

The Main Factors of ERP Systems in Small and Medium Enterprises

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Abstract: Enterprise resource planning (ERP) systems are implemented to increase the productivity and operational efficiency of corporations. ERP implementation projects are considered difficult and risky because these projects are large in scale and in most cases they bring about changes to the structure of organizations, culture and processes. In fact, the list of failing ERP projects in enterprises is quite long. There is lack of study on the failure and success factors of ERP implementation in small and medium-sized enterprises (SMEs). Equipping the enterprise with necessary capabilities to integrate and synchronize isolated functions to streamlined business processes and helping the enterprise to optimize resources for gaining competitive advantage in today's turbulent business competition, ERP has received great attention in big organizations. The history of the origin of ERP naturally refers to business empires and big organizations. But some factors led ERP systems to further intervene and penetrate in SMEs. These factors are the immense competition of suppliers in the market of big organizations, the awareness of SMEs from ERP advantages, the advancements in ERP systems, the advancements in information technology, and the emergence of open source ERP systems. In this study we discuss each of factors comprehensively.

[Maziyar Karbalaee Shabani, Nima Rasekhi, Shermineh Majdabadi Farahani, Sima Kalami. **The Main Factors of ERP Systems in Small and Medium Enterprises.** *J Am Sci* 2013;9(4s):58-62]. (ISSN: 1545-1003). <http://www.jofamericanscience.org>. 10

Keywords: Business, Challenges, ERP, SME, Technology

1. Introduction:

Enterprise Resource Planning (ERP) has widely been used in developed countries all over the world to streamline processes and for achieving process improvement and global competitiveness. But in recent years ERP vendors are trying to overcome the economic, cultural and basic infrastructural barriers concerning the implementation of ERP in developing economies. Immense turbulence in today's business environment pressures organizations to be sure that they can rapidly meet the customer needs and make timely decisions on their resources. Enterprise Resource Planning (ERP) equips the enterprise with the necessary capabilities to integrate and synchronize isolated functions into streamlined business processes. It also optimizes the resources available in or- to gain a competitive edge in the turbulent business environment. Enterprise Resource Planning is a set of applications that help manage and automate a business [4, 20]. A large database provides access to all application programs and serves in all areas within a manufacturing enterprise. This is accomplished by exchanging information with suppliers and customers directly or through trading community portals and e-commerce links, and with outsourcing partners [20].

Many companies have implemented an enterprise resource planning (ERP) system as a powerful alternative for an integrated information system to support speedy and accurate transaction processing and decision support functions [19]. The raise of SMEs' awareness about ERP advantages as well as the immense competition of vendors in the market of big organizations caused ERP to further penetrate in SMEs.

ERP is a strategic tool, which equips the enterprise with the necessary capabilities to integrate and synchronize isolated functions into streamlined business processes. It also optimizes the resources available in or- to gain a competitive edge in the turbulent business environment.

ERP automates the tasks involved in performing business processes such as order fulfillment, payments, material receipts, material requirement planning, invoicing etc., and make the same data available to all the other functions instantaneously [17].

Evolution of ERP in S.M.E.'S

Enterprise Resource Planning was a term restricted purely to elite class. This scene was witnessed in the IT market for some long time ever since ERP was introduced. The large organizations went ahead with ERP process unmindful of negative

consequences, not to forget mentioning the fact that they took every proactive measure to curb the same. Needless to say firms were interested in serving such

large players. So the fate of Small and Medium enterprises remained unanswered. ERP for SMEs remained a mere dream.

