

Implementation Of ERP In Cloud Computing

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Abstract: We have been using ERP since decade but it never got so much attention which it got with cloud computing. In this paper we will be discussing and analyzing the issues concerning with the execution of Enterprise Resource Planning in cloud computing. As a lot of the researches concentrates on one of the topic and few of them have taken both as a study. In this paper I will be discussing implementation of Enterprise Resource Planning in Cloud Computing. In this I have covered diverse aspects of both ERP and Cloud Computing and after studying their major advantages and disadvantages I have suggested few recommendations.

Index Terms: Enterprise Resource Planning, Cloud Computing, ERP, Cloud ERP, Cloud Computing Security, Small and medium size enterprise (SME).

1 Introduction

Enterprise Resource Planning is a business organization programming for the most part a suite of composed procurements that an association can use to store and direct data from each one period of business including manufacturing, marketing and sales, inventory management, shipping and payment, product planning cost and development. "ERP is a packaged business software system that enables one to manage the efficient and effective use of resources by providing a total integrated solution for the organization's information processing needs."^[1] For past many years we have been using ERP and many Researches have been done on it and all concludes that the existence of such system helps an organization achieve greater efficiency and profitability. ERP was evolved in late 1990 as before in 1960, the existence software in organization was only used for inventory control then after this in 1970's, MRP (Material Resource Planning) system were introduced which focused on marketing and product manufacturing planning for production and inventory orders .In 1980, the quality and capacity planning was considered in MRP II systems and MRP II+ has provided products and service based on customer's demand. ERP framework at first centered around back office capacities which did not specifically influence clients and front office capacities, for example, Customer Relationship Management (CRM) which managed straightforwardly with clients, Supply Chain Management.

2 CLOUD COMPUTING

Cloud computing is a computing technology that involves variety of computer connected for delivering computing services through a communication network such as internet. Many companies provide these kinds of services such as Amazon, Apple, Google, Sales force and Microsoft Azure.etc., all of them are cloud Vendors. Cloud Computing is not another idea in information Technology, indeed it is a more exceptional variant of data processing administration authorities that we had 40 Years back.

Cloud Computing comes with a package of specification. It is beneficial for all sizes of business and is very economical. It offers so much of advantages that everyone likes to use it. It provides flexibility, better reliability, security, portability, collaboration, unlimited storage, unlimited file access and many more. But there are some issues relating to Cloud Computing which it is facing are preserving confidentiality and integrity of data in aiding data security and these problems do have a solution that is data encryption in Cloud which again have its own problems. But above all these issues Cloud Computing has so many applications which helps in reducing IT costs and help in increasing business capabilities.

