



ERP Implementations and its Major Challenges in Auditing Security Issues for SME

Gopikrishna Panda, Debasish Jena

Anup Kumar Samantaray

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Gopikrishna Panda

Asst. Professor, Regional College of Management,
Bhubaneswar – India

Debasish Jena

Asst. Professor, International Institute of Informational
Technology, Bhubaneswar – India

Anup Kumar Samantaray

Professor, Regional College of Management Autonomous,
Bhubaneswar – India

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ABSTRACT

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 S.M.E's (Small and Medium Enterprises) remained a mere dream. Enterprise Resource planning helps S.M.E.'s to enjoy unimaginable benefits. Nevertheless the problems of ERP in S.M.E.'s remain unsolved. There are still ups and downs in it. There are some problems for S.M.E.'s in the ERP market .They are not only from the addressed in the company's perspective but also in the vendor's perspective.

The troubles faced by S.M.E.'s 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 ERP's more user friendly for Small and Medium Enterprises. The vendor's primary concern should be solving ERP problems in S.M.E.'s. This is emphasized because ERP problems in Small and medium enterprises are many. However in this paper we extensively studied major implementation challenges and security issues pertaining to the implementation of ERP in various SME's.

INTRODUCTION

Enterprise Resource Planning (ERP) for small business calls for voluminous investments. The amount was fairly affordable to small business entities. There is no doubt or two say about its benefits. But the question that kept ringing in the market was can everyone afford it. The answer was a stubborn no initially but not anymore. ERP outsourcing, Open Source ERP's and ERP applications designed for S.M.E.'s (Small and medium Enterprises) have successfully overcome the above said limitations.

Enterprise Resource Planning (ERP) is an enterprise-wide information system designed to coordinate all the resources, information, and activities needed to complete business processes such as order fulfillment or billing. Many firms rely on ERP systems to implement business processes and integrate financial data across their value chains. This reliance increases the importance of ERP system security in protection of a firm's information assets. In recent years, the audit of ERP security has gained importance and

begun receiving an increasing percentage of firms' audit budgets. However, the audit of ERP security remains a complex, lengthy and costly task due to a confluence of factors.

DEMOGRAPHIC PRESENCE OF SME's

A total of 358 SMEs were contacted for the study. The demographic characteristics of the respondents were shown in **Figure-1**. We can find that as many as 39.4 per cent of SMEs were Sole Proprietorship, 10.9 per cent belongs to partnership and 49.7 per cent were companies. Majority of the respondents i.e. about 72.6 percent belongs to family business and 27.4 per cent of respondents belong to non-family business. If we industry area, out of total samples 12.60 percent belongs to City, 0.8 percent of respondents belongs to village area and 86.6 per cent belongs to village area. So the following factors influenced to implement the ERP systems in SME's.

STABILIZATION OF ERP IN S.M.E.s

SO they had to naturally look for greener and fresher pastures. S.M.E.'S was 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 S.M.E.'S 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. Hence ERP and S.M.E. was weighed on the same scale. Figure 1 shows the Portfolio Options for implementing ERP systems in enterprises.

IMPLEMENTATION PROBLEMS OF ERP IN S.M.E.'S

A. *Cost*

The small size of the companies proves to be another challenge to the vendor. Since there are too many S.M.E.'s in the market they demand a very low price from the vendor. It becomes practically impossible for the vendor to offer at such quotations as he would not even be guaranteed of a return in the costs. Small business erp is not expensive software but still requires lot of work.

Another issue is that there are a large number of companies in the segments and the vendors are few in numbers. Hence the former is able to exercise a considerable influence over the later. This issue also makes things difficult for the company. At times they have to comprise on quality due to unfair demands. There has been no full stop to this as the companies have failed to change their attitude in this regard.

The companies can definitely claim cost advantages due to the competition. But if they are bound to be unreasonable they cannot expect the vendor to deliver the best. They need to keep in mind that the vendors have come a long way after exploring their segment which was untouched for quite a long time. The companies are not able to avail the best business ERP small software due to these difficulties.

B. Choice

Companies have to exercise adequate care in choosing their ERP vendor and Small business ERP Software. This is a big dilemma for companies because they are unsure of choosing software offered by a branded player or a small player. That really makes no difference as long as the software and vendor suits all the requirements. Some companies debate that only a branded player can satisfy the requirements even though the recipient is a small concern. While the other argues that only small vendors are flexible when it comes to customizations. Each argument has its own merits and demerits. However companies tend to select the wrong option on the basis of these prejudices. As said earlier the companies need to take care of their requirements as the first priority before deciding on the software or vendor.

