CLOUD COMPUTING AND ONLINE SERVICES

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Abstract
According to increasing development of technologies such as Information Technology (IT) and using World Wide Web to improve living situation, communications and business transactions, in the past years, and a clear perspective which is available to this trend in future, there felt needs of online services and powerful servers, to have higher speed in services delivery. Therefore, companies such as Google, Microsoft, and Apple stepped up to meet these needs, and as a result, to provide online services, they have designed a model that is called "Cloud Computing". What this paper has tried to deals with is the impact of this model- which has been configured online on the basis of user demand to have easy access- on E-Commerce. This paper has written through analytical overview and according to researches which have been performed about this model. According to this fact that E-commerce requires speed to service delivery, elimination of intermediaries, and cost reduction, cloud computing has had a great achievement in this field. Performed studies in this aspect have demonstrated that the advantages of cloud computing have had positive and comprehensive impact on E-commerce. Cloud computing, based on designed models, has reduced costs, enhanced the speed of service delivery, and, eliminated intermediaries.
Keywords: Cloud Computing; E-Commerce; Information Technology

1. Introduction

Nowadays, increasing development of IT technology, and its impact on human lives and organizations, has created a new chapter in relations between individuals; furthermore, the increase of internet effectiveness and expansion of products by modern and electronic technologies, has established a new paradigm in modern societies. Therefore organizations has tried, through provide online and electronic services, to increase the speed of service delivery (access to client, as well as, client access to services and products) in comparison to the past traditional situations (providing product in physical space), and this resulted in reducing costs to consumers and product or service producers.

In this regard, development of using Personal Computers, Cell Phone, Tablets, and other new technologies are important. Other effective factors are Internet and data clouds, which in fact are servers of online service provider.

Cloud computing is a model to provide easy access, through network -based on user demand- to a set of customizable and configurable computing resources (such as networks, servers, storage space, applications, and services) so that this access, by the minimum needs to resources

management or need to direct involvement of service providers, will be provided and released quickly (Akbari; Tavakoli; Sargolzaee; Javan, 2012).

The emergence of the basic concepts of cloud computing has dated back to 1960s, when "John McCarthy" suggests that “it is possible computation being organized as one of utilities”. " Park Hill, Douglas ", in a book entitled " The Challenge of the Computer Utility”, in 1966, approximately, has investigated all today's features of cloud computing (elastic provision, providing as a utility, being online, and illusion of access to an unlimited supply) along with comparing power industry, and governmental, associative, private and public forms of consumption. The Word of cloud, indeed, has derived from telephone industry, such that, telecommunications companies, which until 1990s, just provided dedicated point-to-point lines, had started to develop virtual private network, with similar quality and less prices. The symbol of cloud was used to display the frontier point between sections that respectively are in the area of users and supplier responsibility. Cloud computing will develop the concept of cloud, so that will include servers in addition to network infrastructure.

The Amazon site, by modernizing its data center, has played an important role in developing cloud computing. After bubble.com, they found that, by converting their data center – which similar to the most computer networks, only 10percent of their capacity have been used and the rest of capacity have been allocated to short term of peak consumption– to cloud architecture, they can improve their internal efficiency. Amazon, since 2006, has allowed accessibility to its systems through Amazon Web Services, based on utility computing. In 2007, Google and IBM, along with several universities have started a great research project on cloud computing (Bagheri, 2011).

There are different formal definitions about cloud computing. National Institute of Standards and Technology defines cloud computing as follows "... a model to facilitate access request to network, in order to share a set of computing resources, which have capability of configuring (such as , networks, servers, storage systems, and services) that are available quickly, and through the least managerial operations and interaction with service provider. (Beheshti; Sarvi, 2012)

In fact, the vast amount of information, growing costs, and the low speed of using software in personal and organizational computer systems has resulted in outstanding this need that powerful servers can implement software, and services, as an interface between users and service provider of organization (such as banks, power companies, and individuals to pay the bills).

In fact the term of "cloud" implies all kinds of distributed computing, in internet, which containing thousands, or even hundreds of thousands or millions computers or servers. Instead of buying high efficiency hardware, or developing different characteristics of this software, using any device connected Internet to the "cloud", and processing and storage data in "cloud", by applying software and information technology services, will be provided to users (Chen Jankay and Qian Shao, 2011).

