

ADVANTAGES OF CLOUD SUPPLY CHAIN MANAGEMENT SYSTEMS FROM THE POINT OF VIEW OF THE SERVICE PROVIDER

“An Empirical Study of Cloud Computing Companies in Saudi Arabia, Jordan and UAE”

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ABSTRACT

Many businesses have recently applied cloud supply chain management to improve the efficiency and effectiveness of procurement functions and activities, and on the other hand to improve performance and reduce costs. In this regard, the study examined the advantages of implementing the cloud supply chain management system in businesses by identifying the advantages that cloud computing adds to the supply chain management systems by distributing a questionnaire to the cloud supply chain management services providers. The results showed a summary of eleven (11) major advantages, these advantages were arranged according to importance based on the service provider's opinion.

Keywords: Supply Chain Management Systems, Cloud Computing, Cloud Supply Chain Management System Features.

INTRODUCTION

Cloud computing became a very Important aspect for business and a hot topic for researchers. The implementation and use of cloud computing are booming. The main goals in using cloud computing are minimizing the Information Technology cost and enriching the value of information by expanding the base of users using this information. It delivers services that help in providing on demand technology infrastructure with the highest level of service (Lamba and singh, 2011).

Cloud computing is providing hardware resources with high capacity of storage, Database management, and advanced and developed software services. Its used for sharing information, software, resources over the internet and upon demand (Chandran, S. and Angepat, 2010)

Benefits of using Cloud Computing

The use of cloud computing became a target for large organizations; they are implementing cloud services such as Office 365 and Docs sharing. Almost 77 percent of large organizations are using cloud computing to a certain level (Skendrovic, 2013). It enables real-time interaction, latest technology and solutions available and does not require large investments comparing with the traditional technology and software infrastructure (Lin and Chen, 2012)

Cloud computing technologies can be implemented over different kinds of architectures, under wide range of services and models, also cloud computing can be merged with different technologies and software design approaches (NIST, 2011).

One of the major features that cloud computing providing is that it can be accessed from anywhere. It is providing the on-demand self-service, which help the end user to eliminate the

human interaction with a service provider such as Google Docs to be used by researchers and academics. Because all the data is automatically saved and backed up on huge and secured servers. In addition, Google have a promised 99.9% uptime depending on internet connectivity and disaster recovery. (Yeboah, Essandoh, 2014)

Cloud computing is considered as a lower computer costs because companies do not need a high-powered and high-priced computer to run cloud computing's web-based applications. Since applications run in the cloud, not on the desktop PC, the desktop PC does not need the processing power or hard disk space demanded by traditional desktop software. On the other hand, when companies are using web-based applications, the PCs can be less expensive, with a smaller hard disk, less memory, more efficient processor. In fact, in this scenario does not even need a CD or DVD drive, as no software programs have to be loaded and no document files need to be saved. (Gutierrez, et al. 2015)

Cloud computing can improve performance with few programs installed in the company's computer's memory. In addition, system boot can run faster and instead of purchasing expensive software applications, companies can get most of what they need using cloud computing. (Chen, et al. 2018)

Another advantage to cloud computing is that companies are no longer faced with choosing between obsolete software and high upgrade costs. When the application is web-based, updates happen automatically getting the latest version of software and applications with document format compatibility. There are potentially no format incompatibilities when everyone is sharing documents and applications in the cloud. (Gangwar, et al. 2015)

Cloud computing offers virtually limitless storage with the benefit of computer crashing in the cloud should not affect the storage of the stored data, it is known as data – safe computing platform. Data, files and documents are instantly available from everywhere and can be accessed universally and allowing better collaboration by sharing the data. (Dahlberg, et al. 2015)

Supply Chain Management System

Supply chains are an increasingly important phenomenon because of their association with controlling the costs of enterprises. Supply chain management relates to managing the flow of information, materials, services and funds through any activity in a way that maximizes the effectiveness of operations. In 1990, for the first time, academics developed the term supply chain management. The importance of supply chain management (SCM) has increased since the early 1990s, although this concept was introduced in the early 1980s. This method was derived from the fact that there are dependencies between levels in the channels from the starting point to the point of consumption. (Awad, Nassar, 2010)

It can be said that supply chain management is the existence of automatic integration of demand from customers to the needs of suppliers through the Enterprise Resource Planning (ERP) assessment system, the term "supply management" depends on the concept of systems management where it seeks to achieve the optimal elements of material costs, quality and service, The following activities: procurement, transportation, storage, quality assurance, and inventory management of materials received by the organization as well as the internal distribution of resources, these activities are usually combined under the name of materials management in the organization. (Fayezi, Zomorodi, 2015)

Supply chain management can be defined as upper flow management and bottom flow for value addition flows for materials, finished goods and related information between suppliers, organization, vendors and end customers. (Qrunfleh, Tarafdar, 2012)