C. Customization

The bigger players have a trouble when it comes to offering solutions for S.M.E.'s. The level of customization and the work demanded by the S.M.E.'s some times appear to be too much for a bigger player. Moreover their businesses have always been focused to corporate giants. So when it comes to the question of S.M.E.'s it takes a great deal of time for them to understand the business and design software programs based on modality. Even if they are able to meet the requirements the companies always demand more. Branded and big vendors don't even yield to the first level and the software programs supplied by them prove to be of little use to the company. On the other hand companies also find that small ERP vendors are not competent enough to match the requirements of the companies. So they approach the bigger companies. Finally they land up in understanding that no one can help them to the desired extent.

D. Confidentiality

Big vendors don't even offer the source code when it comes to S.M.E.'s. This has resulted in lots of functional errors and the very purpose of ERP has been questioned by and large. On the other hand when it comes to the companies they hesitate to disclose confidential information because they are well aware of the fact that the vendors are limited, few and far between in the S.M.E.'s market. This means your vendor and the company's vendor could be one and the same. The apprehension of the companies look natural but it stops the vendor in restructuring the minutest detail in the software to match the company's needs for lack of adequate details.

A total of 421 SMEs were contacted for the study. The demographic characteristics of the respondents were shown in **Figure-2**. We can find that as many as 31.7 per cent of SMEs were Cost Concerned, 46.9 per cent are unsure of choosing or refining their IT setups , 70.9 per cent were or not aware of ERP and 98.6 per cent hesitate due to the vendors are limited or the confidentiality factors.

SUGGESTIONS THAT CAN BE IMPLEMENTED IN S.M.E's:

A. Structured 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 S.M.E.'s. 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 benefit). A balance should be stricken between the two. The company and the vendor should sit together and analyze the pros and cons of every possibility to match their requirements. Both of them should make compromises as and where possible. These adjustments even though may seem to be smaller will have greater impact when it comes to the structuring of software programs.

B. Rectifying 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 S.M.E.'s.

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 personnel but with a good faith and in the interests of the company. The vendor should take all possible steps to remove the software deficiencies in the company before thinking of running the ERP application.

C. Giving proper attention to ERP

The vendors have an advantage when it comes to working with bigger players. They realize the seriousness of ERP projects not only in terms of the money invested but also in the context of the restructuring and the supposedly redefined functions. This feature is absent in Small and Medium Enterprises.

They refuse to show importance as business process reengineering and change management looks like absurd to them. They underestimate the jargon and think it is too much keeping the size of their firm in mind. The ERP vendor needs to make them realize the importance in order to be successful in the project (for both of them).

MAJOR CHALLENGES IN AUDITING ERP SYSTEMS

ERP systems are inherently complex systems spanning many functional areas and processes along a firm's value chain. They are designed to provide flexible solutions to business problems. The sheer number of possibilities available for configuring an ERP system implies many potential security configurations. However, ERP systems pay little attention to potential conflicts and problems in those security configurations. Deployment and implementation of ERP systems also pay little attention to security implications, as the main purpose is to solve business problems within time and budget. In post implementation stages, auditors have access to rudimentary ERP tools and capabilities for auditing security configurations. There are also shortages of staff members trained in the ERP security.

Unfortunately, the increased enthusiasm on this subject has been met with complex and costly challenges. Many companies and audit firms are not yet prepared to tackle the need for a rigorous ERP security audit. Major challenges in auditing ERP Security are given as follows:

A. Complexity of ERP systems

Complexity of ERP systems leads to security vulnerabilities. ERP systems must be able to process a wide array of business transactions and implement a complex security mechanism that provides granular-level access to users. For example, in SAP R/3, hundreds of authorization objects are used to allow access to various actions in the system. A small or medium-sized organization may have 100 transactions that are commonly used, and each transaction typically requires at least two authorization objects. If the company has 200 end users who fill a total of 20 different roles and responsibilities, there are approximately 800,000 ($100 \times 2 \times 20 \times 200$) ways to configure security in the ERP- and this scenario excludes other complexity factors, such as multiple transactions sharing the same authorization objects, an authorization object having up to 10 fields that can be assigned to various values, and the possibility of using position-based security. The point

of this illustration is that the inherent complexity of an ERP system increases the complexity of security configurations and leads to potential security vulnerabilities. Flaws, errors and Segregation-Of-Duty (SOD) conflicts become more likely. Consider a scenario in which a security administrator has to grant read-only access to transaction X, which requires him/her to assign 10 authorization objects to the role. At a later point in time, management decides to grant write access to transaction Y, which implies assigning five more authorization objects. One of the objects is common to both transactions and determines the write capability. Although these two changes are seemingly independent, due to the shared authorization object granting write privileges, the unintended consequence is a potential SOD conflict. An ERP system does not automatically check for these kinds of security vulnerabilities. Unless the security administrator is well trained and employs rigorous positive and negative testing, he/she is likely to miss the unintended consequence of allowing write access to both transactions X and Y. As the number of potential configurations and authorization objects increases, it becomes increasingly difficult and costly to analyze the security implications of ERP configurations, such as the unintentional creation of SOD conflicts.