Recently, community and service provider organizations, on the one hand, have focused on cloud computing, and they found that, "Cloud computing has emerged from an important technology that is result of paying attention to both sociometry and service industry (Min woo, 2010).

On the other hand, E-Commerce that are looking for supra market to provide services easily and in low cost to customers is depend on electronic technology, therefore, proper context in databases,

Internet speed, the volume of information that can transferred over the network will lead to increase of accepting e-services and Internet by customer, and will have a positive specific impact on the trend of providing service ; to do this, special needs to clouds is felt from organization to distribution network and providing service to customers in e-commerce. This paper has tried to investigate the impact of cloud computing on electronic commerce through analytical method.

2. Research Literature

It is a fact that the topic of cloud computing is a new issue, as well as, in this paper, what is important, is its impact on e-commerce, and there is no particular research in Iran on this topic. However, in a research that has been presented by Mohammad Taghi Beheshti" and "Moein Sarvi" in 2012, in the First National Workshop of Cloud Computing, entitled "Cloud Computing: Structure, Benefits, and Challenges", there have useful content, which some of them briefly will present in this paper (in aspect of concept are related to the topic of paper).

The layers should be identified to better understand of cloud computing service, i.e. software as a service, platform as a service, and infrastructure as a service.

1. **Software as a Service:**
   This application in the cloud, make possible eliminating the needs of installing software on the user's system; the main characteristic of this program is accessing based on network-based in order to centralize and long distance management. The cost of these programs will calculate based on the number of software, and the time of consuming. Software as a service, undoubtedly, is the best way of utilizing advanced technology to small and medium-sized organizations, in order to cost saving. The providers of this service are companies such as Google and Salesforce.com.
2. **Platform as a Service**
   Service platforms or platform as a service is a provider of a context for implementing necessary software in fact is supporter of software complete life cycle to user. Middleware is development tools of applications and data base of services which will be provided by platform as a service; Google App Engine is a sample of platform as a service.

3. **Infrastructure as a Service**
   The services of Infrastructure as a service supports server necessary infrastructure. Infrastructure as a Service has collected memory, input - output instruments, storage and processing systems, at a place that is called Storage Virtual Resources 26, and has provided the storage Resources and virtualization service to entire the organization. In fact, users no longer need buying servers, data centers, and network sources, that this one will reduce the cost greatly.

According to variety of triple models cloud models, e-commerce needs clouds to provide service in all three cases. In fact, in the case of software as a service, organizations that provide software products, instead of selling less products with high prices to consumers, can provide them in a limited time, with low costs to users, and online. For example, to edit an image, installing a software is necessary on a personal computer system which in addition to has cost will takes a considerable amount of computer space, so in this case, the user can use cloud online photo editing services, with lower cost, more faster, and without losing a considerable amount of their computers space. Currently there are five types of cloud computing implementation: Public Cloud, Private Cloud, Hybrid Cloud, Group Cloud, and Virtual Private Cloud

1. **Public Cloud:** it allows users to access the user interfaces, through internet browser. Users, in cases such as power bill, will pay cost based on the time of consuming. This capability will reduce it operational costs.
2. **Private Cloud:** the operation related to a private cloud will perform within organization data center. Its advantage is known as management in maintenance, security, better update, and more control of development and application. Resources and programs are managed by the organization. In this type of cloud, security has been improved, because only the members of organization allowed using cloud services.
3. **Group Cloud:** when several companies share their resources in cloud computing, resulting cloud is group cloud; the advantage of this method is reducing costs due to increasing scale.
4. **Hybrid Cloud:** it is a combination of public, private and group clouds. In this model, the private cloud is connected to one or more external cloud services. Organizations will perform main activities, which lead to competitive advantage to them by private cloud, while other activities will complete by other clouds (public or group clouds).
5. **Virtual Private Cloud:** This type of cloud, the first time, has been introduced by Amazon. Virtual private cloud will provide an invisible and safe bridge between organization and provided public cloud, by Amazon, and indeed, it is a combination of public and private cloud, because it uses the public computing capacity, which Amazon has provided them, and it is private, because, firstly, by using Virtual Private Network connection will be secured and, secondly, Amazon will provide a series of distinct sources to organization without receiving any cost.

