Implementación del cómputo en la nube: análisis de los beneficios reportados en empresas del sur de Sonora del sector productivo y de servicios

Cloud computing implementation: analysis of benefits reported by productive sector and services companies of south Sonora

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RESUMEN

En la actualidad el software ha cumplido funciones muy importantes que llevan a facilitar procesos y realizar actividades con un mejor desempeño y rapidez, siendo innumerables los beneficios obtenidos de su buen uso. Las organizaciones del siglo XXI tienen algunas problemáticas, una de ellas es que deben reducir gastos, para lo cual requieren optimizar sus procesos operativos e implementar controles para crear mejoras y detectar focos rojos.

Por esta razón, es necesario hacer uso de los sistemas de información, mismos que sirven para crear estos controles, y lograr ayuda para la toma de decisiones en las organizaciones. Además, se aprovecha el internet para así poder crear un vínculo que hará posible el acceso a la información de las operaciones de sus empresas por parte de los directivos, desde cualquier lugar del mundo, solo con tener acceso a la Red Global.

Palabras clave: tecnologías de información, sistemas de información en la nube, software.

Abstract

Nowadays software has fulfilled important functions that lead to simplify processes and activities with better performance and speed, being innumerable benefits obtained from good use. The 21st century organizations have some problems, one of which is that it should reduce expenditure, which requires optimize its business processes and implement controls to create improvements and detect red flags.

For this reason, it is necessary to make use of information systems, same that are used to create these controls, and support for decision-making in organizations. In addition, the internet takes advantage to be able to create a link that will make it possible to access to the information of the operations of their companies by managers, from anywhere in the world, only to have access to the Global Network.

Key Words: information technology, information systems in the cloud, software

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Introduction

Most companies need Software that simplifies business operations to them. With the arrival of the Internet in most organizations, these have a new option: the use of Control Software in the cloud, which is a viable option that helps organizations to minimize costs for operating controls through software and also spend less money on the implementation of these information systems in the company, managing to save costs in purchase and installation of servers and not have the need to absorb the costs of maintenance of hardware as commonly happens to have seasonal software.

Problem Statement

The world in which we live is constantly changing; who has the information, has advantage over who does not have it, and those who have information in real time and 24/7 availability, is a step forward who only has the information. However, so organizations have the necessary information in real time, they need information technologies, which

formed part of the majority of companies today. It is common that each undertaking which is or exists, is necessary to have at least one computer, whereas it will help boost the development of the organization. Despite the existence of great variety and quantity of commercial management support software, often only used the computer as a data store; contemplating it the registration of sales, purchasing, inventory and human resources, mostly for the purpose of making decisions at any given time

In this research the benefits found by implementing information systems in the cloud that have obtained companies in southern Sonora are denoted. In her direct observation of the benefits accruing to members of companies, among those managers, administrative assistants and other staff plasma. Administrative are the most in need of these services and those who get most out of the implement.

The benefits most frequently found are: share information, reduce duplication of files, implement operational controls, data access and remotely from mobile devices, have more control inventory and reduce development and deployment costs. The above represent the competitive advantages that companies can have with the implementation of information technologies in the cloud.

To carry out the research was based on the following question:

What are the main benefits of implementing operational control software in organizations in southern Sonora?

This research was conducted in organizations in southern Sonora.

Objective

Understand the main benefits of the management of operational control in the cloud in the southern region of Sonora.

Background

For teachers, the technologies available to them various digital resources: software, documents, website, etc. .; facilitate participation in and support networks of teachers work in collaborative projects with other schools (Collins 1998). Another author, F. Cisneros (2009), in his research shows that success for technological innovation in education

depends largely on the performance of the teacher, which is determined by their training in new technologies. Moreover, the study of Martínez JL (2008), reflects the lack of training projects and training in the use of ICT.

With regard to the use of new technologies they have been developed research showing the benefits of its use in organizations. Information technologies can be a competitive advantage; in this connection, Somers and Nelson (2002) consider that the business strategy is related to the organization, technology and strategic decisions of operations (organization, technology, quality and location, talent management, etc.) that support business strategy. The key in developing the capacities of information systems (IS) of the company is know how to articulate the strategic role and management of the SI itself by defining appropriate IT architecture and a control structure to facilitate their development and exploitation (Stratman and Aleda, 2002).

In another investigation, Paulo André da (2010) mentions that ERP systems are supportive to management, we mentioned that Menezes Conceição systems enterprise resource planning (Enterprise ResourcesPlanning ERP) facilitate the integration and optimization of processes business by applying information technology.

