

ERP SYSTEMS: PROBLEMS AND SOLUTION WITH SPECIAL REFERENCE TO SMALL & MEDIUM ENTERPRISES

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ABSTRACT

Enterprise Resource Planning (ERP) systems have become basic business information processing requirement for organizations, seeking growth. Successful implementations of ERP have been proven to be beneficial for large as well as small organizations. Factors affecting ERP adoption in small scale organizations are different than their larger counterparts. There are some issues before small scale enterprises in implementing on – premises ERP solutions. The paper presents an extensive review of ERP systems, their benefits for organizations. The paper discusses issues before small and medium enterprises in implementing on – premises enterprise resource planning systems. The paper also gives a brief introduction to the cloud computing and cloud based ERP systems as an alternative solution to the on – premises ERP systems for small scale organizations.

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INTRODUCTION

ERP systems help companies manage and streamline all processes of business smoothly through integration. ERP integrates all the information following through a company and provides access to real time information. Small and Medium Enterprises are described as the backbone of an economy. Though individually small, this sector has emerged as a dominant player in most economies. In India the MSME sector contributes 8 per cent of the country's GDP, 45 per cent of the manufactured output and 40 per cent of its exports. The MSMEs provide employment to about 60 million persons through over 26 million enterprises producing over six thousand products. The labor to capital ratio in MSMEs and the overall growth in the MSME sector is much higher than in the large industries. The geographic distribution of the MSMEs is also more even (MSME Annual Report, 2010-11). SMEs need low cost effective information and communication systems, which can fulfill their demands within their budget. The IT budget of small units is much lower than their larger counterparts. Newer technologies offer low cost or open source solutions that, SMEs can employ (Free and Low Cost Solutions for SMEs, IAMAI, 2010). Small and medium businesses (SMEs) are now competing globally and they need to be more competitive to win in the global competition. In this complex business environment, small firms must develop themselves strategically in order to remain competitive, grow, and prosper. India's SME sector is vibrant, dynamic, flexible and productive entity. It is essential for Indian SMEs to deploy appropriate information and communication tools to leverage business advantage. SMEs are using ERP to enhance their growth, and to manage the information systems of their organizations. Even though ERP systems were initially thought to run on large scale enterprises, SMEs are increasingly motivated to implement ERP. As companies grow in size and improve performance, they are most likely to have invested in ERP system that will grow with them. The objective of the study presented in this report is to obtain an understanding of the information needs of small and medium industries their problems in implementing integrated IT systems such as Enterprise Resource Planning systems and to discuss the potential suitability of a Cloud-based ERP system to answer these needs. The paper review new cloud computing technology to establish whether a cost- effective system, based on the Internet, could be used to provide SMEs with a resource to answer their information needs.

ENTERPRISE RESOURCE PLANNING SYSTEMS

Enterprise resource Planning (ERP) systems are sophisticated IT infrastructures (Gupta, 2000) where integrated management software systems maintain a central database system

along with a set of programs to store, manipulate and retrieve information. ERP systems are software solutions integrating the various functional spheres in an organization and as a link through the entire supply chain, aimed at adapting best practices for providing the right product at the right place at least cost (Rao, 2000). ERP means the techniques and concepts for integrated management of business as a whole for the effective use of resources to improve the efficiency and productivity of the enterprise (Ehie, et. al., 2005). Evolved from MRP-II and MRP around early 1990s, the ERP systems incorporate all the functionality of its predecessors, in addition to Finance, Supply Chain, Human Resources and Project Management functionality. ERP packages are software packages that support these ERP concepts. These integrated software packages covers the most of the business functions such as- Production planning, finance, marketing, R&D, production, Sales & distribution. International ERP vendors are preferred to local systems in the ERP system adoption (Huang, et. al., 2009). ERP supports much faster and dynamic decision structure, which modern businesses need. ERP systems are considered as an essential information system infrastructure which provides day to day transaction processing as well as decision support systems for organizations to survive and prosper in today's economy. Organizations use ERP to reduce lead times and inventory levels along with better communication with suppliers, distributors and end user customers and increased customer satisfaction as other benefits (Gupta, 2000).