One of the fundamentals of supply chain management is that there is no profit for a particular party at the expense of another party's loss which called zero-sum. All parties must be win-win, so supply chain management is not what some believe is just a new logistics name or it is intended for a specific part of the administrative or operational functions, such as the procurement function only or production. It includes everything related to the production or service process, from the purchase and transfer of the raw materials, the completion of the production process, marketing, sales and customer service, as well as all the different flows required by the various stages. (Manders, et al. 2016)

Many tools can be used to facilitate the management of the supply chain in the organization such as: Internet, information exchange tools, business supply chain planning programs, and software implementation of the supply chain business. These programs are used to improve the efficiency of the supply chain and to minimize inventory, based on the accuracy of constantly updated customer demand, plant capacity and product delivery capabilities. (CERASIS. 2018)

E-business therefore has a significant impact on the integration of supply chain activities and the extent to which businesses benefit from business through which supply chain activities can be integrated and benefits such as cost reduction, increased business flexibility and responsiveness. Integration in the supply chain is based on four pillars: information integration, planning integration, business flow coordination, and continuously updated business models. (Qrunfleh, Tarafdar, 2012)

To ensure continuity of the supply chain, there must be conditions such as: long term, flexibility, cooperation, continuous information sharing, commitment to constantly updating the tools used in supply chain management, and the goal of all is to satisfy the customer. Information management systems have been involved in supply chain management until supply chain management systems have been in place. These electronic systems enable users to access information and access the entire supply chain, providing information on products, services, catalogs, pricing, connectivity and communication with chain partners, Communication with suppliers and the exchange of data between them on their needs for goods and services, and also provide the ability to monitor manufacturing, warehousing, transport and delivery. (Manders, et al. 2016)

Supply chain management systems also contribute to the integration of all parties in the chain, both internally and externally, for each organization connected to the chain. These systems fully supporting all departments within the company, starting with procurement and their relationship to suppliers, marketing and sales departments, finance, human resources and all other departments. On the other hand, all external parties are connected from suppliers to the end consumer. (Fayezi, Zomorodi, 2015)

Modern Supply Chains Management

Supply chains span the world and expand dramatically so that some chains may expand to more than 3,000 companies, some of which are responsible for supplying server materials or components, while the other provides equipment, but their role is indispensable. These chains produce a high flow of data managed through Supply Chain Management Systems (SCMs), a software solution that manage the flow of goods, data and finance as a product or service moving from its point of origin to its final destination. Where it provides information and functions, as the user can access the information and see the entire supply chain. The

activities of the supply chain include everything from product development to logistics services, including production, manufacturing, sourcing, transportation, inventory, warehouse management, and shipping. The customer has access to product information, marketing services, catalogs, prices, customer communication, order management, contact with suppliers, data exchange, purchase orders, the ability to track the production process and warehouses at suppliers in the event of a transfer, delivery or condition at distributors, and the ability to follow local or worldwide factors and provide real information for all of the above. (Hossain, et al. 2015)

Many of the challenges facing supply chain systems have emerged in a booming open global economy because of the extension of the supply chain in multiple countries. This means that goods and information cannot easily cross from one part of the supply chain to the next without effort and high probability for errors. Collaboration in the supply chain should therefore be used to detect, analyze and resolve errors within the organization as well as with the key trading chain partners. As well as complete all string operations intelligently to make the entire supply chain more efficient and responsive. (Varma, Khan, 2014)

After the introduction of the Internet on the operations of the enterprise, the supply chain circuit systems began to be used in the interaction between the parts of the chain, so that the market is more dynamic and work methods more intelligent and more flexible, the Internet provided a complete vision and advanced analysis to help in the planning and identification of the source and delivery of goods and choose the right materials at the time the appropriate. (Ng, et al. 2015)

From the concept of the Internet to the concept of cloud based on the Internet, as the concept of cloud computing and its applications spread and became part of the concept of applications and modern systems. Cloud computing has revolutionized supply chains today. All the supply chain members always need to provide continuous growth in the chain, efficiency and speed, sophisticated and equitable with growth in the surrounding competitive environment, the problem is that the members of the chain are seeking it but they do not care about technology, but their focus is always to administrative of Technology and costs. So, the cloud applications and their platforms are growth catalysts that will keep improving the performance of the supply chain while stimulating and fueling global manufacturing growth. (Lehmacher, 2017)

The cloud providers have been aware of the benefits they can offer to supply chain management systems and have provided many software solutions to support organizations in this area. Many large systems companies have introduced three management options for enterprises: providing chain management systems, cloud management, or Combination between the two options. These companies include SAP, ORACLE, Microsoft, epicor, Amazon, velocitycloud, actifio, ECT... Each of these companies promotes its cloud product by offering the benefits it adds to supply chain management. Many previous studies have suggested the benefits that cloud computing can provide to supply chain management systems (Jun, Wei, 2011. Korpela, et al. 2017. Schrödl, Turowski, 2011. Hazen, Byrd, 2012. Wu, et al. 2017. Liu, 2015. Healy, 2016. Bradford, 2018. Lee, et al. 2017. Oliveira, et al. 2014).