What already has introduced are Concepts, cloud models and a variety of clouds implementation. Applying cloud computing contains some advantages, which are interesting to organizations and users; some of them are:

- *Easy management:* the cost of maintenance, and infrastructure, including software and hardware has been simplified, and as a result organizational IT will get less into trouble, as well as at the user level, everything that is needed is a browser and an Internet connection.

- *Cost reduction:* The most important advantage for the small and medium enterprises is cost reduction because of taking advantage of economy of scale. Cloud computing inhibit expending money on expensive computational systems and specialized manpower. Its means to user is that they should pay for every hour of using service. Commercial cloud, has a great strength, , one of the most important factors which is discussed on cloud computing, regardless of clients' demands and attitude, is the price. Salesmen, by using great servers and managing several virtual servers, which have the ability of self-encapsulating, can achieve to a great cost saving (Rajesh Vellate2011).
- *Creating new opportunities:* cloud computing made possible the use of plans that were previously infeasible, plans such as interactive mobile applications, which were sensitive to the location or the specific context (such as climate data).
- *Uninterrupted service:* cloud computing should always be available. Interruption in providing services, after security, is the main challenge of this industry.
- *Disaster management:* In the case of disasters occurring in an off-site location, cloud services, makes easy the possibility of creating and restoring backup copies.
- *Green computing:* deadly electrical fluctuations due to high consumption and Waste of Energy are two main disadvantages of modern computing systems. These disadvantages can be reduced by using cloud computing.
- *Centralized management:* Cloud services, which take advantage of supporting the in level of operating system, will increase reliability and security of system because of using centralized management, through improving compatibility between applications, as well as their quick updating.

After paying attention to meaning and the concept of cloud computing, explanation of the meaning and the concept of electronic commerce is necessary too; Trade is commercial transactions in which the seller to make a profit, sells a commodity to the buyer.

In electronic commerce, buying and selling goods perform over the Internet, particularly World Wide Web; such type of trade as one of the most important and the value increasing usage of Information and Communications Technology (ICT) have played special role moves of different countries toward network economy. (Khani Jazani, 2007)

In other definition, the European Commission, in 1977, has defined e-commerce as follows:

"E-commerce is based on electronic processing and transmission of data, including text, sound and image". E-commerce include a variety of activities such as electronic transaction of goods and services, instant delivery of digital content, electronic funds transfer, electronic stock exchange, electronic bill of lading, commercial design, collaborative design and engineering , sourcing, Government procurement, direct marketing, and after sales service (Khani Jazani, 2007).

Undoubtedly, creating World Wide Web and entering firms to supra market has increased Commercial exchange; nowadays, willingness to more sales and more profits, nowadays has made a large number of transactions online, and on the other hand the ease of access and the speed of supplying goods and services has encouraged customers to electronics purchase.

"Oliver " and "C Shell", through studying 57 countries found that the impact of ICT, from 1974 to 2000, not only has not been less than the impact of electricity on economic growth, but also it has been more; their study demonstrated that the contribution of ICT from Gross Domestic Product (GDP) growth per capita, since 1974 to 1990, has increased from 0.7 percent to 1.9 percent in 1996 to 2000 (Torabi; Mohammad Zade Asl, 2009). Several studies have emphasized that the amount of transactions has increased, after emergence of e-commerce. Nowadays, on the basis of the rapid growth of Internet in various industries, and doing purchases and supplies of organizations through this medium, electronic markets have attracted great attention, so that "Forrester Research" predicts to digital markets will allocate themselves about 53percent of total world commercial operations (Mokhtari, 2009).

Evaluation of electronic commerce indicator, which has performed for 40 countries, in 2008, demonstrated that more than 86 percent of worldwide users and nearly 70 percent of worldwide revenue are allocated to e-commerce. According to this indicator, the amount of electronic transactions, in 2008, has been more than 781 million euro (U.S. $ 2,753 million). This indicator obtain based on the latest data from 30 key variables, which are 35 sets of data, include demographic, business environment, technological data. The information about mentioned indicator is available from 1994 to 2009. Growth rate of this indicator has been, from 1992 to 2000, 107 percent and from 2000 to 2006, 56 per cent. It is predicted that it will be 34 percent by 2009 (Torabi; Mohammad Zade Asl, 2008)