ISSUES RELATED TO ERP

Enterprise Resource planning systems have been a significant area of research in the field of information technology management, since their advent in early 1990s. An extensive research has been done on the benefits of successful ERP implementations and critical factors affecting the success and failure of an ERP implementation in organizations.

ERP systems are highly implementation dependent. Designed to model and automate the basic processes of a company, ERP system can either boost or doom a company, if implemented successfully or unsuccessfully. Successful implementations of ERP systems can bestow impressive strategic, operational and information-related benefits to adopting firms (Muscatello, et. al., 2010). Top management setting the strategic direction of the implementation process, continuous support and monitoring of the implementation process, sound and thorough understanding of project management principles and its application is critically linked to successful ERP implementation (Ehie, et. al., 2005). Factors considered critical to the success of ERP implementations are definition of business goals, establishment

of executive management planning committee, considering implementation as research and development, cross-functional teams, stocking implementation teams, alignment of everyone's interest by giving mid-level management hands-on responsibility, constant communication with teams and end users, excellent project management, choice of partners, extensive education and training, management with data, measurement of the right things, establishment of aggressive achievable schedules, and no fear for change. Post implementation ERP benefits are tangible as well as intangible. The benefits are evident in the long term. The business process, process efficiency and profitability increase in fourth or fifth year (Huang, et. al., 2009). User satisfaction is also part of the intangible benefits (Wu & Wang, 2006). Large firms possess more advantages than small and medium-sized firms in ERP system adoption (Huang, et. al., 2009). ERP implementations are very critical. There are many challenges that an organization has to face in implementing ERP. Analyzing requirements, selecting a suitable solution, change management, to decide the extent of customization and post implementation analysis are some of the challenges. According to, Umble & Umble (2001) factors which cause the failure of ERP implementation are top management failure, poor project management, lack of education and training, people do not want new system to succeed, unrealistic expectations about implementation, inaccurate data, attempt to automate existing redundant or non-value-added processes, mismatch between business and ERP system selected, and technical difficulties in ERP implementation (Umble, et. al., 2003). Nine factors are found to be critical in literature for the failure of ERP implementations: excessive customization, dilemma of internal integration, poor understanding of business implications and requirements, lack of change management, poor data quality, misalignment of IT with business, hidden costs, limited training and lack of top management support (Momoh, et. al., 2010).

ISSUES BEFORE SMES REGARDING ERP

ERP implementations have been successful in large enterprises, but in case of small enterprises the scenario is different. There are significant differences between small, medium-sized and large enterprises regarding the objectives and constraints of ERP system adoption. Small enterprises experience more knowledge constraints than large (Laukkanen et. al., 2007). The integrated information systems like ERP are needed more in the SMEs that lack the money power and business resilience of large enterprises, while ERP markets are expensive and smaller organizations cannot afford them. An ERP implementation takes much time to complete and requires a large amount of IT investment and their effectiveness is hard

to evaluate. SMEs need micro ERPs i.e. near ERP capabilities built into a product and sold at an affordable price, including implementation (Rao, 2000). The criteria for ERP selection in SMEs should be affordability, domain knowledge of suppliers' local support, technically upgradable and use of latest technology (Rao, 2000).

