

AN ANALYSIS UPON DESIGN OF CLOUD BASED STANDARD ERP SYSTEMS: OPPORTUNITIES AND CONCERNS

www.ignited.in

International Journal of Information Technology and Management

Vol. X, Issue No. XV, May-2016, ISSN 2249-4510

AN INTERNATIONALLY INDEXED PEER REVIEWED & REFEREED JOURNAL

An Analysis upon Design of Cloud Based Standard ERP Systems: Opportunities and Concerns

Rituraj Jain¹* Dr. Manaullah Abid Husain² Dr. Vikas S. Chauhan³

¹Research Scholar, Maharishi University of Information Technology, Lucknow, India

²Associate Professor, Department of Electrical Engineering, Jamia Millia Ismalia, New Delhi, India

³Associate Professor, Dept. of Computer Science & Information Technology, Maharishi University of Information Technology, Lucknow, India

Abstract – The paper puts forward by cloud based architecture as a framework for ERP system. First, it describes the theory and development of ERP system than analyzes the principle of the ERP system in detail which is based on cloud architecture, and discusses the advantages of the ERP system that uses this method to design; finally, it presents the shortcomings and future development trends of this kind of cloud based ERP system.

In modern era the pace of shift in technologies trends and demands of companies is very fast. Earlier, most of the enterprises used ERP systems which were integrated software packages with a common database that supported business processes of companies. In addition, they were the backbone of large business enterprises. However, along with several advantages some challenges such as high installation cost, huge initial investments, high cost of maintenance, trained technical staff, regular system updating and data management and licensing are also associated with its usage. Furthermore, many companies today are thinking to move the whole ERP over to the cloud. Cloud-ERP is being preferred by most of the companies because of its capability to analyze massive data sets without making a significant capital investment in hardware, licensing and so on. It has been gaining increasing attention over the last few years and is being hosted in a platform over the internet. Most of the enterprises are concentrating towards using this technology because of its flexibility, easy to use, cost of setup and provision of much more features that could be accustomed to almost every type of business.

INTRODUCTION

This ERP (Enterprise Resource Planning) is the information system about the management of the enterprise, which is developed on information technology and systematic management thinking, decision-making for businesses and employees to run the means to provide decision management platform, and it can integrate all resources of enterprise. It is an effort to provide regional, cross-departmental, and also cross-company integration of real-time information management system. Through controlling and managing corporate sales, procurement, production, logistics, human resources, production equipment, capital and other resources, to achieve the optimal allocation of resources within the enterprise, to improve production efficiency market and responsiveness.

ERP is a management philosophy, which relates the internal resources and business with external resources. By ERP software, we can integrate the material, production, supply, marketing, financial and related logistics, information flow, manage flow, cash flow, value flow, and others, to achieve resource optimization & sharing. ERP system includes all steps of the process of production management, and plays an irreplaceable role.

This paper, using cloud-based ERP system architecture and application, aims to construct common, open features, to meet the integrated requirements of manufacturing, and to support network applications. ERP systems can support enterprise customization and the rapid implementation with the new cloud based system architecture. We achieve real time of ERP system, for enterprise. The role of Internet, web services on Cloud and mobile computing is considerable in ERP without these tool no one industry can survive or make relevant strategies in cut thought competition in business scenario. In coming future we can't think about ERP without Cloud computing and mobile computing.

Clouds are four types which are public, private, community & hybrid. Here we use hybrid cloud for information sharing & low cost ERP working. Cloud Computing provides three types of service models such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS) & Software as a Service (SaaS).

Cloud computing integrates various latest technology such as data warehousing, mining, knowledge management, decision support system, mobile computing, wireless technology, 3G services, high performance computing, Industrial Robots, Automated Machine, remote sensing, satellite technology, Web base geographic information system(GIS), Model-base management system, Spatial database management system. This system provides information about production field's data which helps in decision making. This system has alert system for any abnormal situation.

This system increases the profitability of the business & SME by reducing the cost of production. In the cloud computing based ERP system provides following universal vales.

- 1. Initial cost reduction in IT (reducing capex).
- 2. Resources are available on demand on rent.
- 3. Up gradation & Maintenance, Scalability are easy on cloud.
- Rapid development & integration with other 4. services on cloud are easy.
- 5. Best practices are applied in Business scenario.

