Wu et al., 2011). They have supported their idea by conducting a case study.

Compatibility

Compatibility as sixth hypothesis was examined and found to have insignificant relationship with cloud computing Use Behavior in both regions. The correlation of 0.05 and relatively p value was 0.620 in Iran. Likewise, in Turkey the correlation was 0.04 and P value was 0.000. The result shows that the proposed hypothesis was rejected in both countries. Showing that Compatibility is not a concern for Turkish and Iranian users. Aligned with current study compatibility were found insignificant discriminant for cloud computing usage. It was guessed that this insignificance of Compatibility construct might be because of immaturity of the technology. (Low et al., 2011)

Intention to Use

And finally the seventh hypothesis Intention to Use of cloud computing had positive and significant correlation with Use Behavior in Turkish sample data with correlation of 0.62, at 0.000 significance level with R squared of .38 which means 38 percent of the variance in cloud computing acceptance can be explained by Intention to Use construct. But considering Iranian data it was found that the correlation of Intention to Use with Use Behavior was insignificant. The correlation was 0.007, P value of 0.948 .Based on obtaining results, the proposed hypothesis were accepted in Turkey but not in Iran. It means that Turkish people have positive intentions toward using cloud computing as opposed to Iranians the reason can be related to unawareness about cloud computing and its advantages or lack of reliable services. So creating intention to use among Iranian customers will be the first point for service providers in Iran. It was proven earlier that even if users have strong intention toward using cloud computing this intention does not mean that they will actually use cloud computing. (Shin, 2013)

Considering the results of hypothesis tests simply it is notable that the original factors of Technology Acceptance Model Perceived Usefulness, Perceived Ease of Use, Subjective Norm and Facilitating Conditions fit totally in the acceptance model of cloud computing for both

regions under investigation while the experimental factors of Perceived Risk and Compatibility could not find significant contribution to increase or decrease the usage of cloud computing services.

5.2 CONCLUSION

Nowadays, IT sector is one of the most powerful industries in the world and due to this reason gains more attention day by day. Iran and Turkey are not exempt from this rule. There are some studies which investigated in the cloud computing and related services in Iran but there is no multicultural research regarding to cloud computing in Iran in compression with other countries.

The current research contributes to the body of knowledge about cloud computing in general to help decision makers and service providers to understand the potential customer's profile more in depth and consequently serve better services.

The main goal of the current research is to finding the most influential factors on the cloud computing acceptance in two different countries as Iran and Turkey. For this aim Technology acceptance model (TAM) adopted to develop the relative research model. The seven factors were tested, including perceived usefulness, Perceived ease of use, Perceived Risk, compatibility, Subjective norm, Facilitating conditions and behavioral intention.

The data were gathered in both countries under investigation and prepared to do further statistical tests on them. Various tests have been carried out on the data to gain an objective view of the current position of cloud computing usage and give suggestions to service providers and decision makers for the future of this technology in both regions.

The reliability and validity of the data as measured and qualified first. The adequacy of sample size was confirmed by applying Kaiser-Meyer-Olkin measure of sampling Adequacy. The result was .79 which is significant.

Further the Independent t-test was carried out to check the difference of means of variables in both countries. The results reveals that there is no significant difference between Perceived Usefulness, Perceived Ease of Use , Facilitating conditions, Perceived Risk, Compatibility and Intention to use in Iran and Turkey.

And finally the correlation among variables was tested by applying the Pearson product moment correlation technique. In Iranian sample data totally 9 out of 28 correlation found to have statistically significant value of the correlation.

Use Behavior showed statistically significant correlation with Perceived Usefulness, Perceived Ease of Use, Subjective Norm and Facilitating Conditions. The most powerful positive correlation was found between Subjective Norm ($r(98) = .51$, $p = .000$) and Cloud Computing Use Behavior. The correlation value between Use Behavior of cloud computing and Perceived Risk, Compatibility and Intention to use was not significant in the Iranian data sample.

The correlation between variables in the Turkish data sample was also examined separately. Totally18 out of 28 correlations were found statistically significant which was more than Iranian sample.

Use Behavior of cloud computing had statistically significant correlation with perceived Usefulness, Perceived Ease of Use, Subjective Norm, Facilitating Conditions and Intention to Use .Perceived Risk and Compatibility were found insignificant.

The highest correlation observed between Perceived Usefulness and Perceived Ease of Use in total correlations but just considering cloud computing Use Behavior we can say that Perceived Usefulness will be the most correlated variable with it.

And lastly the seven hypotheses that were proposed by this study was tested distinctly for both countries. The effect of perceived usefulness, Perceived ease of use, Subjective Norm and Facilitating conditions on Use Behavior of cloud computing in both countries were supported by the results. Perceived Risk and Compatibility constructs were removed due to failing in gaining significant results.