B. Lack of ERP Tools

ERP tools for security audit are inadequate. Most of the security tools available in ERP packages are not designed to facilitate efficient and effective audit of ERP security. The main emphasis of ERP tools is on security configuration and maintenance. Recently, there has been an increase in the number of third-party product offerings assisting with ERP security and SOD reviews. However, many users complain that those tools often generate false positives and create more work for auditors.

C. Customization of ERP Systems

The customization of ERP systems to firms inhibits the development of standardized security solutions. Every ERP implementation contains some level of customization specific to the firm undertaking the implementation. However, customization makes it difficult to develop a standard approach or methodology for conducting ERP security audits.

D. Manpower

There is a shortage of manpower trained in ERP security. Most ERP training programs are designed for implementation efforts. They offer very little on ERP security and audit. Thus, there is a shortage of auditors who are trained in ERP security.

E. Inadequate attention towards security

Implementers pay inadequate attention to ERP security during deployment. Many companies do not pay adequate attention to security implications of ERP configurations during the deployment and implementation of ERP systems. Implementation teams are usually tasked with finishing the implementation projects on time and within budget. They do not pay adequate attention to security implications since it increases implementation time and budget. Due to limited emphasis on security implications, ERP security becomes too lax, making post implementation problem identification and remediation very costly.

F. Conventional Approach

Most ERP security audits today are performed using a manual approach. There is little automation beyond the use of native tools that come standard with ERP packages. Unfortunately, the bottleneck of the manual approach is the limitation of the native security reporting tools found in most ERP products. These native tools are not designed to facilitate a large-scale audit effort, but rather to help security administrators perform occasional validation of the accuracy of security configuration. They allow reporting on only a single transaction per query, which may be adequate for a security administrator who works full time and handles each transaction request individually; however, it is not as practical for an IT auditor who is expected to perform the audit in a limited period of time and must test a large number of transactions. Although some IT auditors are able to utilize technology to perform this process more efficiently than others, as long as the process is based on the same philosophy of manual extraction followed by analysis, it continues to be an incredibly tedious and time-consuming task. The manual method is also prone to human errors.

The **Figure 3** indicates the factors influencing the major challenges in auditing ERP system in SME's are serious.

CONCLUSION & SCOPE OF FUTURE WORK

- S.M.E.'s market still continues to be a "bed of opportunities" for ERP Vendor in spite of the above mentioned drawbacks. Equally promising is the demand for ERP from Small and Medium enterprises. Some proposal should be put forward for the welfare of both parties to counter the problem of ERP in S.M.E.'s.
- S.M.E.'s 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.
- Unless the ERP vendor and the company sits together to resolve the conflicts it is not going to be beneficial to either of them. The onus of initiating lies with the vendor when it comes to ERP problems in small and medium enterprises. Since

- he has the required expertise he needs to take the lead in convincing the company and be sure of Solving ERP problems in S.M.E.'s.
- ERP is recognized as an effective tool which supports most of the business systems that maintain the data needed for a variety of business functions such as Manufacturing, Supply Chain Management, Financials, Projects, Human Resources and Customer Relationship Management in a single database. On the other hand, auditing of ERP security is also a demanding area which requires proper attention. Though many steps have already been taken by various researchers world wide, but for smooth and efficient functioning of business tasks in a better manner, there is still a need of many more initiatives to be taken in this direction.