Using e-commerce has opened a way for companies to achieve, not only, international markets, but also to multiply their profits and finding customers to their products quickly. E-commerce includes some benefits that some of them are:

- Increasing the growth of business, sale, income and investment
- Facilitating multilateral commercial, industrial, and economic contracts
- Increasing foreign investment after determining relative advantage of countries
- Developing new business opportunities to industries and businesses enterprises
- Developing new job opportunities
- Innovating in products
- Reducing overhead costs, and providing competition at the international level
- Developing quick access to information (Khani, 2006)

The main objectives of e-commerce can be summarized in the three following categories:
Process Improvement, Controlling Costs, Generating Income (Mokhtari, 2009)

According to the above items, and particularly access to supra market, high-speed service delivery can be considered as the advantages of e-commerce.

But these cases requires appropriate infrastructure such as speed and the influence of Using Internet, in target market, network security, e-commerce rights, Digital signatures, assurance the legality of electronic commitments, electronic banking system to transfer money, as well as obtaining opening electronic and digital credits, electronic customer orientation. The network

should be controlled by the clouds to create and security of infrastructure, actually, if electronic cloud be provided by powerful servers, beside it customers' database will develop. In cloud computing, which has three types, software as a service will bring about great benefit to e-commerce; indeed, these services will prevent installing software, which users require them, on personal systems, and will provide these services online, with higher speed and lower cost, to users. Furthermore in software as a service, result can be observed in targets, so that reducing the cost of installing software, the speed processing the processes, even generating direct income to the provider website; the important thing in software as a service is that it delivers directly to the customers and created value to customers is tangible.

In as mentioned before cloud computing will improve as a result of simultaneous paying attention to society and service industry, it means that, when this new technology can be a tangible and real issue in our daily life that the needs of users being analyzed sociologically and companies can enter to those sectors, as well as understand the needs of industry.

One of the cases is considered in software as a service is that there is no need to software upgrade that will lead to cost reduction. When applications are Web based, upgrading takes place automatically, and the next time that you log into the cloud, these changes are default, and you will benefit from it free of charge (Bagheri, 2011).

Cloud computing will offers you an infinite container to storage. Your computer current 200 GB hard drive, in comparison to hundreds of pet bytes (one million gigabytes), which will be available through the cloud, is insignificant. You can save everything you need to save (Bagheri, 2011).

According to recent research of Ovum institution, in 2011, international companies have strong tendency toward using managed cloud services. Meanwhile, emerging companies in countries such as China, India, Brazil, are introduced as pioneer of employing these services. These companies has started such type of activities with the aim of increase the growth of international activities and obtaining a share of world communication market beyond their borders, so that, by applying cloud computing facilities will be able to accelerate providing necessary resources to service delivery, flexibility in providing services, and the possibility of using variety of pricing models based on cloud computing technology. In Ovum Institute survey of 110 international companies, 45percent of participants announced that they at least has used one of the five services in the areas of data management (data backup and storage), IT systems (servers, operating system, desktop), communication services (hosting sites, web conferencing, content data centers hosting), application software (e-commerce), and network services (virtual private network management, providing resources and sharing networks). As well as 78 percent of the users participated in the survey have mentioned two characteristic of "capacity adaptation, according to the users' needs," and "flexibility in allocating the capacity", as the main advantages of cloud computing technologies, and 70 percent of them have believed increasing the speed of providing necessary resources is other factor of attractiveness and applying this technology.

In another state of cloud computing, i.e. platforms as a service, cloud computing will provide a context to implement necessary software is useful; In fact it - as Google company, which could provide these services by developing Google App Engine- diversified services accessing along

with a series of middleware and at the same time it will perform it the easily. This engine will provides the possibility of executing web applications on Google's servers. Construction, maintenance, traffic and data management is readily applicable in this system.

"Gartner" defines cloud computing, as a computational approach, in which by using Internet technology, scalability capabilities, and dynamism of information technology, is offered to users as a service. Public cloud computing refer to cloud services by a third party provider to external users. In a private cloud computing, accessing to cloud is limited to internal users. Hybrid Cloud computing refer to a combination of internal public cloud computing services and IT services (Smith, 2012).

