Cloud Computing and E-commerce in Small and Medium Enterprises (SME's): the Benefits, Challenges

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Abstract: ***Nowadays the term of cloud computing is become widespread. Cloud computing can solve many problems that faced by Small and medium enterprises (SME's) in term of cost-effectiveness, security-effectiveness, availability and IT-resources (hardware, software and services). E-commerce in Small and medium enterprises (SME's) is need to serve the customers a good services to satisfy their customers and give them good profits. These enterprises faced many issues and challenges in their business like lake of resources, security and high implementation cost and so on. This paper illustrate the literature review of the benefits can be serve by cloud computing and the issues and challenges that E-commerce Small and medium enterprises (SME's) faced, and how cloud computing can solve these issues. This paper also presents the methodology that will be used to gather data to see how far the cloud computing has influenced the E-commerce small and medium enterprises in Jordan.***

Keywords: Cloud computing, E-commerce, SME's.

1. Introduction

Information technology (IT) is playing an important role in the business work way, like how to create the products, services to the enterprise customers [1]. Nowadays, the growing of IT innovation led the organization to make a decision to adopt new technology to solve the organization computing needs, to support their services, products and to satisfy their commerce operation need to create a large infrastructure of Information technology and resources employment [2]. One of these technologies Cloud computing. The cloud can give Privileges to the enterprises in general and specifically for small and medium enterprise. These Privileges like cost saving, availability, services, security and resources. In other word, cloud computing is a computing services like E-mail, customer relationship management (CRM), office application and exchange information over internet between enterprise departments [3]. Cloud computing concept has been discussed widely and has attracted many enterprises. Among the reasons claimed are the flexibility and efficiency that become a must for enterprises to do businesses [4]. Electronic commerce (E-commerce) in small and medium enterprises nowadays become famous and most of the enterprises established E-commerce to gain profits [5], but these SME's are faced many issues and challenges like security, cost implementation and cost saving, high performance of services and infrastructure. Cloud computing can solve many problem that faced Small and medium enterprises by giving them high performance of services, infrastructure, cost saving and security.

2. Cloud computing

Many researcher defined cloud computing, according to [6] "moving computer applications and programs to the Internet from the desktops". NIST define the cloud computing as "Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction." [7]. From the definition of NIST there are four main services classified as cloud services which are; Cloud providers and infrastructures, cloud platforms, cloud software's and cloud data storages. Most researchers [7-13], focused on three classifications which are Infrastructure as a Service (IaaS), Platform as a Service (Paas) and Software as a Service (SaaS).

2.1. Cloud Computing Layers

There are three main layers for cloud computing Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS) [8, 14, 15]. Infrastructure as a Service (IaaS) the capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls). Platform as a Service (PaaS) the capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations. Software as a Service (SaaS) the capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g., web-based email). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual

application capabilities, with the possible exception of limited user-specific application configuration settings.

2.2. Cloud Computing Deployment

There are four cloud deployment models Public cloud, Private cloud, Hybrid cloud and Community cloud. According to [16] a public cloud is services and resources clouded over internet to provide web site services and resources online. These public clouds offer services for organizations and users to benefit for the web site shared resources. Based on [14] A private cloud is The cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party and may exist on premise or off premise. The main aim of private cloud is to share the data, services and resources between the employees inside the organization. Therefore, through private cloud provide efficient work environment to maximize the performance of organization's outcomes and save the time and money costs. The Hybrid Cloud is combination between private and public cloud [14]. Through hybrid cloud the organization can provide some task using public cloud and other tasks using private cloud.

2.3. Cloud Computing Benefits

Many researcher have stated cloud computing benefits, based on [15, 17] cloud computing supports Cost saving, scalability, Availability, Innovation speed, Efficiency, easy management and Disaster Management. Table (1) illustrate the set of benefits that offered by cloud computing

Table 1: The benefits set of Cloud computing

Benefits set	*Description*
Cost saving	By cloud the organization extremely reduce spending on IT-resources
Scalability	cloud services enable the rapid adaptation of IT to changing business needs
Availability	Larger cloud providers can offer high availability due to their ability to scale
Innovation speed	In contrast to traditional IT projects, cloud services can be provisioned with just a few hours' notice, rather than weeks or months.
Efficiency	With efficient IT in place, an organization can focus on its core business and invest innovatively into research and development. This cloud solution advantage can not only mean a substantial contribution to the growth and competitiveness of an organization, but also exceed the financial benefits it realizes
Easy management	The maintenance of the infrastructure, hardware or software is simplified.
Disaster Management	In case of disasters, an off-site backup is always helpful. Keeping crucial data backed up using cloud storage services is the need of the hour for most of the organizations.

These benefits offered by the cloud can influence many organizations to make adoption decision in the cloud.

3. E-commerce in small and medium enterprises (SME's)

The definition of electronic commerce**,** Any operation of transaction and selling products online between organization and any third party it deal with its E-commerce [18]. E-commerce can be categories as [19-21]:

1) Business-to-Business (B2B): its mean the E-transaction among businesses.
2) Business-to-Consumer (B2C): its mean the Enterprises sell directly to the consumers.
3) Consumer-to-Business (C2B): its mean the Consumers selling products to the Enterprises.
4) Consumer-to-Consumer (C2C): its mean the business transaction between users or consumers. The users sell products between them via internet.

