

# MIGRATION OF CLOUD ERP INTO E-COMMERCE

M.N.Nachappa<sup>1</sup>, A. M. Bojamma<sup>2</sup>, M.N.Varun Somanna<sup>3</sup>

<sup>1</sup>Associate Professor, Department Of Computer Science, St. Joseph's College (Autonomous),

<sup>2</sup>Assistant Professor, Department Of Computer Science, St. Joseph's College (Autonomous),

<sup>3</sup>Scholar, Department Of Computer Science, St. Joseph's College (Autonomous),  
Langford Road, Shanthinagar, Bangalore – 560027, India.

## Abstract:

E-commerce has been successful in implementing cloud computing in their websites, but there are problems faced by much small and medium E-commerce business when compared to a large industry i.e. in terms of maintaining customer relationship management (CRM), changing technology, changing employees, supplies and the expectation of their organization's partner. The introduction of an ERP system into this E-commerce business did bring a change in maintaining the flexibility of their business process but these ERP systems alone face a lot of risks. This paper provides a framework of how the E-commerce business has been influenced by cloud computing and it also includes the implementation of a cloud ERP into small, medium and large business and how this technology has in a way improved the quality of the E-commerce business.

**Keywords** — Customer Relationship Management (CRM), Cloud ERP, Framework

## I INTRODUCTION

E-commerce enterprises provide an international marketplace for its businesses. With the E-commerce applications, the enterprises provide access to its users worldwide.

Ecommerce enterprises strive to maintain their customer relationship management (CRM) and maintaining the updating of their technology. E-commerce in small and medium enterprises face challenges in their day-to-day operations like security, cost implementation and cost saving. In order to overcome these issues most e-commerce websites have moved into the cloud. E-commerce enterprises like Amazon, e-bay etc. Cloud computing these enterprises with a reliable infrastructure, it ensures the high performance of their services and it also ensures cost-saving of the enterprise. For example- Amazon Web services enables users to store their data through its **Storage Service(S3)** and performs computations by

using the service **Elastic Cloud Compute(EC2)**.

Cloud computing can ensure the benefits of both the vendor and the user. The implementation of the cloud ERP model many business industry have overcome the pressure of maintaining their profits, changing supplies and understanding the perspective of their customers. Cloud ERP provides a platform for many businesses over the internet and the same can also be applied to many small, medium and large enterprises. Most ERP system developers are moving their system into the cloud in order to provide a more dynamic module to many business industries.

This paper includes a framework about the implementation of cloud ERP into small, medium and large size E-commerce industries and how the features of cloud computing can enhance their enterprises.

## II INFLUENCES OF CLOUD COMPUTING ON E-COMMERCE INDUSTRY CHAIN STRUCTURE

The E-commerce industry comprises of the hardware supplier, software developer, system integrating provider, internet service provider and its customers and enterprises. The backend is supported by the hardware supplier, software developer, system integrating provider and internet service provider.

When cloud computing was moved into E-commerce all the necessary products and services were given to the E-commerce website by the cloud service provider. This is an advantage to the E-commerce enterprise as it can rent the cloud services needed rather than purchasing them. The cloud service provider serves to be the backend which offers the necessary infrastructure services for the cloud service provider

## III IMPACT OF ERP SYSTEM ON BUSINESS ENTERPRISES

The Enterprise Resource Planning (ERP) system was first evolved in the year 1990 but at that point of time it was known to manage only inventory control, but now this ERP system manages and centers on business including manufacturing, marketing and sales, thus ERP is a business software system that enables an organization to use and manage resources effectively.

ERP system also improvises the functionalities of an organization or a business firm overnight. The overall expectation of achieving high cost savings and services depends on how good the quality of the ERP system fits into the functionalities taken up by the organization and how well the ERP system configuration matches up to the culture of business, business strategies etc. The business data that is managed by the ERP system is stored in a central database. ERP software is

dependent on the Software platform, Databases, Intelligence, high security and any other third party software

The entire concept of ERP is summarized in the figure 1 given below.