Earlier, most of the enterprises were highly emphasizing on use of ERP as it was the mirror image of major business processes of organizations, such as customer order fulfillment and manufacturing and establishing integration between different departments of organization effectively etc. It was an integrated computer based application used to manage internal and external resources including assets, financial resources, materials & human resources to improve efficiency of enterprise (Johansson, 2015). It was built on a centralized database and was normally utilizing a common computing platform. The main features of ERP were flexibility; centralized database, supporting third party software, routinization, standardization, and integration. Managing information for high quality delivery to decision makers at right time, automating process of data collection, smooth flow of information across departments, developing and maintaining an enterprise wide database, faster response time, etc. However, along with several advantages, ERP vendors suffered from the perception that their software was difficult and costly to implement. In order to overcome such issues, the vendors were being forced to move from client/server to browser based architecture. But today, Cloud computing could be considered as a model for enabling ubiquitous, convenient, on-demand network access to shared pools of configurable computing resources (e.g., networks, servers, storage, applications, and services) that could be rapidly provisioned and released with minimal management effort or service provider interaction. It could promote availability and is basically composed of five essential characteristics, three service models, and four deployment models (Haddara, 2015). Besides, self-provisioning, pay-per usage, on-demand availability, scalability and resource pooling are the major business advantages of cloud-computing in the emerging competitive arena for companies.

To overcome the problems arising from ERP; enterprises are moving towards using Cloud ERP in their business functions. Cloud ERP is designed to address the inflexibility of existing ERP software's by allowing businesses to choose the deployment option that fits their specific needs.

Cloud ERP is a flexible and cost-effective option for small and medium-sized businesses and offers extensive benefits for growth and expansion (Ruivo, 2015). It is an enterprise resource planning software that is hosted in a platform over the Internet. The present study tries to explore the key reasons of transition from ERP systems to the Cloud-ERP and the factors which encourage enterprises to switch over to Cloud-ERP. In this regard the survey is designed to measure the drastic changes due to the emergence of the new IT system and its impact on the business operations of enterprises. Besides the study also tries to cover the direct and indirect aspects of Cloud-ERP software system on business operations of enterprises.

Enterprise Resource Planning (ERP) is used more than a decade Enterprise. Enterprise Resources Planning (ERP) systems are enterprise-wide information system packages, which consist of a comprehensive set of software modules that aim to support and integrate all key business processes across various functional divisions of an organization by using a single data repository. Strategy process looks at how strategy is implemented in modern business as a precursor to defining how Business applications can integrate organizational goals into Key Performance Indicators (KPIs).

Business maturity models are presented as a roadmap to measure the capability and readiness of an organization to progress Business, and business tools are discussed from the perspective of selection, integration strategies and delivery platforms suited to

International Journal of Information Technology and Management Vol. X, Issue No. XV, May-2016, ISSN 2249-4510

SMEs culminating in a best practices framework for Business integration in the all sectors.

Resource Planning System (ERP) is integrated information system with centralized database, which supports main business processes across organization. These systems are among most complex software solutions ever built, and are equally expensive. Traditional SaaP (Software as a Product) on-premise ERP systems imply significant investment in hardware infrastructure and purchasing software licenses. In addition, implementing ERP system in enterprise is costly, time-consuming, high risk process that extends over several years, and it often requires business process reengineering . Cloud computing can ensure the benefit of both vendor and the business user. Every organization is in a global world where all the businesses are very much familiar to use information communication technology (ICT) for processing daily work .This is only part of the challenge, though. Forecasted growth will generally have at least some impact on IT operating costs. Here assumed that cloud is not only created for the ERP the total support and establishment of ERP will be from a cloud . ERP software developers are finally catching up to this expectation, creating dynamic new models of mobile connectivity that will allow for on-the-spot responsiveness at all levels. Any company involved in an ERP evaluation and selection process needs to consider the role of mobile apps in its overall business solution.

Cloud ERP is Enterprise Resource Planning software that is hosted in a platform over the Internet. The use of the term —Cloudll includes a broad set of applications and software deployment models, namely Software-as-a-Service (SaaS). Software as a service (SaaS) is a software delivery model in which software and associated data are centrally hosted on the cloud by independent software vendors or application service providers on the cloud.

MAJOR BENEFITS OF CLOUD-ERP

Major opportunities that arise from Cloud-ERP implementation are as follows:

- Rapid scalability and deployment capabilities (providing just-in-time computing power and infrastructure)
- Decreased maintenance/upgrades cost and schedules
- Improved resource utilization—elasticity, flexibility, efficiencies
- Improved economies of scale

- Improved collaboration capabilities (Salim S. A., 2015)
- Ability to engage in usage-based pricing, making computing a variable expense, rather than a fixed capital cost with high overhead
- Reduced information technology (IT) infrastructure needs—both up front and support costs
- Capacity for on-demand infrastructure and computational power
- Green friendly –reduced environment footprint
- Increased speed to implementation

CHALLENGES OF CLOUD ERP

Many companies are somewhat wary of swapping their existing IT architecture for an integrated ERP solution. For large-scale companies which involve considerable investment, and comprehensive knowledge and experience. But to introducing more ERP applications among SMEs there are some challenges. Main problems/issues/concerns that enterprises deal with in case they exercise Premises based ERP in place of Cloud ERP are:

- Speculation or Investment in setting up the confine or Local enterprise level network and other Information Technology resources that cannot be vindicated in short terms.
- Multi-user entre restricted within the premises and that's why calls for further investment if business are geographically isolated.
- Potential to inflate the client base of the Enterprise planning software hastily without any subsequent IT expenditures.
- Always on application access/entree and sharing ability/aptitude for all teams or groups occupied in real time.