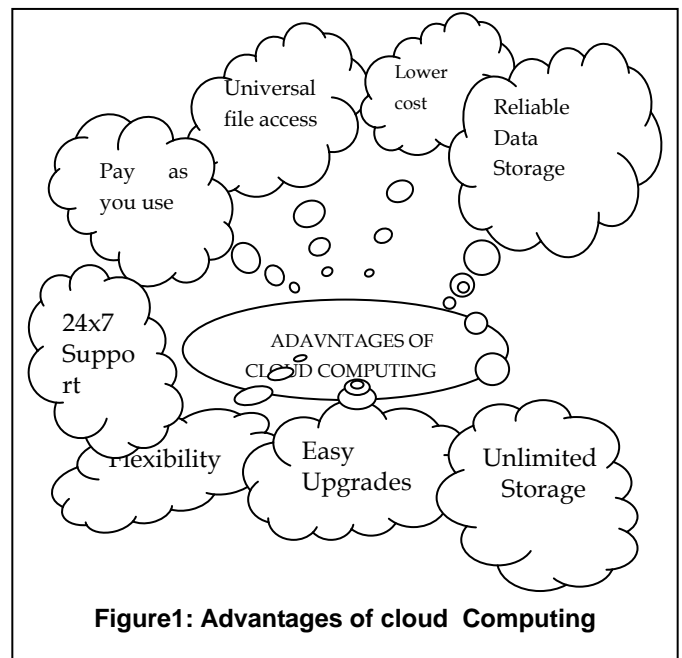


Figure1: Advantages of cloud Computing

Cloud Computing is not only a technology it's an approach that tackles the force of servers by dividing the single servers into various virtual machines and there are numerous sorts of organization models accessible for executing Cloud Computing. There are four sorts of cloud models: Public, Private, Hybrid and Community. In Public model which are available for open use for the public by a particular organization who also hosted the service or we can say, it is accessible for the general public by supplier who has the cloud base. Then there is a Private model which is used by a particular organization and allows businesses to host applicant in cloud so that there is better data security and control which makes it more trustworthy than Public model. It could be

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facilitated (inside the organization) or remotely (utilized by one organization, however are facilitated by a third gathering spend significant time in cloud infrastructure). Whereas, Hybrid models are the arrangement of two or more clouds (private, open or community) that stay extraordinary however bound together, offering the best of numerous deployment models which is inside and remotely facilitated and are advantageous. Then there is Community model which are shared by several organizations, they are externally hosted, but can be internally hosted by one of the organization. Cloud services are provided in three ways:

- IaaS (Infrastructure as a service)
- PaaS (Platform as a service)
- SaaS (Software as a service)

In Infrastructure as a Service, customers purchase only needed infrastructure there is no compulsion for them to buy the whole model for their little use. In this you only pay for those parts you needed the most. As mentioned in Figure 1 pay-as-you-use. This benefits the buyer as they don't have to pay lump sum amount. The Amazon E2 is an example of this service.

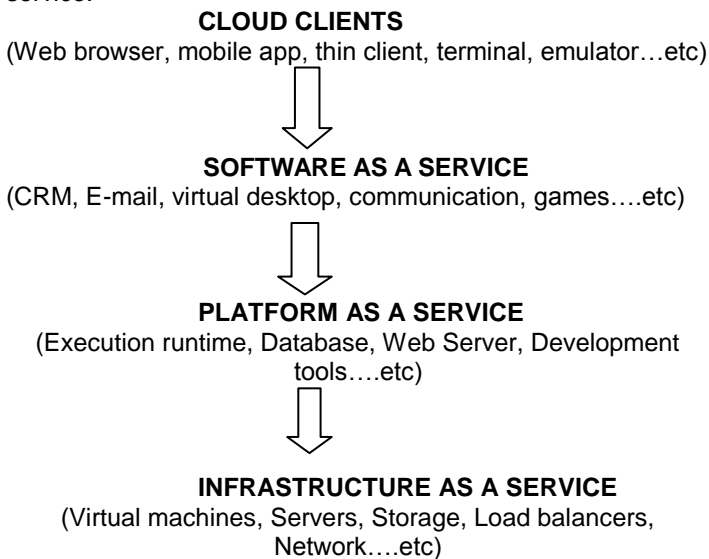


Figure 2: Cloud services ^[2]

3 CLOUD ERP

Cloud ERP is intended to address the rigidity of existing ERP programming by permitting organizations to pick the organization choice that fits their particular needs. Cloud ERP is an adaptable and financially beneficial choice for little and medium-estimated organizations and offers far reaching profits for development and extension. Cloud ERP is facilitated ERP on a cloud provider. Now the question arises:

WHY CLOUD ERP?

WHAT IS THE USE OF CLOUD ERP?

IS IT IMPORTANT TO HAVE CLOUD ERP?

One can never satisfy the WHY? But before answering any of these questions we should know what the expense of ERP implementation is, does these expenses incorporate software, hardware, advisor, training, implementation and maintaining

