

Reasons for ERP Adoption by SMEs: An Empirical Study

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Abstract

It is a known fact that large enterprizes (LEs) across the world have adopted Enterprize Resource Planning (ERP) systems to meet the challenges of a dynamic market scenario. Small and Medium Enterprizes (SMEs) are not insulated from the effects of globalization and are also adopting ERP systems to help them cope with the rapid changes. In the last few years, there has been a surge in ERP adoption by SMEs.

In the past, researchers have tried to understand the reasons for ERP adoption amongst SMEs the world over. Literature points to the fact that SMEs adopt an ERP system driven by external influence and not internal need. They seldom think through their decision with care. In this paper, the author has made an attempt to understand the reasons for ERP adoption amongst Indian SMEs via an empirical study.

Keywords: *Enterprize Resource Planning (ERP), Adoption, Small and Medium Enterprizes (SMEs)*

Introduction

An Enterprise Resource Planning (ERP) System is a packaged business software system that lets a company automate and integrate majority of its business processes, share common data and practices across the enterprise and access information in a real-time environment (Deloitte Consulting, 1999). ERP systems have been widely adopted by large enterprises to help them cope with the challenges of the global market place (Oliver and Romm, 2000).

Adopting and implementing an ERP system is a lengthy and costly process requiring investment in software and related services such as consulting, training and system integration. Often, the ERP project is the biggest project an organization plans for. Hence it is imperative to select an ERP system with care, successfully implement and use it if it is to benefit an organization (Markus et al., 2000). While large enterprises are well equipped to handle a project of this scale, SMEs may not be due to the resource poverty that characterizes them (Levy and Powell, 2000).

Small and Medium Enterprises (SMEs) are not insulated from the effects of globalization and are increasingly adopting ERP systems to respond quickly to the dynamic market scenario (Everdingen et al., 2000; Gable and Stewart, 1999; Greenemeier, 2001). Over the last few years, there has been an increase in the number of Enterprise Resource Planning (ERP) implementations in Small and Medium Enterprises across the world (Haddara and Zach, 2011).

While ERP system adoption by SMEs is on the rise, researchers have been keen on understanding the reasons for adoption. Extant literature reveals that the reasons for ERP system adoption in SMEs is driven by exogenous reasons rather than business related factors, as is the case in large companies (Buonanno et al., 2005). While some SMEs decide to acquire a particular ERP solely because their competitor has done so, others take the decision because a consultant advised them to.

The awareness amongst SMEs for ERP is very low. They have limited expertise in IT and very few know how they can benefit from an ERP system, or, if it is right for them (Levy and Powell, 2000; Tiwari, 2014). Thus, most ERP decisions are taken without proper consideration and without aligning ERP with business goals. This oft times results in a system that meets but part of a company's requirements.

With this background, the author tries to understand the approach to ERP system adoption by SMEs via an empirical study. This study aims to add to the discussion on the reasons why SMEs in India decide to adopt an ERP system. With the view that SMEs are heterogeneous and not homogeneous as assumed by researchers, the author tries to establish if small and medium enterprises differ in the reasons for ERP system adoption.

This paper is organized as follows. In section 2, the theoretical background to the study and the research questions are presented. Section 3 describes the research methodology, while section 4 presents the analysis and

results. Section 5 discusses the results of the study and the paper ends with the conclusion and avenues for future research.

Theoretical Background and Research Questions

SMEs are very different from their larger counterparts. Due to limited access to resources like skills, time and money (Welsh and White, 1981), they are ill-equipped to face the turbulence in the market place. They are unwilling to allocate their limited resources to an ERP project as it is expensive and takes a lot of time (Chan, 1999). Thus, adoption of information systems and in particular ERP systems represents a greater risk and resource commitment for SMEs when compared to their larger counterparts (Cragg and King, 1993; Mabert et al., 2000; Thong, 2001; Welsh and White, 1981).

This resource poverty that characterizes SMEs, coupled with a lack of knowledge has been found to impede IT adoption (Baker, 1987; Cragg and Zinatelli, 1995; Proudlock et al., 1999) and to negatively impact Information System (IS) implementation success and growth (Cragg and King, 1993) in SMEs. The skills needed for IS planning and organization are very limited in SMEs (Levy and Powell, 2000). SMEs' decision making about IS has been described often to be reactive instead of proactive, informal and intuitive with a day-to-day focus (Proudlock et al., 1999).

Majority of the extant literature in the area of ERP is focused on implementation and the problems and issues surrounding it (Esteves and Pastor, 2001; Verville, 2000).

A lot of research has gone into determining the critical success factors for implementation of an ERP system (Al-Mashari et al., 2003; Akkermans and Van Helden, 2002, Nah et al., 2001; Bingi et al., 1999; Holland and Light, 1999). Some studies have also paid attention to ERP adoption. Majority of these studies have focused on large enterprises.

In the last few years, there has been a spurt in the number of ERP system implementations at SMEs in India and abroad. ERP adoption by SMEs is being fuelled by several factors. Prior to globalization, the operations of SMEs were restricted to local markets. But today, owing to web-based technologies and community networks their arena has widened. They are no longer insulated from the effects of globalization. Therefore, it is imperative for them to continuously improve their competitiveness and assert themselves in the global market place (Shehab et al., 2004).