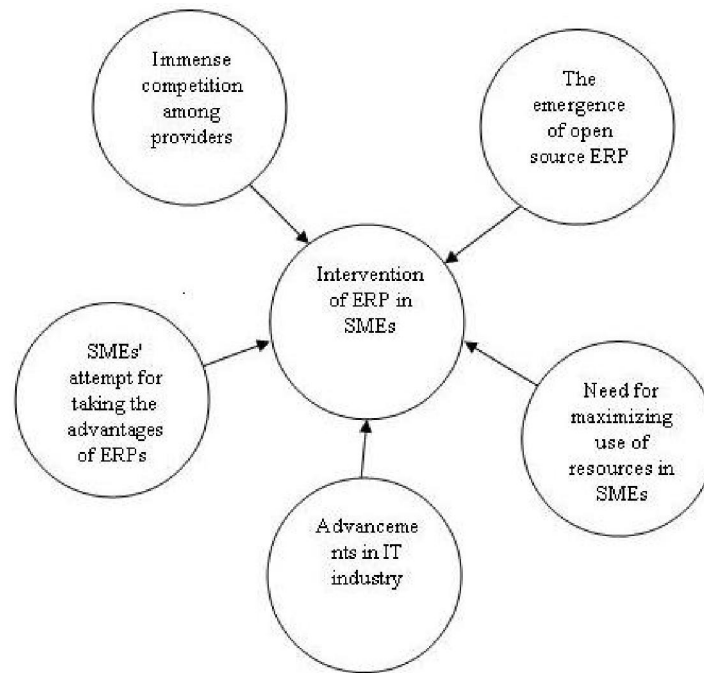


Figure 1: Major factors contributed in the intervention of ERP in SMEs.

It so happened that the number of larger companies without ERP turned out to be nil. Thanks to the awareness created by vendors and IT researchers. No doubt companies were initially hesitant lot and apprehensive on just hearing the word ERP. However the industry proved them otherwise. Then came a stage where a company could not exist but without ERP. Even if their performance was satisfactory they were not able to gain any competitive advantages.

This explanation of how empires adapted to ERP has lot of significance in studying their intervention with S.M.E. These bigger companies were not providing the required business to ERP vendors. Even though there are many big companies the number of vendors was always greater in multiples. This means only the best could strike deals and there was no possibility for mediocre or average vendors (in terms of performance). The best players also found that they had none to serve after a point of time because almost every company in the market successfully established ERP (whether on the first or further attempts).

So, they had to naturally look for greener and fresher pastures. SMEs were the only answer. The next question was how to provide best services at an affordable cost and still make profit. In this case the vendors had to be worried only about the number

of sales they could make and not the quantum of profits because the number of vendors was few and far between when compared with the number of SMEs choosing to go for ERP. As the saying goes "necessity is the mother of Invention" vendors had to devise cost effective applications to meet the demands of the Small and Medium enterprises. This was the origin of ERP for S.M.E.'S. This benefited them in terms of business. On the other hand the firms enjoyed greater benefits by making use of this application. Figure 1 shows the major factors contributed in establishment and evolution of ERP in SMEs.

In the following parts we investigate the above factors comprehensively.

The competition amongst big providers

Over the next three to five years, the most dynamic and innovative growth area in enterprise applications are users in the small and midmarket. With unique requirements that demand full capabilities without complexity, small and medium-size business (SMB) customers seek practical solutions with quick return on investment (ROI). Vendors, incumbents, and challengers alike, have responded to these demands with significant product and channel investments. The result is improvement across the spectrum of industry-specific and last-mile capabilities, usability, rapid implementation,

Microsoft Office integration, and mobile solution support. Forrester recommends that users select a vendor based on business requirements, architectural flexibility, and Total Economic Impact™ (TEI). In a report, Forrester interviewed the following 25 vendor companies: Agresso, CDC Software, Cincom Systems, Consona, Deltek, Epicor Software, Everest Software, Exact Software, Glovia International, IFS, Infor, Intacct, Intuit, Lawson, Microsoft Business Solutions, NetSuite, Oracle, ProfitKey International, QAD, Research In Motion, SAP, SoftBrands, SYSPRO, The Sage Group, and Workday. As main results for providing ERP for SMEs, they finally agreed on the role of competition for sustaining market share. The big vendors were trying to expand and raise their market share. For this, some of them provided ERPs even as a supplementary tool for sustaining or raising their markets.

The awareness about advantages of ERP

The history of ERP begins with the great organizations and business empires. But, in an attempt for receiving higher efficiency and productivity organizations were seeking the efficient ways for reducing costs and resources. For this, they invested on ERP systems. But, due to its high costs, the implementation of ERP initially was limited to great organizations and business empires. Also the need for sufficient infrastructures caused the ERPs limit to business empires. After a period of time, the big users reported high savings in the costs and control of resources using ERP systems. Also there were organizations that were seeking an agile human resource without considering the costs, for this ERP gradually penetrated more in SMEs and became very important in the process of competition.

