

Adopting Cloud ERP in Small and Medium Enterprises: Benefits and Challenges

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Abstract:- As wide-ranging of IT services transfer to online services in the cloud, progressively many IT managers are thinking whether to move their enterprise resource planning (ERP) systems there also. Small to Medium Enterprises of India are one of the most hostile implementers of ERP solutions. Most of the SMEs have implemented the traditional ERP Systems and have incurred a heavy cost while adopting these systems. Even though some SMEs have prospered in shifting a portion of their unconventional ERP services, for example human resources systems, into the cloud, many organizations keep on vague of undertaking the same with core supply chain and financial operations. There are a many aspects that organizations should consider in determining whether and how to use cloud-based services for their ERP systems. Industry type, company size, solution complexity, security needs, and several other organizational issues must all be addressed. In this Perspective, this paper presents the various cloud deployment and delivery models, ERP deployment models, benefits of implementing a Cloud ERP solution from scratch or a migration from an existing in-house solution to a cloud version, and challenges of moving ERP services to the cloud.

Keywords: Cloud Computing, SME, ERP, SaaS, Cloud ERP

I. Introduction

Globally, industry is changing very fast in terms of ERP systems and they need very specialized solutions. Business problems are very complex and need more money and efforts. There is a continuous requirement to boost the productivity of everyday jobs. The ERP solutions are evolving to address these emerging requirements of all SMEs. ERP systems are unified software suites with a shared database that support business processes in organizations irrespective of its size. They contain different functional components that reflect the departmental structure of an organization (inventory, trades, production, store, accounting etc.) The use of ERP has reformed drastically over a period of few years. At present ERP can be used to any enterprise operating in any kind of business.[2]

Cloud Computing Deployment Models

According to National Institute of Standards and technology (NIST), Cloud computing is a model for supporting ubiquitous, suitable, on-demand network access to a shared pool of configurable computing resources that can be quickly provisioned and released with minimum management effort or service provider interaction. Cloud computing services are categorized as public, private, community and hybrid cloud.

Private cloud: In private clouds the cloud computing infrastructure is provisioned for private use by an organization

consists of many users. Generally it may be owned, managed, and operated by the organization, a third party, or both, and it may be present on or off sites. Private clouds are treated as more secure than public clouds as their users are trusted users inside the organization.

Public Cloud: The cloud infrastructure is provisioned for open use to the general public over the Internet. It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. It exists on the locations of the cloud provider. Many popular cloud services are public including Google App Engine, Salesforce.com and Amazon EC2.

Community clouds: The cloud infrastructure is provisioned for exclusive use by a particular community of users from organizations that have shared concerns. It may be owned, managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and it may exist on or off premises.

Hybrid cloud: The cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds).

Cloud Delivery Models

A cloud delivery model describes a specific, pre-packaged grouping of IT resources presented by a cloud service provider. There are three cloud service models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). With each cloud service model, certain tasks are moved to the cloud provider permitting users of cloud services to emphasis more on their own business necessities and less on the primary technologies.

Infrastructure as a Service (IaaS) abstracts the essential infrastructure and data centre capabilities so that users no longer have to rack and stack hardware, power and cool data centers, and buy hardware. Computer resources can be provisioned on demand as a utility.

Platform as a Service (PaaS) takes users one level superior in the stack and abstracts that OS, application server, programming language and databases. Users using PaaS can concentrate on developing application on top of the platform and no need to concern about setup, manage, and patch operating systems. PaaS also takes care of scaling, failover, and many other technical design considerations so that developers can focus on business applications and less on the underlying IT infrastructure.

SaaS is an absolute level of abstraction. With SaaS, the complete application or service is supplied over the Internet using web browser or through an API. In this service delivery model, the end users simply to concentrate on managing users to the system. SaaS is common for applications like customer relationship management (CRM), human resources management (HRM) applications, and financial and accounting applications. In this system, updating software in one location and instantly accessible to the end users. [7]

ERP implementation cost

The ERP implementation price usually between 100 and 250 percentage of the cost of software license for implementation. If the size of the organization is large and it requires more customization, implementation will be more expensive. [3]

The following are the major factors that decides the cost of implementation.

- *Architecture of the system:* Some ERP solutions are more expensive to customize and deploy, due to how they are designed and what features and modules the vendor is able to offer out of the box.

- *Number of users:* Larger organizations with many users across division may need superior functionality and customization, which can rapidly increase costs.
- *In-house vs. outsourced implementation services:* Smaller organization with expertize IT team are not required to find an outsourced implementation service. Suggested to avail third-party service that has expertise with implementing the selected platform.
- *Level of customization and Application requirement:* if the organization needs more application and customization, the implementation cost will be more. Some organization have more complex requirement compared to other organization which requires fewer applications.
- *Migration:* Migrating from proprietary, old and a number of dissimilar system to new ERP systems can cost more.