Hong and Kim, 2002, mentions that the environment and the operation of small and medium enterprises (SMEs) are different from those of large companies and this affects the implementation of an ERP. Although much research has been its implementation in large companies, there is less information on the impact of ERP in SMEs and how benefits are obtained after its implementation; nor the factors that have hindered or facilitated optimal performance are well known. Factors that should be managed in this phase are: the definition of the strategic objectives of the ERP, the management commitment and readiness to structural and cultural change (Motwany et al., 2005). Rajagopal (2002) the phase called "adoption", proposes a model consisting of six phases and suggests as typical activities, the investment decision, the cost-benefit analysis and the choice of technology and vendor.

Select the right ERP requires consideration of the needs arising from the strategy (information obtained from customers, suppliers and competitors). Furthermore, the characteristics of an ERP that facilitate business process reengineering are: the scope, system configuration capability and capacity for integration; can apply different combinations of the BPR (Business ProcessReengineering, reengineering business processes) and ERP perspective with a view to achieving the integration required functional processes (Koch, 2001; Ugrin, 2009).

Theoretical framework

a. Computers

A computer is an electronic device that allows you to process data into information useful. Computers are able to perform calculations and make much faster than a human being logical decisions. Every computer is composed of hardware and software.

a. Hardware

Is all you can touch a computer, are all interconnected electronic devices.

In essence, a computer is a device that gives input, processes and stores data and produces output; all in accordance with a set of stored instructions that are called computer programs.

The usefulness of computers is that they help you to process large volumes of information in a short time, can permanently store information to make better decisions and a lower rate of error.

b. Software

The software refers to programs and data stored on a computer. In other words, instructions are responsible for the hardware (the machine) to perform its task.

The language used by the software to communicate with the hardware is of binary type, it comes in the form of instructions, which are executed by each of the parts of the hardware (monitor, mouse, keyboard, printer, CPU, CD-ROM , hard drive, etc.).

The software can be divided into three basic categories:

System software, application software, programming software, system software. It is the basic software or operating system. It is a set of programs that control the work of the computer. It is responsible for managing and allocating hardware resources.

Application software: are the programs that control and directs the various tasks performed by computers, creating a friendly atmosphere between the PC and the user. They perform tasks of word processing, database management and the like.

Programming software: programming languages are, interpreters, compilers, and similar applications used by system developers.

b. The new technologies

The new information technologies and communications have, day by day, a greater presence in all aspects of work and personal life (Schoemaker and Jonker, 2005;. Breivold et al, 2012), providing a new space for innovation areas such as industry, services, health, administration, commerce and education.

Consider Information Technology and Communication both set regarding the transmission, processing, storage and maintenance digitized information such as the set of processes and products derived from the new tools tools (ie, both hardware and software) (Longley and Shain, 1985).

Including the word "New" is because there are other earlier technologies, as is the case of the phone, which also refer to information and communications, but that would not be collected within the concept of NTIC. In other words, ICTs are about the use of hardware (computer, Smartphone, etc.) and software (different applications such as ERP, CRM, etc.) that can transform, store, manage, protect, disseminate and locate information needed for any activity human (ITAA, Adelman, 2000).

c. Technology

A technology may be hardware and software. A computer system is the set of technologies that interact. The computer system takes data from the environment (input), analyzes and processes the data, stores (process) and finally the end product displays the information (output), which can be used to perform an action on the environment (feedback).

d. Organizations and the internet

The widespread use of ICT in the world has resulted in a major change in the global economy, particularly in industrialized countries, adding to the traditional factors of production to the generation of wealth, a new factor is strategic: knowledge (Craig, 2007). This situation requires our economies and, ultimately, to our companies to develop products and services with higher added value (Perez and Dressler, 2007), evolving into models in which the importance in industrial processes is replaced by relevance processing of information and knowledge as key economic (Schoemaker and Jonker, 2005).

Thus, in the new competitive environment of companies is compromised by two interrelated aspects: first, an intensive and rational use of information technology and communications, which creates value for the organization and promote the second aspect , knowledge, critical resource companies (Lueg, 2001). The fact that the organization professionals have more information and knowledge available is the key to sustainable competitive advantage over time (Shoemaker, 2001). That's why you and not only talk about the "information society" but also the "knowledge society".

e. Basics of cloud computing (cloud computing)

There are various definitions, some simple and others more technical. Its name comes from the way it has been represented in diagrams, the appearance of computers connected together. It may have been "the network", but was named the "cloud" and according to (Gutierrez, 2010): The cloud is a term that refers to how a network of computers (grid computing) as service provider software and data, where Grid computing is a set of interconnected computers that share resources. It is a processing model that allows faster results than could be achieved with a client-server model, in which a central server (MainFrame) concentrating all transactions and has all the information and data exists, as well as business logic. On the other hand, when the client (user) makes a request to the

cloud is attended by many computers thus achieving much faster time response and better availability because the system does not depend on a single server.