The growth and advances in open source software.

Many of the authors consider open source software as a new revolutionary era in the development of software due its global economical impact and changing the nature of copy right. Today no one can ignore the role of these technologies in his/her professional and personal life. The organizations also are not exceptions. They're seeking more efficiency in investment and income and high capability in their resources. For these they tend to use ERPs. But, as we mentioned, because of the high costs and the necessities of closed-back ERPs they cannot use this type of software. They only use the open source software because they can improve to some extent, their functions.

The advancement in IT industry

"Our today life is a soft life" and this means that we obligatory need to use IT in our life. Also the organizations need to do this. As many authors [1, 2, 4, and7], the governance of IT in organizations is an obligation rather than a choice.

This is important to the extent that many resources contend that the organizations are passing from the IT era to the cyber era (Advanced IT) and in near future robot personnel and programmed human resources are the obligatory natures in the organizations. IT advancements caused the emergence of newer, cheaper and applicable software such as ERPs.

Challenges of implementing ERP applications and solutions

There is no magic in ERP software. ERP's benefits are a direct result of effective preparation and implementation, and appropriate use. Using ERP software will necessitate company to fit its business strategy with its information systems [6, 9, 13, and 21]. Many companies and enterprises used ERP applications, report success stories about the implementation of ERP applications [7]. The problems of getting ERP systems to work are well documented [2, 10, 11, 12] and there are many failures that have the resources needed to perform a careful planning and implementation [1, 2, 18].

Most organizations will encounter different kinds of challenges when implementing ERP systems. Unsuccessful implementation of ERP applications has caused many economic problems for SMEs. Implementation fail in Agilent Technologies Inc. in Mid-August of 2002 costs \$105 million in revenue and \$70 million in profits [15]. A-DEC Inc., a dental equipment maker located in Newberg, Oregon, installed Baan's ERP system to integrate manufacturing, distribution and financial information processing lost a lot of business because employees were falling behind on processing orders, building products, and shipping goods to dealers[16]. In 1999, a failed company-wide rollout installation of SAP AG's ERP applications caused Russ Berrie and Co. \$10.3 million [14].

Studies report that generally issues such as untrained staff [2], costs [2, 10 and 11], software selection failure [7, 11], customization problems [11], implementation strategy [6, 9, 13 and 21], incompatibility of software structure with business structure [1, 18], lack of implementation skills [2], and lack of sufficient and suitable information technology [2, 18] are the most challenging areas in the establishment and implementation of ERPs in SMEs.

Challenging areas of ERP implementation in SMBs (Small and Medium Businesses):

Lack out-of-the-box vertical requirements
Deployments often require expensive and extensive vertical customizations. Solutions that work for manufacturing processes often fails to do so for service-based processes and vice versa. Users often end up with customized solutions that are neither upgradeable nor extensible. SMBs face challenges in

supporting global business operations, related compliance issues, and localization preferences by industry.

Remain disconnected from other applications. Integration remains a significant challenge as SMBs seek to leverage existing investments in other applications. Rigid APIs, lack of interoperability standards, and nonexistent Web services increase the cost and complexity of the solution. When changes are made to the system, each integration point requires extensive and manual testing.

Discourage collaboration across new stakeholders. Existing systems were designed to support internal users in back-office functions. These functions often remain siloed. Suppliers, partners, customers, and front-office-facing employees do not have access to the system, and cannot update, modify, or create new information, products, and requests. Stakeholders lack access to basic information about tools such as ad hoc reporting and order status tracking.

Cannot keep up with a changing workfactor Most SMBs run on legacy environments that require memorization of shortcuts and codes in a “green-screen” environment. Existing applications impose a training burden given a younger, more transient workfactor accustomed to “point-and-click” environments.