The decrease of these expenses relies upon the diminishment of organization's IT frameworks costs or infrastructures cost. These frameworks include software, hardware, storage, network and other frameworks. We can outsource hardware's and software's. Outsourcing is a deposit of control, supporting and giving IT frameworks needs by some organization outside of an organization. Some of its frameworks are Software including applications, Management, Services and hardware including computing power, Storage, Backup and Networks. So for the study what we have come across is that Cloud ERP is not important but if someone is looking for a beneficial deal here it is. As Cloud based ERP profits clients by giving provision versatility and lessened equipment costs. Also, Cloud Computing technology made it simpler for cloud ERP based sites to convey our ERP programming as Software as a Service (SaaS) for clients who need to procure cloud ERP and not need to oversee equipment, programming, and redesigns while lessening in advance expenditures. Clients can assemble an internal cloud to decrease continuous equipment expenses while supporting more amazing control over coordination or integration and by getting access to their data server. If this thing has so many benefits then why not one can use it and save some money and invest in some needed place. There are many ways one can have Cloud ERP, as one we have discussed above i.e., outsourcing. In outsourcing the hardware and software are given by companies outside of an organization and these organizations do all works about upholding and management. Organizations can get to these services by utilizing committed line gave by telecommunication organizations or utilizing VPN (Virtual Private Network) connection over the internet. Another way is utilizing services that are given by Cloud providers. Cloud ERP is simply an ERP given by Cloud suppliers. In corporate world, we have two sorts of Cloud ERP, in the initial one, ERP software is exhibited as an accumulation of services in the SaaS term. These services are called ERP on SaaS, and because of the low investment cost in the service, SME's that doesn't have much to invest can use the benefits of ERP on SaaS. On the other hand, we ought to think about the cut off points of this sort of services. In this sort of usage, organizations are confronted with limitation on business process re-engineering in organization and customization of ERP. It is exceptionally prescribed to do BPR (Business process Re-engineering) by utilizing service suppliers experience and principles to guarantee the organization process flow and ERP structure match. Besides, on the grounds that suppliers have entry to all authoritative information, we are confronted with security and protection issues. Some of these issues incorporate notoriety destiny imparting i.e., reputation fate sharing, access to data for a few issues like authorization and debacles. By this we can overlook the exceptionally prescribed profits of such services and further we suggest a few parameters for organization to help them pick what sort of services they can pick relying upon their points of confinement and obligations. Around a few organizations that give these services we can name SAP by design, PLEXONLINE, Sale force, Infor and NETSUITE. There are many ways to implement cloud ERP in which there is a method where ERP is implemented on IaaS offered by Cloud service providers. In this circumstance, such service could be placed topographically inside an organization or set up at that place where implementer or supplier is hosted. But it has its own pros and cons like if we placed it inside the organization then they will have high security and

accessibility yet then again, the organization is confronted with high expense of implementation and maintenance. In this type of situation where the organization or Enterprise needs high security as they have so many branches to connect, then this is really effective. Whereas there is another way in which ERP is hosted by the providers, we acknowledge security concern to decrease the execution costs or implementation cost. In both ways, in light of the fact that of utilizing IaaS, ERP license ought to be purchased by the organization and implemented by implementers, so that customization and adaptability will be increased. In most organizations that give this kind of services, ERP additionally will be given.