This study aims to summarize and rank the benefits that cloud computing adds to the most attractive and critical to customers, according to cloud supply management system providers.

STUDY METHODOLOGY

The study community is the cloud services providers, and has been allocated to provide cloud services in the field of supply chain management. The sample was selected by 50 companies

offering services in three countries namely Jordan, Saudi Arabia and the United Arab Emirates. These countries were selected to collect data. Most of the global companies in this field (SAP, Oracle, PeopleSoft, ...) have branches in these countries.

The study began by adding the advantages that cloud services add to supply chain management systems through previous studies and through publications published by vendors of such cloud applications. The researcher then prepared a questionnaire divided into two parts that summarizes the advantages and identifies them, because many studies and publications of companies of the similar advantages in content and different in terms and presentation, and the second part sought to arrange these benefits. The researcher sent the questionnaire via e-mail to the 50 companies and the response to the questionnaire had been received from 39 companies.

Characteristics of cloud supply chain management systems

1. Enhanced Collaboration

Cloud applications enhance collaboration by allowing diverse groups of people to effectively share information with the help of shared storage. Connect employees, vendors, partners and customers with accurate and real-time data. Cloud SCM systems enable you to integrate across the entire value chain. When everyone has access to safe and up-to-date information, they can collaborate better, make decisions with greater confidence, and improve efficiency. This ability helps improve customer service and product development as well as reduce marketing time. (Jun, Wei, 2011)

2. Scalability

This is one of the best features in today's volatile economic situation. Scalability allows organizations to grow or contract quickly and easily depending on the business needs available. Also, in the overall cloud, it is very easy to upgrade or reduce the infrastructure very quickly, making it an ideal platform for running high-performance and memory-intensive applications such as supply chain management systems and talent management applications, or staffing or performance management, requiring them to increase disk space, Memory, and even additional servers to accommodate growing workloads and users. (Korpela, et al. 2017)

3. Integrated development environment

When you move to cloud computing, all companies are even the smallest became more global. Collaboration with more staff and document partners has become common. Before the cloud, workers had to send files back and forth as e-mail attachments to work with one user at a time. So, it ends up with a clutter of conflicting file content, formats and titles. The cloud's integrated work environment connects supply chain members to provide the ability to make better decisions based on deep customer data, such as providing more relevant information to your customer base at the right time, or adapting to your customers' needs in real time. In 2020, almost all businesses will engage in integrated work environments that offer cloud-based desktop platforms such as G Suite and Microsoft Office 365 from Google for better support for group-based projects than traditional programs by allowing multiple users to work simultaneously, with reversing all changes in real time across an unlimited number of devices. (Schrödl, Turowski, 2011)

4. Improve ROI

With supply chain management systems and other cloud-based enterprise systems, customers can start working immediately upon signing a contract with the service provider, because

there is no front-end capital investment in software or hardware for partners and customers, resulting in a more cost-effective service and lower risk, where all the necessary infrastructure is always ready. The cloud provider will manage the platform operations to reduce the cost of deploying and developing cloud applications and providing best practices. All this helps to reduce time and effort in ROI. (Hazen, Byrd, 2012)

5. Operational Efficiency

The implementation of cloud supply management system applications greatly increases operational efficiency with better service levels, faster delivery times and simpler internal and external interactions, with service providers maintaining a 99.9% uptime. Workers can get essential applications from anywhere. This reduces the problem that most enterprises do not have the ability to monitor performance and respond to all incoming requests in a timely manner. When running in the cloud, tools are available to help you fully monitor requests and services. For this reason, there has been a significant increase in the overall operational efficiency of the Organization. Cloud systems also help to focus fully on strategic priorities and not worry about technical problems, resulting in increased productivity. You can take advantage of economies of scale when using a cloud service provider, allowing you to get more resources at a reduced cost. At the same time, your business can reach a global reach in its scope through this smart technology. So, you can reduce the time required to implement new resources, increasing the flexibility of your business in a competitive world. (Wu, et al. 2017)

6. Disaster recovery and backup solutions

The recovery of companies from disasters and uncontrolled events that may affect their data is very difficult if not enough investment is available in this area, but this issue remains for small companies that lack the funds and expertise required a major challenge, while there may be no way to prevent or even anticipate disasters that can harm the enterprise, so the cloud now helps more enterprises to achieve this trend. Small and medium-sized enterprises have doubled their number of cloud-based backup and recovery solutions. Cloud backup solutions play a key part of a comprehensive backup, recovery and business continuity strategy. When all data is stored in the cloud, backing up and restoring it is relatively easier than storing it on a physical machine. Cloud Backup provides an easier and less resource-consuming way to protect your data. Most cloud providers distribute backups between data centers in different countries to ensure reliable access at all times. Most also provide an efficient data recovery service. (Liu, 2015)