Gartner, also consider to rapid adoption of cloud computing and cloud services among commercial organizations and emerging of supply side activities, as technology providers maneuver to use the growing business opportunities. In other words, cloud computing is a revolutionary computing method that is resulted from dynamic changes, and convergence of some current trends (Smith, 2012).

After several years of progress, especially in the area of software, it seems that, software as a service, , the key idea of cloud computing - pay for use, multi-user, external service - has found its place. (Smith, 2012)

Different types of IT services which can provide through cloud have made an expansion range. Computing facilities provides computing services; as a result, users can use CPU cycles without buying a computer. Storage services are a way to storing data and documents without requiring to continuous construct of storage networks and servers. Software companies as a service will provide services through shared facilities; therefore, clients can focus on their business without buying software (Smith, 2012).

In other research, it is mentioned that according to Juniper Networks forecasts, international cloud computing actors, such as Amazon, Google and Apple over the coming years (up to 2016), annually will earn about 6.5 billion dollars by providing this services. Furthermore, it is predicted that by 2016, annual revenue of cloud services to major investors in this area (such as operators) will be about 39 billion dollars .

As it has been presented in other studies, Cloud computing has created new ways to electronic commerce development, and even at the same level, has improved Internet usage and Internet-based e- commerce. In e-commerce that online trading are considered as its base and principles, cloud computing is required to be online. Virtual worlds in the coming years will move toward clouds, because companies have to increase their income, by reducing costs and the speed of delivering service.

Companies such as Google, Microsoft, and Apple, have been so relied on cloud services that even there is no need to buy hard drives, These companies, with applications of Google Drive, Sky Drive, I Cloud, has allocated a capacity of 5 gigabytes (Microsoft GB 7) to users free of charge, and to 100 GB and other capacities, will provide these online services by receiving costs annually.

The safety of these clouds is important, and one of the negative points of clouds is based on it, that is, it should be able prevent availability of individual's information to all users, and safe it from hackers. What is important is that there is no other exit, and the future belongs to cloud computing.

3. Conclusions

According to the needs of today, the knowledge of information technology and its relation to other sciences have created a positive synergy in performing services and providing products. Using information technology in business has contributed to create new markets, so that a significant proportion of commercial transactions take place in electronic market. And this amount will increase strongly in the future.

Cloud computing has taken a further step, and by eliminating intermediaries and offering online software, providing online space, more security, more speed, and relying on powerful servers, has created new rhythms in e-commerce.

According to approaches of companies such as Google, Apple, and Microsoft which provide these services, and are innovator and pioneer in this field, there will be more transaction and more profitability.

According to juniper networks forecasts international cloud computing actors, such as Amazon, Google and Apple over the coming years (up to 2016), annually will earn about 6.5 billion dollars by providing these services. Furthermore, it is predicted that by 2016, annual revenue of cloud services to major investors in this area (such as operators) will be about 39 billion dollars . The benefits of cloud computing can be demonstrated by survey in 2011 to the commission that as a result of adopting cloud computing in 80 percent of organizations, there have been10 to 20 percent cost reduction, and the advantages as using cell phone, productivity, standard, an opportunity to start new business and market have been 46, 41, 35, 33, 32 percent, respectively. All economic studies also confirm the importance of cloud computing, which is expected to rapidly growing around the world.

conducted preliminary study to the Commission estimates that Public cloud production have resulted in providing 250 billion Euros per year, providing gross domestic product in 2020, with cloud-friendly politics in comparison with 88 billion Euros per year, without scenario has resulted in intervention which will lead to cumulative effects from 2015 to 2020 that its income will be more than 600 billion Euros (EU Economic Commission for Europe 2012).

What is apparently predictable is incremental contribution of cloud computing in e-market in the future years. This paper has tried to study the impact of cloud computing on electronic commerce briefly. What is important is that, there is, in Iran, very little research and study about cloud computing and e-commerce, therefore, paying attention to the chance of acting in the field of it and cloud computing, to promote organizations e-culture, as well as to make new job opportunities, electronic information sharing in business, developing virtual space for users, and facilitating in using the speed of applications and their quality to users of communication companies, is necessary. And progressing in it will create a favorable environment to information technology, will help growing electronic market that as a result will increase transactions and business exchange as well

as will lead to thriving trade and business and is a step towards sustainable development of our country Iran.

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