National Institute of Standards and Technology Department of Commerce of the Federal Government of the United States defines cloud computing as follows:
"Cloud computing is a computing model that allows, from anywhere, in a practical way, on-demand access and through the network to a shared set of configurable computing resources (eg, networks, servers, storage , applications and services), which can be rapidly provisioned and released with minimal management effort after and little interaction with the service provider. " (NIST, 2011).

Trying this with a more colloquial language, Plummer (2012) defines it as follows:
"Cloud computing means that someone else is responsible for managing computers and software, while you only use what you deliver and concentrate on evaluating the quality of service."

Added to this definition, Plummer invites to think that cloud computing are resources that anyone can use without owning them. Everyone pays part of the cost, thereby decreasing the total expenditure for all.

Method

Case studies, a research design facing reality through a detailed review of its elements and the interaction that occurs between them and their context analysis was used to arrive to conduct the investigation in a process of synthesis search the meaning and the decision on the case.

Bell (2002) argues that the case study researcher aims to identify the features and show how they affect the implementation of systems and influence the way of functioning of the institution.

The appropriate method according to the objective of the investigation was considered, especially if the information was obtained through semi-structured interviews with staff organizations in the region. As a complement, in the investigation several visits were conducted to obtain information through comments on the use of new technologies.

To carry out the research were interviewed ten private and public organizations in the city of Navojoa. Organizations that were considered for the study were:
Clarvi, Comptroller of the State of Sonora, Kowi, Bioderpack, CMIC Navojoa, Sonora ITC, XXI Building, Hospital San José Navojoa, digging, Exim Foods.

Analysis and interpretation of results

With the analysis of interviews and direct observation to the people using the information systems in the cloud, organizations in southern Sonora the following findings were obtained.

Organizations are aware that they need to use information technology, and a good option to reduce costs is the use of software in the cloud, this because of the great benefits found in their use. Among the major benefits for which these companies lean toward using "cloud" are information systems that help management in decision-making, increases operational controls, based on the detection of incidents, among others . (See Table 1).

Table 1. Expected benefits organizations in Southern Sonora
with the implementation of information technology in the cloud.

Organizaciones	Beneficios
Región sur de Sonora	Aumentar controles. Detectar incidencias. Reducción de los inventarios. Apoyo a la gerencia y toma de decisiones. Mejor seguimiento y control de los materiales. Reducir daños al medio ambiente al minimizar papeleo.

Source: direct information

Companies in southern Sonora are concerned about being at the forefront, so they are willing to implement information systems in the cloud for their businesses, which represents an opportunity in a land unexplored; It requires breaking old patterns. It is difficult, however, requires technological development being at the forefront.

We found that are among the main benefits of implementing cloud software: having access to data from any device, without being in the same location; save on software and hardware implementations; improvement of operational controls (see Table 2). The novel software systems can help organizations achieve advantage over competitors by allowing them to access information and make better analysis in less time.

Table 2. Main benefits of implementing Software in the Cloud.

1.	**Acceso a los datos desde cualquier sitio con Internet**
2.	Ahorro en Software y Hardware
3.	Ahorro en mantenimiento técnico
4.	Mayor equilibrio en las operaciones
5.	Mejora en controles operativos con apoyo de la Nube
6.	Compartir información evitando la duplicidad de datos.

Source: Direct Information.

Despite the great advantages that are obtained from information technologies, there is a lack of benefits they can get organizations to implement operational controls in the cloud. Then each found key benefits described.

1. Ease of access to information.

Thanks to the cloud can access information from anywhere with Internet access, only to have the Web address of the application, have a username and password. In this way, managers and corporate managers can monitor the activities and transactions that the company carries without requesting the information to others, it is processed and analyzed in order to reach the hands of whoever requests it. So that using "Cloud" information is always at hand and the time required, accessing it from any device with a browser.

2. Benefits of centralization of information

The information is stored in databases on a server with Internet, and the problem of having the information stored in each computer, ie, all information is stored in one place is avoided. The software is also installed in one place, thus avoiding having to install the software on each computer seasonally requiring access to information.

3. Savings Hardware and Software

As information and application stored on remote servers it is no longer necessary to install local servers. Costs must solve the providers who care about the technical updates, they are also responsible for switching to a more robust server if necessary, even without that final customers could persuade. They should keep the software updated servers to avoid problems of cyber attacks; the end user will not notice of such updates or negative effects will occur in the organizational processes.