II. ERP Deployment Models

On-Premise ERP

On-Premise ERP solutions are deployed within the company's hardware and servers and then controlled by their IT experts. The company owns the hardware and software. On-premise ERP solutions typically involve more upfront and continuing investments to procure and manage the software and the associated hardware, servers, and facilities required to run it.

Hosted ERP

The ERP solutions which are hosted on a remote rented server and use the application through an active internet connection. Web-based ERP is set up as single tenant, meaning that the business has its own virtual application and database servers. Scalability of this services is always time-consuming. Integrating additional new modules, software updates, and other system enhancements will require substantial migration time.

Cloud ERP

Cloud based ERP as well called as Software-as-a-Service (SaaS) is delivered as a service by the cloud service providers. With this type of implementation, a business's ERP software and its related data are stored and controlled virtually (in the Internet "cloud") by the ERP vendor and are accessed by clients using a web browser. For cloud-based ERP, preliminary costs are typically considerably less because business only deploy the software to their requirements and then access it through their computer's internet connection.

The cloud ERP provider hosts and manages all of the IT infrastructure for the organization, ensures the system is uninterrupted running, that the data is securely protected, and that product improvements are rolled out painlessly to company solution without disturbing their earlier implemented customizations [4][9].

Benefits of Cloud based ERP Implementation at SMEs

Inexpensive: Entire hardware is the accountability of the cloud service provider. There is no need of any hardware at SMEs' location. In addition to that the cost of software also less. SMEs no need to buy licenses[6]. They only need to pay based on the usage of a specific service.

Unrestricted Access: All the employees, management, and stake holders can access the system according to the privileges already granted to them. They can access through wireless or wired using many devices of their choice.

Improved Scalability: The integrated built-in feature of cloud computing to deliver flexible levels of scalability to IT resources. It reduces the expenditure. As well the evident financial benefit to the automated reduction of scaling, the ability of IT resources to always meet and fulfill irregular usage loadsevadepotential loss of business that can take place when usage thresholds are met.

Full-Fledged ERP Systems: SMEs can have access to complete ERP systems without the necessity of implementing their own IT department or to lease a costly IT specialist. Analyses have been carry out from the view of cloud ERP service providers.

Improved Integration: It can be effortlessly combined with the fingerprint, biometric, swipe and other machines already working in SMEs.

Zero downtime: Nearly 100% uptime can be expected. Still it also depends on the trust factor of cloud service provider and the opinion from the present customers.

Imminent Needs: Scalability, Availability, load balancing, Security, highest load performance becomes very simple. Normally support for the above is offered by each cloud service provider.

Cost Comparisons of Cloud based ERP with On Premises ERP

While comparing the costs of options for cloud based ERP solutions will need to factor in the cost of licensing, hardware and in-house IT support. The on premises solutions comprises

the price to buy the hardware at first and upgrade it every four years, along with in-house IT support cost. Other factors like capital cost, savings of electricity, and implementation and upgrading cost also measured.[3][8]

Cloud based ERP solution will support SMEs to manage the following costs by:

- Neglecting up-front hardware procurements or updates
- Paying an anticipated, regular, user subscription fee
- Receiving software updates and support without annual charges

III. Challenges for Cloud based ERP

The key challenges in implementing a Cloud based ERP solution vary to some extent depending on whether the implementation is from scratch or a migration from an existing solution to a cloud as SaaS. Moreover, the key challenges are common to both methods.[1][3][5]

Following are the key challenges to implement the cloud based ERP in SMEs:

- Identifying the optimum architectural and licensing models
- Data security in the cloud and lack of confidence
- Issues related to Technological aspects as of set up, migration, maintenance, testing etc.
- Issues as the performance and reliability of the cloud based ERP
- Complete monitoring, investigation and building trust in the implementation of the cloud based ERP.
- Issues related to mobile access and provisioning
- Customization to the organization needs
- Limited resources and budget
- Low awareness and perception about ERP
- User onboarding and training

IV. Conclusion

It has been recognized that cloud computing will be supportive in refining the cost, maintenance and technical competence of ERP implementations in small to medium enterprises. More companies will be served with cloud based ERP as SaaS. SMEs' will not be necessary to maintain and control the hardware and software used. SMEs are permitted to pay as they use the service, rather than making a capital investment. Trades and workflows outside of the enterprise, sourcing, procurement, supply chains, and trade finance are suitable for cloud computing. However, apart from the benefits few issues

which need to be addressed. The issues can be overcome with proper planning with right team of experts.

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