Also there are challenges in the implementing the ERP clouds such as Legal issues, Data security, Difficulty of extracting data, Technological aspects issues and transparency and data privacy. But for SMEs the challenges are Perception, Cost, Limited resource, Awareness and Customization issues.

ERP SYSTEM DEVELOPMENT STATUS

In Europe, USA and other developed countries, the applications of ERP systems are very popular, and

the majority of medium and small enterprises have been widely used ERP systems. All Countries have already put ERP as the pillar of enterprise survival in the modern digital era. Agile enterprise logistics system and global supply chain management technology are being currently accepted by many enterprises.

These days ERP system areas have scope beyond the enterprise resource planning and management. Ecommerce has entered the stage of collaborative management circumstances, and will lead to emergence a new generation of ERP systems, which faces global production system. Many people are talking about the future of ERP system, such as e-ERP, after the ERPI, ERPII, iERP etc.. These views are given by the people who have different points on the trend of ERP system. According to new development trend and management thinking for ERP system, a new generation of ERP must continue to attract advanced management ideas and management models, and to take the advantage of the technological innovation about Internet so that the whole software system is developed on the cloud .

Requirements of the enterprises are Qos-enabled (Quality of services), secure and scalable system. The enterprises should have a capability of providing their business management services with internal or external interoperable mechanism which can be easily deployed within various cloud models.

User's requirements are a simplified interface with adaptability and self-learning capability that should cover transparent pricing, metering and service level agreements (SLAs). A user-centric privacy, encryptiondecryption will increase the stability and usability of ERP-cloud services.

Requirements of service providers are efficient service architecture to support infrastructure and services is needed in order to provide virtualized and dynamic services. A well-organized and secured data management and storage mechanism is herewith required along with a smart cost model.

CLOUD ERP ADOPTION OPPORTUNITIES AND CONCERNS

Enterprise Resource Planning systems (ERPs) constitute the basic information systems software in a modern business environment as well as the typical model of computing in an organization. These systems offer a way to efficiently plan and manage the resources of an entire company through the integration of its information and information-based processes across functional areas as well as beyond the organizational boundaries. The benefits of adopting an ERP include for example; cost reduction, better customer service, improved productivity, better.

There has been a lot of hype about how cloud computing, and particularly Software as a Service

(SaaS), is the wave of the future which will sweep and replace the traditional on-premise software delivery model. This hype is supported by the remarkable acceptance and success that cloud computing has received over the last years. Cloud computing has seen the size of its industry to expand from \$17.3 billion to a forecast of \$43.2 billion in 2012. Furthermore, cloud computing is predicted to play an increasingly important role for businesses in the future. An indicative example is the 2012 survey conducted by Gartner and Financial Executives Research Foundation, where 53 percent of the surveyed CFOs seemed to believe that over 50 percent of their company's transactions will be delivered through the cloud over the next four years, as compared to the respective 12 percent which is currently the case. Major software providers such as Microsoft, Oracle and IBM have noticed this trend and are now offering hosted versions of their products while other more established vendors such as SAP along with newly emerged SaaS providers offer innovative cloudbased offerings.

Following the success of cloud computing, the new cloud-based delivery model of ERP has emerged. These ERP solutions are marketed to offer similar functionality as their on-premise counterparts, but the infrastructure (software, computational power, hardware etc.) is provided on-demand by the vendors in a pay-per use model. As with cloud computing, this new ERP delivery model gains success increasingly growing its market share. Most companies at least consider a cloud-ERP solution and this trend was illustrated by a 2012 survey conducted by Oracle where approximately 70 per cent of the CFOs stated that they would consider using a Cloud-based version of their ERP. Panorama's 2012 ERP Report quantifies the momentum of cloud-ERPs as it revealed that the market share of cloud-based ERP systems has grown from 6 percent to 18 percent just in one year, from 2011 to 2012 (Panorama Consulting). As the market moves to a cloud environment, traditional ERP providers are also forced to develop their own cloud based solutions, otherwise they risk losing market shares to the emerging Cloud ERP software vendors such as Netsuite and Plex. However, a question that still appears to lack a clear answer is whether cloud ERP is a viable solution for companies of all sizes.