7. Cost Efficiency

Cost is clearly one of the driving factors in moving your applications to the cloud because it saves you money in the long term. Moving to the cloud system reduces the costs of managing and maintaining your IT systems. Rather than buying IT systems and equipment and running data centers and servers. Cloud computing has revolutionized how companies access IT services, infrastructure and software by eliminating or reducing the need for capital investment (for example, in multiple software licenses) and allowing companies to get what they need when they need with the possibility of expansion and contraction at any time without the need to provide infrastructure or dispense servers and staff. (Healy, 2016)

8. Enterprise security

Knowing that security is one of the biggest reasons for cloud adoption, cloud computing offers great security when you lose sensitive data. When your data is stored in the cloud, you

can access it no matter what happens to your device. You can also wipe data remotely from lost or stolen laptops, so it will not be used by wrong hands. The time spent by the cloud host is also carefully monitored, and is remarkably more efficient than the traditional rules of procedure. Although most companies do not want to explicitly consider the possibility of internal data theft, the fact is that a high percentage of data theft occurs internally and is committed by employees. When this is the case, it can be safer to keep the sensitive information out of the site. Cloud providers also perform more regular security checks than they may do on the local server. (Bradford, 2018)

9. Easy Access to Information

The next key feature for using cloud systems is easy access to information. Cloud provides customers with full administrative access to information once users are in the cloud. They can access information from anywhere, with an Internet connection. This feature allows users to navigate beyond the time zone and location issues. Customers who deploy the Cloud environment also have the same control, security, and functionality as they do with their internal environment. (Lee, et al. 2017)

Cloud-based technology is not only limited to the possibilities offered by computers, this special feature of cloud computing makes it a better choice if employees are looking for remote facilities or if you want to provide greater flexibility and balance your work and life. Fasteners provide a great platform for analytics and data reporting, and allows users to get rich insights about their business. Users can transfer data that is not frequently accessed from memory to a data warehouse to provide more cost-effective. (Cloud Standards Customer Council, 2017)

10. Support (Automatic Updates and compliance)

Applying cloud applications ensures application compatibility, infrastructure, security mechanisms and processes. This saves time and money without having to create these very important factors on your own. Over the past years, cloud providers have provided a number of certified professionals and business partners who can provide managed services around the clock to regularly update applications including security updates, providing additional time to focus on important things like "how to grow your business Cloud systems also deal with data security, operations and control, a compliance requirement that provides a safer infrastructure that can help diagnose and respond to any problems that arise. (International Data Group (IDG), 2017)

11. Multiple options

Companies have different requirements when choosing systems, so cloud service providers offer flexibility in choice. Companies can customize the environment for their workload in the cloud through different calculation options, and most cloud service providers provide the main cloud services clusters, IaaS, PaaS, and SaaS. All this enables you to choose the best strategy as per customer mode, each type of service offers unique facilities which will certainly benefit any requirements for storing data that may be for the subscribers without excessive costs. (Oliveira, et al. 2014)

After summarizing the features added by the cloud management of supply chain management described above, a table showing the sample response will be presented to prioritize the advantages of cloud supply management system providers. These features are presented on the sample and ordered to rank as important.

Table 1. Showing the sample response

Benefits	Average sample responses
1. Cost Efficiency	%92
2. Support (Automatic Updates and compliance)	%68
3. Scalability	%71
4. Integrated development environment	%63
5. Enterprise security	%83
6. Enhanced Collaboration	%71
7. Improve ROI	%82
8. Disaster recovery and backup solutions	%59
9. multiple options	%77
10. Easy Access to Information	%84
11. Operational Efficiency	%61

The calculation of the mean of the sample responses was determined, and the table above illustrates the ranking obtained by the study.

CONCLUSION AND RECOMMENDATIONS

There is a whole range of reasons why cloud computing brings advantages to supply chains, as this article reveals. There are many advantages of cloud computing, but in this study these benefits are summarized in eleven (11) advantages that cloud computing adds to the supply chain management systems:

Cost Efficiency, Support (Automatic Updates and Compliance), Scalability, Integrated development environment, Enterprise security, Enhanced Collaboration, Improve ROI, Disaster recovery and backup solutions, multiple options, Easy Access to Information, Operational Efficiency.

These features are also ranked as important from the point of view of cloud service providers. The researcher recommends expanding the scope of this study until a benchmark is established for this study. The researcher also recommends expanding the study to include customer opinions in these features to prove the credibility of the service providers.

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