3.1. The benefits of E-Commerce

Nowadays the people can buy and sell anything without need to any market or shop just they need an internet and computers or mobiles to selects what they want from the popular E-commerce sites in the internet [19]. It is easy and flexible to the seller and the buyer, and even the civilization. The benefits to Consumers: According to [22] the buyers will find the ease and convenience with E-commerce, and will gain more time than going to the shop to buy what they wants. The customers can surf more than one vendor in the same time. The benefits to business: According to [20] has been summarized the benefits of e-commerce to business into :

1) E-commerce provides an international marketplace for businesses. With e-commerce, businesses have access to people all over the world.
2) E-commerce saves operation cost for businesses because the cost of storing, processing, distributing and telecommunication has been decreased.
3) The pull-type processing of e-commerce allows for products and services to be customized according to the customer's requirements.
4) E-commerce enables the digitization of products and processes such as software and music/video that can be downloaded directly from the Internet by customers.
5) E-commerce breaks the constraints of working time. Businesses can contact customers and suppliers at any time.

The benefits to society: Society can also benefit from e-commerce from the following perspectives [20]. As e-commerce allowing people working at home, it enhances the quality of life for people in the society. It is not only more convenient for people but also reduces environmental pollution potentially because fewer people have to travel to work regularly.

1) People in rural areas are enabled to access and enjoy products, services and information by e-commerce.
2) E-commerce facilitates the delivery of public services such as health services. It is popular to consult doctors or nurses online nowadays.

3.2. E-Commerce Challenges and Issues

Many issues faced e-commerce small and medium enterprises (SME's) to support their works and customers. These challenges can be summarized in the table (2) below:

Table 2: The issues and challenges of E-commerce

Issues	*Description*
the cost	Ecommerce SME's need to high implement cost to give good services to their customers and to support the organization business implementation [23]
Lack of technology and technical people	E-commerce services need high performance of hardware, services, and software to give good typical services to the customers and to avoid the competitive pressure with the other enterprises [19]
The security	The customer data, such as recent purchase, income, address, credit card number, credit history and other personal information that are collected electronically by SMEs via Internet web enabled cookies and sometimes spyware. Spyware enables an individual or a company to monitor and gather information on the activity of a computer user that raises some privacy and security issues [24].
Availability	the availability need a business process, working practice, the management of change, and the need to evolve new ways of thinking, behaving and organizing [23-25]

4. Cloud computing with E-commerce

Cloud Computing and e-commerce are two buzzwords nowadays. According to [19] They are popular because both of them are cost-effective. Cloud Computing saves organizations the cost of IT infrastructure [26], while e-commerce allows merchants to do business without renting or buying an entity shop [21]. Cloud provides positive opportunities for e-commerce, but before adopting it, companies should have a trade-off [19]. Many researcher illustrate that cloud computing and E-commerce the most attractive industries has being developed at high rate in recent years, with the Political, Economic, Sociological and Technological factors have had a positive impacts on its development. Table (3) below explain what the researcher said about E-commerce and cloud computing:

Table 3: The E-commerce and cloud computing description by different researcher perspectives

The Researcher	*Description*
[19]	1- The rapid growth of the world economy accelerates the developing of online transaction. 2- Online shopping is becoming a new trend as it is more convenient comparing to traditional shopping. 3- The information security technologies are developing fast
[20]	1- The level of education and IT skills of consumers have been improved. 2- The developing of telecommunications infrastructure accelerates the development of e-commerce Industry.
[27].	1- User's willingness and ability to adopt new technology. 2- Cloud Computing gives the chances for small-sized and middle-sized companies to move to the Internet with less effort.

5. Methodology

In figure (1) below show the methodology stages will be apply for this research. The qualitative and quantitative approaches will be used in this research by used open-end interview questions with CIO/IT managers of E-commerce small and medium enterprises (SME's), by the interview the researcher can be identify the E-commerce issues and challenges among Jordanian E-commerce small and medium enterprises towards applying the cloud technology. The quantitative approaches will be used as a tool to evaluate the proposed model by distribute the questionnaire on the employee of E-commerce SME's in Jordan. The outcome will be the model to solve the E-commerce problems by using cloud technology and to help them to make a decision to adopt the cloud technology among the factors will influenced that SME's needs.

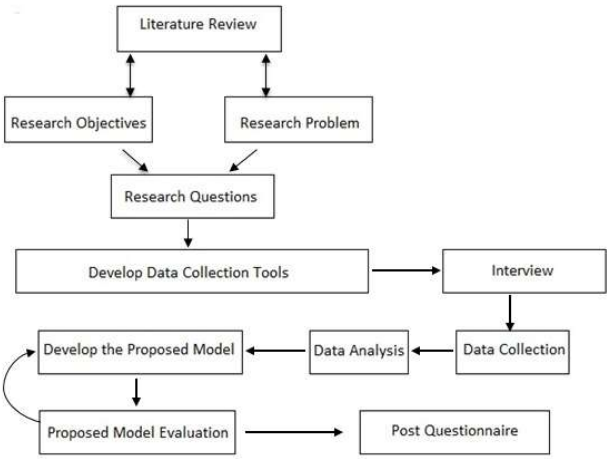

Figure 1: Research methodology stages of this study

6. Conclusion

Cloud computing services can support and give a considerable opportunity to Small and medium Enterprises in general and E-commerce Small and medium enterprises in specific, in order to the lack of IT-resources and infrastructure. However, cloud computing can give a benefit to the SME's and in the same time there are several issues and challenges that should be careful when applying this technology. The adoption decision of cloud computing by E-commerce SME's will chief to make a great change in the enterprises. The aim of this study is to investigate the behavioral intention of E-commerce SME's to use or not cloud computing technology among E-commerce Jordanian enterprises. In addition, this paper is reviews of cloud computing and E-commerce previous study have been done by many researchers to give illustration about the cloud technology and E-commerce by many perspectives and the issues that may face the E-commerce SME's implementation among Jordanian E-commerce small and medium enterprises.

In the future, this study can be extended by evaluate more factors that could influence the adoption decision of cloud computing, and evaluate the acceptance and readiness of Jordanian E-commerce small and medium enterprises (SME's) toward Cloud computing technology.

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