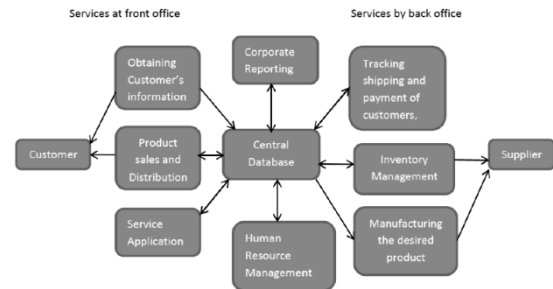


Figure 1: ERP system

## IV CLOUD ERP SYSTEM

Cloud ERP is framed and utilizes its services via a cloud provider. Cloud ERP helps in overcoming the rigidity of the existing ERP system. IT allows the organization to program their ERP system that fits their needs. Cloud ERP is adaptable in many small and medium size enterprises (SME) and it allows them a chance of having high profits. The implementation of an on-premise ERP system would require high expenses in terms of software, hardware, advisor, training, implementation and maintaining of their expenses would in turn cause diminishment to the cost of the organization's IT framework or the cost of its infrastructure.

Cloud computing provided software as a service (SaaS) to the existing ERP system, cloud computing provides more versatility and its pay-as-use service lessens the equipment cost. There are many ways of implementing a cloud ERP, one such way is by outsourcing i.e. by outsourcing the hardware and software they are given by companies outside the organization which enables the organization to utilize their resources for rent and these organizations upholds and manages these resources. Organization can use VPN (Virtual Provider

Network) connection via the internet and another way is accessing services provided by the cloud providers. In the corporate sector, there are two types of cloud ERP, one is ERP software system consists of accumulation of services within the SaaS platform and because it provides the benefit of a low investment cost many small and medium enterprises can utilize this facility. On the other hand, we need to think about the cut-off points of these services. It means an organization may not need all the resources but only a few that are necessary to them so they are to go for a BPR (Business Process Re-engineering) by utilizing these services and principles that guarantee their process flow and the match of their ERP structure.

#### **V PROBLEM DEFINITION**

E-commerce enterprises face a lot of challenges in retaining their old customers and also gaining new customers, they require a high customer attractive interface, internet service providers for hosting their website onto the web and they invest huge amount of money in purchasing hardware and software resources. In addition to this many small and medium size E-commerce enterprises have to cope up to the challenges of cost and security effectiveness, so by introducing cloud computing into E-commerce enterprise it enable the organization to run their business effectively and by introducing cloud ERP model into the small and medium size business they

will be able to tackle the problem of customer demands, supplies and maintaining their resources.

#### **VI IMPLEMENTATION**

##### **a. Migration of cloud computing into E-commerce SME's**

Most E-commerce SME's may not be well developed in terms of their resources and also in view of their financial perspective. Cloud computing allows them to rent these resources at a lower cost; they only need to pay for what they utilize. In addition to this cloud computing

Also provides security in maintaining the confidentiality of the customer's phone no. , credit card-no, address etc. which is collected electronically by SME's.

##### **b. Introducing cloud ERP into E-commerce SME's and large Enterprises**

The movement of the on-premise ERP system into the cloud allows the E-commerce enterprises in understanding the customer behavior and expectations and thereby plans their products and services accordingly. It also tackles the challenge of employing a wide variety of expertise and skills in planning the future trends of their business. Cloud ERP provides the organization with the necessary resources and allows the organizations to take appropriate decisions.

##### **c. Cloud computing deployment models**

The cloud computing deployment models includes public cloud, private cloud, hybrid cloud and community cloud. The public cloud provides shared resources and services online to the E-commerce websites but the negative aspect of this is that it gives least importance in maintaining the security within the cloud. The private cloud is built and solely used by one particular organization; it is concerned about maintaining the security and confidentiality of the organization without sharing the resources with other organizations and by using its own databases. The hybrid cloud is a combination of the public and private cloud an organization which rents its resources from another company can deploy this model most enterprises use this model. The community cloud is one such deployment model which can be shared among organizations with a common perspective, the management of the cloud and its services are handled by a third party and it is made available to various organizations. In the framework included in this research paper it shows as to how the cloud ERP has access to these deployment models in serving the E-commerce enterprise.

**d. Building of the Main Framework of migrating Cloud ERP into E-commerce enterprises**

As of now Cloud ERP has not been introduced into the E-commerce enterprise but this paper focuses on introducing it into E-commerce SME's many large enterprises can utilize this facility. Initially, most enterprises focused on on-Premise ERP systems which has a few drawbacks of its own hence this ERP system availed the facility of moving into the cloud.