Over the past few years, the number of large companies buying new ERP systems has reached saturation point. This has led to the ERP developers seeking instead other potential markets among SMEs (Deep, et. al., 2008). ERP vendors are turning their marketing sights on small and medium-sized manufacturers (Muscatello, et. al., 2010). They provide simpler and cheaper solutions from the organizational and technological point of view, pre-configured systems based on best practices at a fraction of cost originally required and less implementation. In spite of such promises there is no general agreement on the effectiveness of such systems. As a result the current rate of ERP adoption in SMEs is lower than the large enterprises. Awareness, Perception, Earlier implementations, implementation approach, cost, change management and limited resources are some of the reasons for their concern towards ERP (Kale, et. al., 2008). Identification and estimation of cost in ERP implementations is problematic for both implementers and SMEs. Many ERP implementations cross their budgets due to unpredicted costs and schedule delays because of unforeseen costs and delays (Haddara, 2011). The top most critical success factor for the successful ERP implementation at Indian SMEs is clear business plan and vision followed by top management commitment and support (Ganesh & Mehta, 2010). Time and money as the two common denominators used in manufacturing businesses as the bases for control and performance measurement are strongly tied to the success of an ERP implementation. By managing both the time and money aspects of an ERP implementation a firm can significantly increase their chances of success (Muscatello, et. al., 2010). SMEs generally use their ERP system to generate a plan for production and use it as a guideline. There is a lack of knowledge and expertise in modification, feedback and management required to enable ERP systems to perform better as a production planning and control tool (Koh, et. al., 2006).

There are fewer studies regarding the ERP systems in Indian SMEs.

Singla in 2008 studied two midsized public sector enterprises to find the impact of ERP on the enterprises. Empirical data results provided general support for the hypotheses that ERP adopters are consistently higher in performance across a wide variety of measures than non-adopters. Overall, this suggests that indeed ERP systems yield substantial benefits to the firms that adopt them, and that the adoption risks do not exceed the expected value, although there is some evidence (from analysis of financial leverage) that suggests that

perceive ERP projects to be risky. There also appears to be at optimal level firm do indeed of integration in ERP with benefits declining at some level (Singla, 2008).

Kale in 2008 Found that the reasons of slow adoption rate of ERP in SMEs in India are - low level of awareness amongst SMEs for ERP, its vendors and applications; their perception for ERP that ERP is only for large companies; earlier failed ERP implementations, the approach SMEs use in implementing ERP and the change management they apply; and in the end high cost of ERP and limited resources (Kale, et. al., 2008).

Upadhyay in 2009 attempted to identify the factors to ensure positive outcome of successful implementation of the enterprise planning systems. Seven factors have been identified that are found to be crucial are: Support from Top management, goals and objectives, user knowledge, project champion , project team competency, improve work efficiency, scalability & scope and ERP importance. Issues critical to the SMEs are – Clearly defined scope of implementation, proper project planning, proper implementation strategy and minimal customization. The authors observed that inadequacy and lack the necessary technical knowledge of manpower dedicated exclusively for ERP systems, lower or no emphasis on training were common factors in organizations where ERP implementations have failed (Upadhyaya, et. al., 2011).

Kale, in 2010 surveyed the Indian SMEs for ERP performance analysis. The study showed that many Indian SMEs are using computerized information systems to reduce the cost and will switch over to some ERP for a single integrated system. Almost all companies surveyed have reported that they are benefited by the ERP implementation in reducing inventory, improved customer service, reduced planning cycle time and improved communication. According to the authors there are more intangible benefits of ERP and hence implementation should not be related with ROI. The top management support, user involvement and participation, good understanding of the concept of ERP are major contributors of ERP success (Kale, et. al., 2010).

The problems have been identified after survey of literature and interviews with the persons related to the information technology in SMEs. Higher cost of the ERP systems is the major problem for SMEs in using ERP systems. The cost includes expenditures incurred in buying the software, investment in hardware, fulltime IT staff, and renewal of software, upgradations and maintenance. Large amount has to be invested in capital expenditure and operating cost is also very high. However open source ERP systems can be beneficial for small industries but these systems also need investment in infrastructure. SMEs are startup units having centralized approach, which don't have enough funds and are reluctant to invest in costly IT

infrastructures. Small organizations often work for bigger organizations and are dependent on them in using IT systems; their IT needs still can be fulfilled by mere financial and accounting systems. Medium enterprises are more interested in implementing ERP systems in their organizations as their growth need a better IT infrastructure. Moreover, it is easier for large enterprises to take on the losses incurred in failure of ERP implementation, but the same in the case of an SME can make it sick or even close. It is difficult for SMEs to recover from that loss, as presence of recovery plans and funds are lesser in these organizations. It would be a better idea if SMEs could gain more benefits of ERP systems with lower investments in IT. Small and medium manufacturers in India are looking for solutions that are cost-effective, energy-friendly, sleek and easy to connect to people.