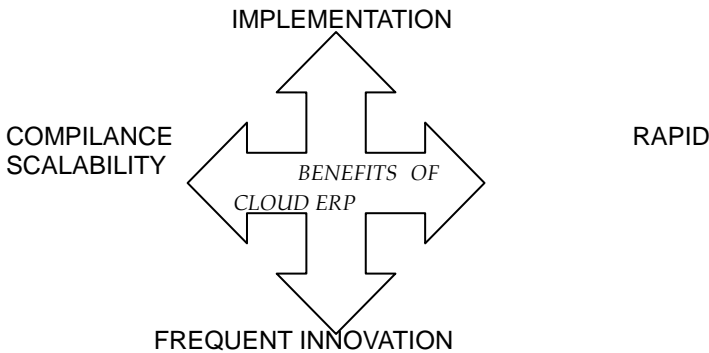


FIGURE 3: BENEFITS OF CLOUD ERP

4 RESULT AND DECISION:

Enterprise Resource Planning (ERP) systems can spare organizations a considerable measure of time and cash, in addition to different profits and likewise Cloud computing projects can additionally be cost-effective and have been found to improve specialist resolve and profit. Accordingly, standard way of thinking proposes that cloud-based ERP implementation can profit organization in a many of ways, as in figure 3 there are some benefits of Cloud ERP in which there is a frequent innovation where one can have the new features without even upgrading it. Then there is rapid implementation as with a focus on configuration and integration one can have the implementation done in weeks. Then there comes scalability where one can add users for growth and can lessen the users in tough times and can expand into new markets and new geographic with confidence. Yet individuals after this whole still gets confused between on-premise ERP and Cloud ERP as off and on again it is hard for the organization to take a decision in some situation which to execute as on-premise ERP might be introduced commonly on organization's hardware and servers and might be overseen by the organization IT staff yet it obliges expansive upfront and ongoing financing and deal with the software and the related hardware, servers, and offices important to run it.. To make the comparison simpler here is a figure 4 showing the difference between On-premise ERP and Cloud ERP.

Cloud ERP

- Cloud ERP supplier has to keep up the whole IT infrastructure for you.
- Suppliers guarantee that the framework is continually running, that the data is secure, and that item improvements are taken off easily to your solution without breaking your beforehand executed customizations.
- cloud ERP suppliers permit your IT assets to concentrate on improving and helping develop the business all the more viably, as opposed to using a disproportionate measure of their time on keeping up and dealing with your on-premise framework.

On-Premise ERP

- Requires experienced IT staff and if companies don't have it then they have to spend on it.
- It obliges that organization's IT group use a lot of their time and plan guaranteeing your framework is up-and-running when you require it, including support of hardware, server rooms, and more.
- Whenever is the ideal time for organization's ERP framework to be updated, IT should then redeploy the framework over the different clients' workstations and re-actualize different customizations and integrations that your business introduced on your past software.

Figure 4: Comparison between On-premise ERP and Cloud ERP

In this research paper my main concern is to show the brighter side of the Implementation of ERP on Cloud Computing but there are some problems with Cloud computing which I have discussed above i.e., data availability or business continuity, security and privacy issues but if we keep this thing aside and look for the benefits we do have plenty of advantages which has given an Enterprise and organization a new way of doing things in lesser time and amount. There are some obstacles which are found with the implementation of Cloud ERP which includes the connection costs for both network and internet and lack in appropriate data security for cloud computing but again Small and medium size organization have problems using ERP so they can switch to Cloud ERP.

RISK FACTOR	TRADITIONAL ERP	CLOUD ERP
Data Availability	LOW	HIGH
Data confidentiality	LOW	HIGH
Web security issues	LOW	HIGH
Privacy	LOW	HIGH
Privileged user access	LOW	HIGH
Data location	LOW	HIGH
Recovery	HIGH	LOW
Long term viability	HIGH	LOW
Unknown risk profile	LOW	HIGH

Figure 5: Risk Factor in Traditional ERP and Cloud ERP ^[3]

As figure 5 has shown the risk factor include in both traditional ERP and Cloud ERP .One can use traditional ERP if they have very important data that are needed for business continuity or for those Enterprise which are established on a large scale and can bear hefty amount for the implementation of ERP and for Small or Medium size enterprise Cloud ERP is the best option to be implement as they can use the ERP on laas which will be very cost effective but will come with lesser security issues.

5 CONCLUSION:

Implementation of ERP in Cloud Computing has solved many problems of many companies as ERP and Cloud Computing both contains many advantages and little disadvantage too but when there is a mix of two good things it leads to get better in time as discussed above ERP helps an organization accomplish more excellent productivity and benefit as it is a facilitated provision that an organization can use to store and supervise information from each one period of business including manufacturing, marketing and sales, inventory management, shipping and payment, product planning cost and development whereas Cloud Computing provides flexibility, better reliability, security, portability, collaboration, unlimited storage, unlimited file access and many more. Cloud ERP is nothing more than a ERP hosted on a cloud by cloud providers Cloud ERP is an adaptable and financially beneficial choice for small and medium-estimated organizations and offers far reaching profits for development and extension. If we don't see the obstacles in it then it is the best way to save money and time and really helpful for the organization to have what they needed 24x7 by paying only for that they require and can have scalability with reliable data storage.

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