**Figure-2 Main Framework of migrating Cloud ERP**

The above framework shows as to how the cloud ERP can be applied by E-commerce SME's as well as large enterprises. At level 1, it depicts the stage of introducing cloud computing into E-commerce enterprises, the services to these enterprises are provided by a third party provider especially to SME's a large enterprise could afford to have its own cloud provider eg. Amazon, E-bay etc. The various components that supports cloud computing include

- **IT service provider-** which determines as to what kind of services is desirable to an organization for which the organization is recommended to consult the respective service provider
- **System Integration Provider-** This provides the required configuration that is needed by a system being utilized by an organization.
- **Hardware Suppliers-** The organizations are provided with the operating systems, memory, processors, databases and also with

applications that are related to some user tasks.

- **Internet Service Provider-** A good internet connection is required in order support cloud computing this task is taken care of by the Internet Service Provider and these services are to the cloud via a computer network.
- **Software Developer-** An E-commerce enterprise requires to own software and it is necessary for it to have its own database. The software is designed, developed and delivered over the cloud.

The components are the basic components required to enable cloud computing and once completed they deliver their services to the enterprises via the cloud. The organization's that utilize these services pay only for what they use.

E-commerce SME's and large enterprises have been exposed to ERP systems. However, with the era of cloud computing many SME's can opt for cloud ERP, this can be seen at level 2.

At level 3, we can see that the cloud ERP can be operated via the cloud deployment models i.e. through the public cloud, private cloud and hybrid cloud. The public cloud provides low security and low cost whereas, the private cloud provides high security and is comparatively expensive than the public cloud. The hybrid cloud provides medium security and medium cost. Organization can choose as to which deployment model they can use to run their cloud ERP ascertaining to their security and affordability to run the cloud environment.

These services are thereby delivered into PaaS(Platform as a service), IaaS(Infrastructure as a service) and SaaS(Software as a service). SaaS

concentrates on the software delivery which is provided by the cloud service provider and it is cost-effective. PaaS provides the operating systems, databases or an application environment to develop software as for the ERP system it aims to provide resources that supports the ERP system. IaaS provides services such as storage, servers, routing, switching here the users are allowed to own and buy the required infrastructure.

Once when the services are ready the product that is obtained is delivered to the customer as per their requirement. The cloud ERP can be used by enterprises that are financially backward and help in reducing their expenditure on IT. Most developing countries are moving into this technology.

## **VII BENEFITS OF USING CLOUD ERP IN E-COMMERCE ENTERPRISES**

- It allows organizations to run their business effectively rather than relying on expertise and skills of the employees
- It helps organizations in initializing better customer relationship management and understanding the demands of the customer.
- Cloud ERP allows different branches of the organizations to access the same cloud through the web.
- Cloud ERP is more flexible and scalable compared to the on-premise system which requires updating of software and the necessary hardware each time.

## **VIII CHALLENGES AND PROMISES OF CLOUD ERP**

### **1. PROMISES**

- **Reduction of cost:** The usage of cloud ERP is very essential especially to small and medium

enterprises as it will avoid their expenditure on purchasing their hardware, software and other IT resources. Instead, these requirements can be rented by the enterprise. In case of large enterprises, they may require servers, high storage area and also maintenance of their database is quite tedious cloud ERP tackles these issues providing them with a pay-per-use service and helps in running their enterprise effectively. Cloud ERP also handles the risk of damage that may be caused to the hardware or infrastructure than with that of on-premise ERP technology.

- **Period of implementation is short:** Cloud computing does not require any physical setting up of IT infrastructure this is taken care by the cloud service provider. Hence, the implementation is short and fast and all the required services are easily accessed via the cloud. Cloud ERP comes together as a package with good quality than the on-premise ERP. The implementation of the cloud ERP takes only about 3-6 months compared to the on-premise ERP which takes about 1-3 years to implement their system.
- **It can be easily accessed anywhere:** Through the use of cloud computing it can be accessed anywhere provided the internet connection is good. It can use any device such as smart phones, PC's etc. A travelling businessman or a sales person delivering
- The product to the customer can make use of this facility to update the database and the organization can keep a track of the updates.
- **On demand IT services:** The services of Cloud ERP are provided

as per the needs and requirements of an enterprise. Most importantly it provides three vital dimensions cost, resource and quality and this together is collected as a package of a resource pool. It takes about a month, year or so depending on the need of the client to deliver the product.

- **Helps in better decision making:** The customer's data is transformed into useful information and provides knowledge which helps in understanding their mindsets and this is will in turn help organizations in better decision making and claiming their products.