The results indicate that Perceived Usefulness with R squared value of 42 was the most impressive driver for Turkish Respondents. Intention to Use was also an important construct toward acceptance of cloud computing among them for the 38 percent of variance in the use of cloud computing can be defined by user's intention about using cloud computing services. The remaining three variables of Perceived Ease of Use, Subjective Normand Facilitating Conditions were also found to have a significant effect on Use Behavior of cloud computing in Turkish respondent's opinion, but the effect of them estimated to be less than Perceived Usefulness and Intention to Use.

Similarly hypothesis about the effect of Perceived Usefulness, Perceived Ease of Use, Subjective Norm and Facilitating Conditions were supported in the Iranian data sample as well. Remaining factors of Perceived Risk, Compatibility and Intention to Use were failed in gaining a significant level of statistical evidence. Among the all factors Subjective Norm with .26 values of R squared showed that has the highest effect on Use Behavior of cloud computing for Iranian users.

In order to increase customer adoption of cloud computing, service providers should focus on the influential factors of adopting cloud computing, the current study can help them to have a better understanding about the users and their point of view in Turkey and Iran specially.

Considering the significant role of Subjective Norm in both countries, advertising will help to increase awareness of society about cloud computing and relative usage of cloud computing services.

Providing trial or free versions of services will also enhance people's first interaction with the cloud computing. This action will help people get more familiar with the advantages of using cloud computing and will increase the magnitude of Perceived Usefulness and Perceived Ease of Use.

Also removing the barriers can promote the use of cloud computing. For example, one of the most important barriers against cloud computing adoption can be insignificant and safe internet connectivity.

In the further researches different factors also can be taken under investigation to obtain a better understanding about influential factors in cloud computing adoption. Also a different group of people from distinct level of position or education can be examined. The same research can be applied to different countries to increase credibility of the knowledge that has been gained by the current research.

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Appendix A

Factors	Questions	Resources
Perceive usefulness (PU)	1) I expect additional benefits (Flexibility, Work from anywhere, Automatic software updates, and increased collaboration) by using cloud computing services. 2) Using cloud-computing services improves my effectiveness in my job. 3) Using cloud-computing services enhances my performance in my job. 4) I expect higher flexibility in IT by using cloud-computing services.	Davis 1989
Perceived ease of use (PEOU)	1) Using cloud-computing services would not lead to technical difficulties. 2) Cloud computing services integrate quite easily in my IT infrastructure. 3) Using cloud-computing services does not require a lot of mental effort. 4) I find the cloud computing services to be easy to use.	Davis 1989
Perceived risk (PR)	1) Cloud computing services may not perform well because of lack of adequate bandwidth. 2) Internet hackers might take control of my data if I used cloud computing services. 3) I worry that the financial risk of using cloud computing services will be high. 4) The potential to lose control of data	Pavlouv 2008

	and the related privacy issues may lead to a loss of status. 5) I would not feel secure sending sensitive information using cloud-computing services. 6) The Security systems built into the cloud computing services are not strong enough to protect my data. 7) I would not feel secure about the ability to retrieve data backups. 8) If I had begun to use clouds computing services there is high chance that I will lose time due to switch to a different environment.	
Compatibility	1) Cloud computing services enable me to work in the way I prefer. 2) To use cloud-computing services I don't have to change anything I currently do. 3) Using cloud-computing services is different from other experiences for me. 4) Using cloud computing services is not appropriate for a person with my values regarding the role of computers	Karahanna (2006)
Subjective norm	1) People who influence my behavior think that I should use cloud-computing services. 2) Experts who are important to me think that I should use cloud-computing services. 3) People who are important for my career think that I should use cloud-computing services.	Venkatesh, &Davis(2000).

	4) I am expected to use cloud-computing services.	
Facilitating conditions	1) I have the knowledge using cloud-computing services. 2) I have the resources necessary to use cloud-computing services. 3) Given the resources, opportunities and knowledge it takes to use cloud-computing services, it would be easy for me to use it. 4) A specific person (or group) is available for assistance with system difficulties.	Venkatesh, &Davis(2000).
Intention to use	1) I will say positive things about cloud computing services to other people. 2) I will recommend cloud-computing services to someone who seeks my advice. 3) I will use cloud-computing services only when my superior asks me to.	Davis 1989
Use behavior	1) I think positively about using the cloud computing services. 2) Using the cloud computing services has been a pleasant experience. 3) Using cloud computing services is (would be) a good idea. 4) I like (would like) using cloud computing services.	Davis 1989