Figures and Tables

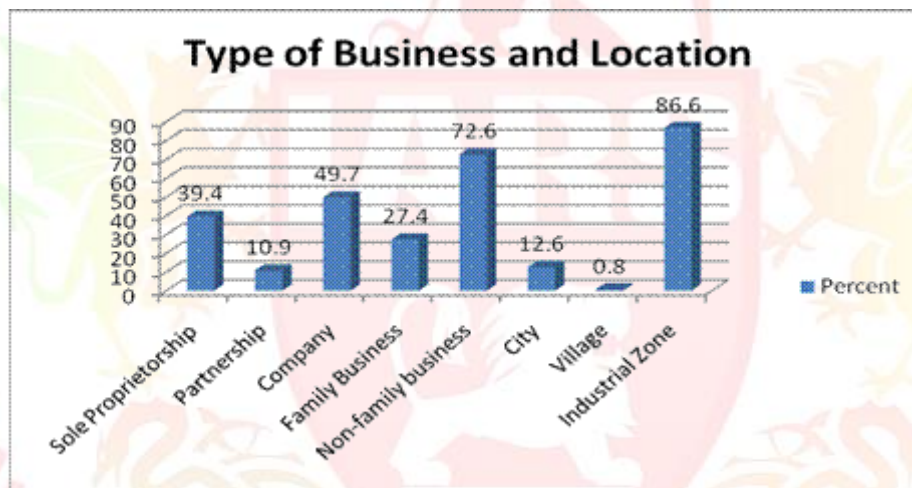


Figure 1: Type of Business and Location

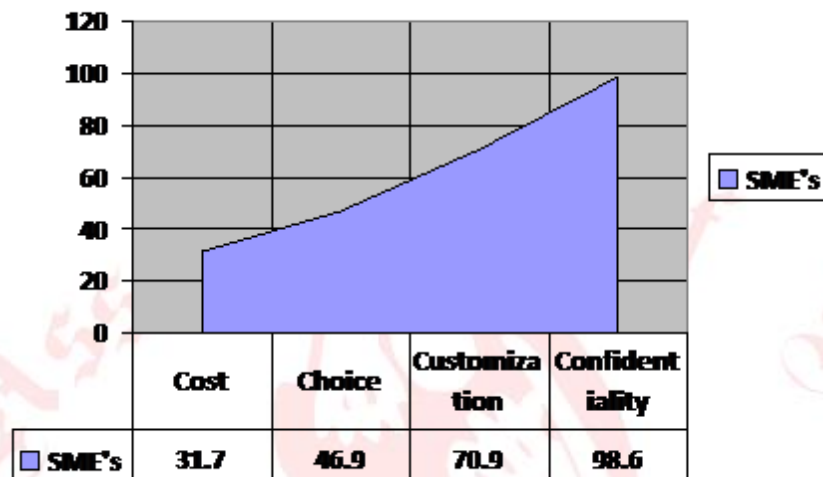


Figure 2: The factors for implementing ERP in SME's

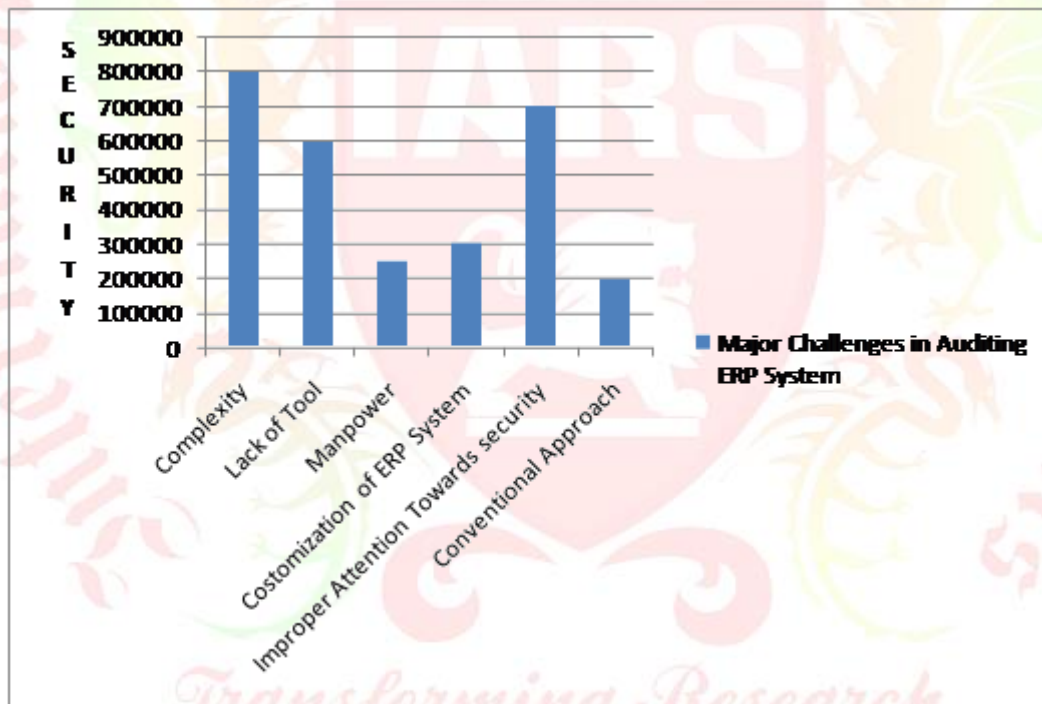


Figure 3: Major Challenges in Auditing ERP Systems

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