CLOUD COMPUTING AS A SOLUTION

Cloud computing describes a new supplement, consumption, and delivery model for IT services based on Internet protocols, which provides dynamically scalable resources on demand on the pay per use basis. The cloud computing model enables convenient, on-demand network access to a shared pool of configurable computing resources networks, servers, storage, applications, and services that can be provisioned and released with minimal management effort [22]. It is an emerging whereby services and computing resources paradigm are delivered to customers over the internet from a service provider who owns and operates the cloud [11]. It is defined as both the services delivered over the internet and the cloud (hardware and software at the data centers of the cloud provider) [23]. Cloud computing as a utility that user access based on their requirements without regard to where the services are hosted or how they are delivered [3].

Cloud computing provides small and medium businesses a break to access web based advance tools as a resource with lower cost [16]. Cloud based ERP is a cloud based service provided through the SaaS model where an organization installs its ERP package on service provider's site. The software is maintained by the cloud service provider and accessed by the owner enterprise on demand via internet. The cloud computing model makes the use of complex business solutions like ERP easier as it now can be installed and maintained by experienced IT companies on their premises. It provides usage of automated system interfaces where user does not need to care about backend engineering, maintenance and troubleshooting of ongoing operations [16]. Cloud has always been associated with flexibility and economic viability. It removes the need for SMEs to invest in IT assets or retain IT persons. Many ERP vendors now provide the cloud based ERP systems. For example SAP's

Business ByDesign, Netsuit and Ramco's On Demand ERP are some of the SaaS ERP systems. Open source ERP providers Compiere also provides cloud based ERP. SaaS ERP or cloud ERP is simpler to deploy from a technical perspective as the organizations don't need to purchase additional servers or physically install the software. The cost of cloud ERP varies from vendor to vendor and is based on cloud providers. The generally used cost model for cloud ERP is pay per user per month. Cloud ERP is much useful for small and medium businesses as they can use ERP with the lower initial cost and low or no maintenance cost. The capital cost incurred in deploying a cloud based solution is very low in comparison to the on premise based solution. A study discussed the scope of cloud computing for SMEs in India by comparing the on-premise ERP systems implemented in some SMEs with the available cloud solutions. It shows that cloud based ERP solutions are less costly and more adaptable than the on-premises ERP in context of SMEs [27].

However cloud services have their own limitation like security, privacy and availability etc which discourage small companies to invest in this technology. Availability, data lock-in, data confidentiality and auditability are the obstacles which affect adoption of cloud computing. Data transfer bottlenecks, performance unpredictability, storage scalability, distribution system errors and quick scaling at cloud provider side are obstacles to the growth of cloud computing. Reputation of the cloud provider, legality of cloud computing related issues and licensing of software are policy and business obstacles [23]. At present, service providers have inflexible pricing and consumers are restricted to offerings from a single provider at a time. Also, many providers have proprietary interfaces to their services thus restricting the ability of consumers to swap one provider for another [3]. Awareness about cloud based services and problems in adoption of a new technology are some other challenges in the way of cloud technology.

CONCLUSION AND FUTURE RESEARCH IMPLICATIONS

This paper is primarily an effort towards discussing the problems before SMEs in harnessing the benefits of ERP systems and suggesting cloud as a solution to some of their problems. Cloud computing can be a solution to the IT related problems of SMEs. But there are some issues in using cloud computing as security, privacy, third party and network dependence. Cloud based services needs to be analyzed and compared with the on-premise services so that SMEs can get clear insights into the benefits and limitations of both methods of implementing ERP systems.

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