## 2. CHALLENGES

- **Cloud ERP software may not be customized:** As the software design and development is being handled by the service provider there is a chance of the product not meeting the needs of the clients. The enterprise may require a separate module for billing and storing the data of the customer's payment method, the idea of this may not strike the mind of the developer. On the other hand, there may exist many unwanted interfaces or a large storage space not pertaining to the criteria of the enterprise so this could result in wastage of time and money.
- **Strict cloud environment may cause impairment while integrating:** An E-commerce enterprise, they may be having their branches distributed across various countries or cities and each branch may own their service provider and sometimes a few branches may want to keep their data confidential for which they may use a specific cloud deployment model so in such cases integrating the data of the

organization becomes very difficult and also they might face an issue while changing their software in terms of designing a new interface or in changing the backend software etc.

- **Performance can be unstable:** An E-commerce enterprise must be cautious in choosing the right service provider. The factors such as speed, availability, reliability, scalability, time and cost should be taken into consideration. If these services fail, the enterprises may fear losing their customers and also the profits of their business will go down. The different distributed branches may be functioning differently and the kind of service which is being delivered may vary from one branch to the other.

#### **IX IMPROVIZATION NEEDED ON CLOUD ERP**

- **Efficiency:** Before delivering the product, the E-commerce enterprise should mention what they essentially need or they can take guidance of the developer on how to improvise their website or what would suit them better so when such requirements are clear, it would satisfy the client and it would also help the developer or the service provider in not pertaining to unwanted elements of the enterprise.
- **Flexibility:** Once an ERP system is embedded into the cloud it becomes very difficult for the organization to have a control over the cloud. As mentioned previously, it is better to describe the requirements before moving into the actual development. There has not been any such algorithm of holding a control over the cloud as the services are delivered over the internet.

- **Security:** The enterprises should be cautious in deciding their cloud deployment models. If they feel that their data should be kept confidential then it is good enough if they move to the private cloud and if an organization feels that their data need not be kept confidential then they can use a public cloud. A cloud ERP can include these deployment models in their package while delivering to the client.
- **Reliability:** A cloud ERP should be consistent in delivering their services. E-commerce enterprises utilizing cloud ERP should look forward to improve their services to their customers or if they are successful enough they should work consistently on the same ground. For example: Amazon has been successful in their business when compared to home shop because they continuously keep track of their customers and readily making the product available and also through their usage of the Amazon Web Services it improved their organization by providing a better quality website to run their business online.

#### **X CONCLUSION**

As of the current criteria, no research as focused on moving e-commerce enterprises into cloud ERP, although they have concentrated on the on-premise ERP systems. This paper has shown as to how the cloud ERP can be utilized by E-commerce SME's. By moving into the cloud many organizations have been successful like Amazon, E-bay etc. Though cloud ERP or cloud computing may have its own pros and cons, organizations should be suggested to move their business into the cloud.

By making use of the cloud ERP into many small SME's, they can compute the

customers' needs which changes over time. Moreover, the cloud ERP model comes as a package so the enterprise need not make a huge investment in their project. It is essential in the field of marketing, payment and shipping of the products to the customers. It is tangible and the best way to provide high computational power to many E-commerce SME's.

10. FengzeZhong and Dr. Max Erik Rohde, "Cloud computing and ERP: A framework of promises and challenges"

## **XI REFERENCES**

1. Chunling Sun, "Research of E-commerce based on cloud computing"
2. Samer Jamal Abdulkader and Abdallah Mohammad Abualkishik, "Cloud computing and E-commerce in small and medium enterprises(SME's), benefits and challenges".
3. S.L. Saini, Dinesh Kumar Saini, Jabar H, Yousif and Sandhya V. Khandage, "Cloud computing and Enterprise resource planning system"
4. Tairan Liu, "E-commerce Application Model based on cloud computing"
5. C.LakshmiDevasena, "Impact study of cloud computing on business development"
6. Christina Albert Rayed Assad, "Building a cloud ERP framework for modern business in developing countries"
7. Gurpreet Singh, Manpreetsingh Manna and Gurpreet Singh, "A study of impact of ERP and cloud computing in business enterprise"
8. Anukriti Singh, ShrutiNagpal, "Implementation of ERP in cloud ERP"
9. Danping Wang, "Influences of cloud computing on E-commerce business industry"