

International Journal of Advance Research in Computer Science and Management Studies

Research Article / Survey Paper / Case Study

Available online at: www.ijarcsms.com

Explore the Impact of Cloud Computing on ERP Systems used in Small and Medium Enterprises

Meganathan Ramasamy¹
Department of Computer Science
SSSUTMS
Bhopal – India

Jeyanthi Periasamy²
Software Engineer
HCS
Erode – India

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 ERP deployment models, comparison between them, factors which determines ERP implementation cost, and challenges of moving ERP services to the cloud and present a framework that IT executives can use to assess the feasibility of cloud-based ERP systems for their organizations.

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 developing to address these emerging requirements of all enterprises. ERP systems are integrated software packages with a common database that support business processes in organizations regardless of size. They comprise different functional modules that reflect the departmental structure of an organization (accounting, procurement, sales, production, warehouse, 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]

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 based 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 deploys 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 uninterruptedly 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].

III. COMPARISON OF CLOUD BASED ERP WITH ON PREMISES ERP

The criteria used for comparing the cloud based ERP with on premises ERP are Infrastructure cost, implementation cost, license cost, maintenance cost, data security, scalability, customization capabilities, up gradation.

Criteria	Cloud based ERP	On Premises ERP
Infrastructure Investment	No capital expenditure required for hardware infrastructure.	Heavy upfront capital investment required for the hardware
Upfront License cost	Cheaper upfront cost. Flexible licensing	Required. Limited licensing
Maintenance cost	Not Required	Required
Availability	Access anywhere and anytime through internet	Limited Access. Access through private network
Scalability	More scalable and flexible	Limited and Rigid
Implementation	Usually take a lesser amount of time for implementation. Limited customization leads less implementation time.	Implementation process can take significantly longer. Implementation process is completely controlled by the organization.
Up gradation Cost	Free of cost	Additional cost is required for up gradation
Data Security	Completely controlled by the vendor	Business has the complete control over data security.
Customization	Less customizable in general. Customization is frequent and comparatively cheaper as the vendor takes care of all necessary updates and upgrades.	Can be customized to a large extent to match even very niche needs. Businesses need to be well versed with all security protocols

TABLE I: Comparison of Cloud Based ERP With On Premises ERP

Data security is normally the upmost concern for potential ERP customers. They are seeing how critical the data stored in an ERP system is, including their financials, corporate trade secrets, employee details, information about their clients and more. However purchasers were once uncertain of the security of cloud-based solutions, many today are becoming less. Trustworthy cloud service providers have high standards in position to retain data safe. To further ease concerns, potential organizations can look for a third-party security audit of a vendor they are considering. This can be exactly convenient if the vendor is unfamiliar.

Further than data security, there are more functionality concerns to consider. Mobile access is a problem for on premise ERP implementations. It requires a third-party solution to link between on-premise ERP and smart mobile phones. Most advanced cloud solutions support easy mobile access, and most of them even provide native mobile apps. But this creates with greater security considerations, particularly if personnel are gain access to business data on their personal smartphones.

On-premise systems are commonly stress-free to customize. For many organizations, the capacity to customize to their precise desires and necessities is vital, exclusively in niche industries, for example, specific entrepreneurs with distinctive practices.

Establishments with less specialized needs, for example, common consulting firm can acquire with a cloud based solution's out-of-the-box capabilities.

IV. 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. [6].

The following are the major factors that decide 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.

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 within-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 a anticipated, regular, user subscription fee
- Receiving software updates and support without annual charges

V. CHALLENGING 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 on boarding and training

VI. 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.

References

1. Purohit, G. N.; Jaiswal, M. P. and Surabhi Pandey, Ms.. "Challenges Involved in Implementation of ERP on Demand Solution: Cloud Computing", *International Journal of Computer Science Issues (IJCSI)*, 2012.
2. MalizaSalleh, Siti; Yen Teoh, Say; and Chan, Caroline, "Cloud Enterprise Systems: A Review Of Literature And Its Adoption" (2012). PACIS 2012 Proceedings. Paper 76. <http://aisel.aisnet.org/pacis2012/76>
3. James B. Mattison and Saideep Raj, "Key questions every IT and business executive should ask about cloud computing and ERP" Accenture White Paper.
4. Petra Schubert, FemiAdisa, "Cloud Computing for Standard ERP Systems: Reference Framework and Research Agenda" *FachbereichInformatikNr. 16/2011*, ISSN (Online): 1864-0850
5. FathimaHaseen Raihana, "Cloud ERP - A Solution Model", *IRACST - International Journal of Computer Science and Information Technology & Security (IJSITS)*, ISSN: 2249-9555, Vol. 2, No. 1, 2012
6. Ms. ShivaniGoel, Dr Ravi Kiran , Dr Deepak Garg, "Impact of Cloud Computing on ERP implementations in Higher Education", *(IJACSA) International Journal of Advanced Computer Science and Applications*, Vol. 2, No. 6, 2011
7. Ahmed E. Youssef, "Exploring Cloud Computing Services and Applications" *Journal of Emerging Trends in Computing and Information Sciences*, Vol 3.No.6, July 2012
8. Muscatello, J. R., Small, M. H., and Chen, I. J. 2003. "Implementing Enterprise Resource Planning (ERP) Systems in Small and Midsize Manufacturing Firms," *International Journal of Operations & Production Management* (23:7/8), p. 850.
9. MalizaSalleh, Siti; Yen Teoh, Say; and Chan, Caroline, "Cloud Enterprise Systems: A Review Of Literature And Its Adoption" (2012). PACIS 2012 Proceedings. Paper 76. <http://aisel.aisnet.org/pacis2012/76>.

AUTHOR(S) PROFILE



Meganathan Ramasamy, MS graduate from Birla Institute of Technology and Science has worked on Higher Educational Institutions in Sultanate of Oman. He has over two decades of experience in the field of Networking and Information Security. He is currently as Research scholar at Sri Satya Sai University of Technology & Medical Sciences.



Jeyanthi Periasamy, MBA graduate from Periyar University and MSc Computer Science from Vinayaka Missions University. She is currently working at Hitech Computer Systems as a Software Engineer.