4. Savings in maintenance service

The costs of maintaining servers go by the service provider, in this way, companies do not have sufficient solvency to access the benefits of information systems, with the use of the cloud these costs are saved.

5. Improved operational controls

Operational controls are of direct concern as most software only cover the administrative side, however, with the use of cloud implementing operational controls power to the system from the labor camp and facilitates same which it is almost always out of the office. With the cloud new doors to be developed in open online platforms, they can feed information from the field in tablets with 3G technology, and monitor information from the offices by administrators.

1. Savings in development and implementation time

Most companies asked to install software because they have problems in the organization. Think solve organizational problems with information technology, however, when it comes to seasonal Software it is greater deployment time, since it also requires verification of compatibility with devices and computers. By contrast, with cloud software only a Web browser to access the application is required.

2. Increased commitment from service providers

Cloud services have come to change the paradigm of business software. In most of these services to monthly payments policies are used, unlike the seasonal Software

that is made in one installment most occasions. This new business model creates a greater commitment to keep the insurance provider and online service 24/7.

3. File Sharing

When information is lagging, companies stagnate. One of the major benefits of the cloud is that promote the sharing of information, however, certain measures are taken, one of which is the hierarchy of roles and access levels, as is done with the support of the directors of the company.

4. Environmental Impact

A major concern is the global environmental impact of information technology, but there is a point in favor of companies that use the Cloud, an example is when Office is deployed in the cloud, and reducing costs to not be necessary to print as electronic trades are automatically shared with the people in the organization who require it.

5. Information Security

Contrary to common belief, Cloud systems are safer than the seasonal Software, as being information stored on these servers and physically housed in remote locations and in most cases with mirror systems, unlikely that the information is lost. As already mentioned, is the commitment of suppliers to ensure the integrity of the information and give the necessary recommendations to avoid problems of technical security and social engineering.

Conclusions and recommendations

With the rise of information technology in recent years, these have changed the way they operate today's organizations, which have had to adapt to new technologies, so that investing in information technology to achieve minimize costs.

Information technologies have become a necessity in business, loc aul reflected when implemented in most organizations May, however, there is a new trend that has come to

change the paradigms of exchange of information, and save small businesses that do not yet have enough money to perform server deployments so they can store information required for decision making. The "Cloud" offers great benefits to companies with little investment: data analysis can be done anytime, anywhere and from any device with Internet access, useful for business executives and process owners, who may be the pending them with just one click.

Recommendations to exploit the benefits of information systems in the cloud and reduce costs. Companies demonstrate the benefits of using ERP and CRM systems in the cloud, as Planner Resources Company.

The ERP is an integrated business management system that is designed to model and automate most processes in the company (area of finance, trade, logistics, production, etc.). Its mission is to facilitate the planning of all resources of the company, whose profits will control costs, inventories, among others, in a unified manner.

Only a system to manage many of their business processes, integration between the functions of the applications, reduce management costs and increase return on investment.

Benefits of CRM: the computer systems that manage CRM improve the performance of organizations that have a relationship with customers very precarious manner, so that these implementations create a circle of trust between companies and customers, forming a bond that strengthens their relationship. Thus, organizations know their customers and can offer personalized service, running less risk of losing important customers and find potential customers.

The cloud solutions are the most effective for businesses that do not require to have a department. The hardware, physical facilities, software development and maintenance are aspects which organizations would cease to worry if applied cloud solutions, allowing them to focus their efforts on improving their production processes or quality.

The organizations often unknowingly make use of cloud services consistently, for example, is usually check email from a web page as in the case of Gmail or Facebook.

Advantages of the cloud, accessible from anywhere and with multiple devices. Your programs and files in the cloud, so you just an Internet connection to access them and use them remotely.

This can be done from a home computer, a laptop, a Tablet, PC, iPod, Smartphone. All software is in one place, it avoids having to install software on computers, laptop or each and every one of the many teams of organizations. To advantage of companies, not only avoids installing the software, but it is also unnecessary to make updates on each computer that has installed some application that requires. In parallel, they are minimizing compatibility issues. For the methodology of the cloud work in an organization, the only requirement is that devices have installed a web browser with which to work on it. Another key factor is to have internet service.

Still they dominated the advantages for both providers and cloud services for organizations. When implemented cloud saves on software and hardware. In the cloud, the same program is shared by many users without having to buy a separate copy for each of them. Thus, costs of hardware, software, maintenance of software and large expenditures in information storage devices are minimized. In the end, organizations are less concerned with technology infrastructure and more focused on the use of software that the cloud provides.

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