METHODOLOGY

The study tried to use both primary and secondary data for the study. The secondary source were all the published data available on the relevant websites and the primary data was collected using a welltested and a structured questionnaire. In this regard, a total of 200 questionnaires were distributed to employees of various organizations in the IT industry to know their perception about usage of Cloud-ERP for business purposes. Purposive sampling technique was taken because researcher has

International Journal of Information Technology and Management Vol. X, Issue No. XV, May-2016, ISSN 2249-4510

specific purpose behind conducting this study. 100 male and 100 female respondents were selected. Of all the questionnaires, we received 160 filled questionnaires of which only 130 were found to be complete in all respects sand were hence used for the study. The data collected was tabulated and the Cronbach alpha test was conducted whose value was found to be 0.71 indicating the reliability of the responses.

Descriptive statistics was used to understand the responses regarding the adoption of the Cloud-ERP and the variation in the responses received with respect to its effect on business. Respondents were requested to submit assessments based on a Five point Likert scale and all items were measured by responses in agreement/ relevance with statements, ranging from 1- Strongly Disagree to 5 - Strongly Agree. F - test ANOVA was used to analyse the difference in the perception regarding the benefits of cloud ERP.

CONCLUSION

These days enterprises are facing increasing pressure, how to build cost effective ERP system that suits enterprise management mode, to assist decisionmaking and provide instant information and business process automation, has become an important issue. This paper introduces the theory and development of Cloud based ERP system status. It discusses the architecture of Cloud -based ERP system applications. When we integrate cloud architecture into ERP system, it brings various benefits to the application of ERP system, it improves the utilization efficiency of enterprise IT resources, to maintain a stable business network support, easy to use, Initial cost reduction in IT (reducing capex) and lower fixed investment, Up gradation & Maintenance, Scalability are easy on cloud, Rapid development & integration with other services on cloud are easy also resources are available on demand on rent. To ensure the successful implementation of ERP systems, we have to constantly improve the system, and enhance system reliability and security.

Accordingly, this study has established a set of opportunities and concerns that cloud ERP adoption raises from the standpoint of SMEs and large companies. The analysis of these opportunities and concerns as influential factors, with respect to the extant literature and empirical findings from semistructured interviews with four IT professionals, indicated that different factors hold different levels of importance with relation to SMEs and large companies.

REFERENCES

- Bhaskar Prasad Rimal, Admela Jukan, Dimitrios Katsaros, Yves Goeleven (2010). "Architectural Requirements for Cloud Computing Systems: An Enterprise Cloud Approach", J. Grid Computing Springer Science.
- Buonanno, G., P., et al. (2000). Factors affecting ERP system adoption: A comparative analysis between SMEs and large companies, Journal of Enterprise Information Management, 18(4): p. 384-426.
- Clohessy, T. (2011). Cloud Enterprise Resource Planning (ERP): A Viable Alternative for
- Duan, J., et al. (2013). Benefits and drawback of cloud-based versus traditional ERP systems, in the 2012-13 course on Advanced Planning, W.J.H. Resource van Groenendaal, Editor.
- Ellen F.Monk, Bret J. Wagner (2009). "Enterprise Resource Planning", Cengage, pp. 35-40.
- Haddara, F. a. (2015). Cloud ERP Systems: Anatomy of Adoption Factors & Attitudes. In F. a. Haddara.
- Irish e-Government. J.E Cairnes School of Business & Economics National university of Ireland Galway, Information system, Ireland.
- Johansson, T. e. (2015). Cloud ERP Adoption Opportunities and Concerns: The Role of Organizational Size. In System Sciences (HICSS). IEEE, pp. 4211-4219.
- Lenart, A. (2011). ERP in the Cloud Benefits and Challenges, in Research in Systems Analysis and Design: Models and Methods Lecture Notes in Business Information Processing. p. 39-50.
- M. B. Motalab and S. A. M. Shohag, (2011). Cloud computing and the business consequences of ERP use, I International Journal of Computer Applications, pp. 28-31.
- Mary Sumer (2009). "Enterprise Resource Planning", Pearson, pp. 2-13.
- Miranda, S. (2013). ERP in the Cloud: CFOs See the Value of Running Enterprise Applications as a Service. Financial Executives International, 29(1): pp. 65-66.

- Ruivo, P. R. (2015). The ERP Surge of Hybrid Models-An Exploratory Research into Five and Ten Years Forecast. Procedia Computer Science, pp. 594-600.
- Salim, S. A. (2015). Moving from Evaluation to Trial: How do SMEs Start Adopting Cloud ERP?. Australasian Journal of Information Systems.
- William Y. Chang, Hosame Abu-Amara, Jessica Feng Sanford (2010). "Transforming Enterprise Cloud Services", Springer Heidelberg, pp. 43-46.