Constrain business process flexibility. SMBs originally purchased ERP systems to take advantage of best practices provided out of the box. As these processes became commoditized, users sought differentiation, but the rigidity of the systems impeded easy creation of new processes by existing users, instead requiring expensive customizations.

Discussion:

A careful view of above economical expenses due to failure in implementing ERP programs, notes us about the degree of importance about both selecting and implementing ERP system. Thus, how can ERP function more effectively in S.M.E?

The troubles faced by SMEs with regards to ERP is quiet understandable. However they can be rectified. Even if they are not taken out totally there is always a scope for making things better and making ERPs more user friendly for Small and Medium Enterprises. The vendor's primary concern should be solving ERP problems in SMEs. This is emphasized because ERP problems in Small and medium enterprises are many [22]. Figure1 shows a step by step and careful plan of implementing ERP application [5].

Some of the suggestions that can be implemented in SMEs are as follows:

Structuring need based software programs

The main problem faced by S.M.E.'S when it comes to ERP is that their requirement is limited while the product offered exceeds their specifications in all ways (including the costs).The gap between these two needs to be analyzed by the companies and SMEs. It is not possible for the vendor to bring down their standards for the sake of the company neither is it feasible for the later to upgrade for the sake of the former (just for the sake of compliance and matching the company's model and that too without any direct monetary benefits.

A balance should be stricken between the two. The SME and the vendor should sit together and analyze the advantage and disadvantages of every possibility to match their requirements.

Resolving inherent defects in software programs

Software is not given due importance in many of the small and medium enterprises. Software is looked upon as just another operational tool. This will not have major impact at the immediate outset when it comes to other operations (though the loss will be known at a later point of time). However the case will not be the same with ERP.

The vendors experience great difficulty when it comes to installing ERP in such companies. They find themselves petrified to handle the resultant consequences because the companies might blame the vendor for the failure without realizing that it is due to their own inability/carelessness in maintaining software programs. That is why he must exercise care in solving ERP problems in SMEs.

The vendor needs to carefully review the software competencies in the company. This study will help him to asses what the company requires more in terms of software .To start with the vendors must initially speak to the in-house IT personnel. They should convey their observations very clearly. This will help them in disseminating the information all over the company and speaking to the decision making body. The senior management may have greater chances of accepting the vendors' suggestion when it is supported by IN house IT Company. The vendor should take all possible steps to remove the software deficiencies in the company before thinking of running the ERP application [23].

Defining a business strategy that will give you a competitive advantage or, at the very least, make you competitively equal. No amount of advanced information technology can offset the problem of a flawed business strategy and poorly performing business processes. This area, in particular, is something that ERP software implementers may not fully address because it can slow system deployment.

Acquiring flexible ERP information technology that can accommodate rapidly changing business

conditions is very helpful. The high-velocity flow of information needed to support action up and down the supply chain is a major step forward for most manufacturers. It will be mandatory in the future just to compete, much less stay ahead of, the competition.

Having the implementation led by a senior executive who has the authority to make changes happen and happen quickly. Make sure there is a sense of urgency and true accountability for completing preparation and implementation activities on time.

Conclusion:

SMEs are becoming the popular choice of ERP vendors. There is an increasing awareness of ERP in S.M.E. market. It has practically helped to unravel the myth that ERP is exclusively meant to business empires. ERP and S.M.E have become important part of enterprise studies.

This paper reviewed of the presence of ERP applications in SMEs, their subsequent challenges, and some suggestions for better introducing these applications in SMEs. It seems that In spite of the present economic scenario mandating SMEs to adopt packages driven by best practices and low risk high returns possibility to increase their productivity SMEs are reluctant to invest in an ERP package as they are not too sure about the following:

Implementation Time, Ease of usage by its Employees, Flexible for changes and of course Total cost of ownership. This paper paves the way for considering these issues and other related issues in preventing ERP implementation failure in SMEs.

In the case of our country, Iran, due to paucity of experiences in implementing ERP, we suggest organizations to follow Lau plan (figure2) to reduce program failure. It is also advantageous to train our staffs and aware those for the specific areas of implementing ERP include advantages and disadvantages, working procedures, related skills, cultural aspects, business processes and so on.

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