In addition to this, ERP vendors have shifted their attention to SMEs because of the saturation of the ERP market for large enterprises (Everdingen et al., 2000; Gable and Stewart, 1999). Vendors have introduced simplified and cheaper ERP solutions tailored to meet SME requirements. At the same time, SMEs' need for integration of information systems and the availability of cheaper hardware and software (Gable and Stewart, 1999), have encouraged them to adopt ERP systems.

Though SMEs have been implementing ERP systems, they are not faring as well as their larger counterparts and are unable to achieve their goal of overall improvement (Sun et al., 2005). This has been of interest to industry experts and academicians. Several studies have been taken up to understand how SMEs implement an ERP system (Bernroider and Koch, 2001; Buonanno et al., 2005; Everdingen et al., 2000; Gable et al., 1999; Haddara and Zach, 2011; Koh and Simpson, 2004; Loh and Koh, 2004; Tagliavini et al., 2002). Some researchers have studied the reasons for ERP adoption by SMEs (Buonanno et al., 2005; Gable and Stewart, 1999; Oliver and Romm, 1999; Raymond et al., 2007; Tagliavini et al., 2002).

While ERP systems are being adopted by large and small enterprises, the reasons for adoption differ significantly. Some of the reasons why large enterprises want to implement an ERP would be to avoid duplication of data entry, integration of departments and locations and streamlining business processes (Buonanno et al., 2005). Many organizations may also implement ERP to meet their regulatory compliance requirements. Most large enterprises adopt an ERP system based on a careful study, which establishes the need for an ERP system. This is not the case with SMEs.

Extant literature reveals that most SMEs adopt IT or an ERP system owing mainly to external pressure and that they are not knowledgeable about ERP (Premkumar and Roberts, 1999; Mehtens et al., 2001). Harindranath et al. (2007) share that most SMEs in England are largely unaware of existing policy instruments designed to help them in the adoption

and use of ICT. In India, awareness about ERP amongst SMEs is less than 35% whereas over 80% of large enterprises are aware of it (Tiwari, 2014).

While some SMEs decide to adopt an ERP system owing to pressure from their customers, others take the decision because their competitor has done so. Tagliavini et al. (2002) did a study on 79 Italian SMEs and concluded that SMEs adopt ERP solutions mostly for contingency, exogenous reasons rather than due to an accurate analysis of their need.

Buonanno et al. (2005) performed a comparative analysis between SMEs and large companies with regard to factors affecting ERP adoption. The analysis of the empirical data showed that companies do not seem to be regarding ERP systems as an answer to their business complexity. They reported that the decision process regarding the adoption of ERP systems within SMEs is affected by exogenous reasons or “opportunity of the moment” than business-related factors, contrary to large companies that are more interested in managing process integration and data redundancy/in consistency through ERP implementation.

In 2005, Laukkanen et al. undertook a study to investigate the relationship of enterprise size to the constraints and objectives of Enterprise Resource Planning (ERP) systems adoption in Finland. Their findings suggest that smaller companies, on account of their size, experience a greater level of knowledge constraint than LEs. They also reported

that Business development was the most prevalent objective for ERP adoption amongst organizations, more so the large and medium sized companies.

A study conducted on a range of ERP issues among 136 executives at SMEs indicated that ERP decisions are often forced on senior IT executives. For majority of the respondents (61%), external pressures factored prominently in the decision to implement ERP (Thornton May, 2007). Some of the other reasons for deciding to implement ERP are pressure from suppliers, business associates, industry experts and consultant advice. Based on all of the above, this study raises a few research questions and they are addressed next.

Based on the literature reviewed, it was understood that SMEs decide to implement an ERP system owing mainly to pressure from external entities like competitors, customers, suppliers, business associates, industry experts and consultants. This was in contrast to the reasons that LEs adopt ERP namely the need to achieve integration, streamlining business processes or better inventory control.

It was also observed that researchers treat SMEs to be a homogeneous group whereas they are heterogeneous. This research considers small and medium enterprises to be different and tries to understand if the reasons for adoption are different for small and medium enterprises.

Considering the above, the following research questions were raised:

Research Question 1: *Do SMEs decide to implement an ERP system owing more to pressure from external entities than due to internal reasons and requirements?*

Research question 2: *Do small and medium enterprises differ in the reasons for ERP adoption?*

Research Methodology

This study was part of a larger study undertaken to understand ERP system implementation at SMEs. For this study, ERP implementations at 6 SMEs were closely followed from start to finish. Based on the findings of the study of ERP implementation at 6 SMEs and from the literature reviewed, a questionnaire was designed to address several managerial issues pertaining to ERP system adoption, evaluation, selection and implementation. It was pilot tested at the six SMEs to see if the instrument provided accurate and consistent information. Experts in the area further validated it. The validity was established using content and face validity techniques. The instrument was improved upon based on the feedback received from the experts before being hosted online on www.SurveyMonkey.com.

For this particular study, the questions were pertaining to the reasons for ERP system adoption. The reasons were categorized into external and internal. The internal factors were to avoid duplication of data entry, for integration, to streamline business processes, for better inventory

control, to eliminate obsolete hardware and for the need to meet regulatory compliance requirements. The external factors were pressure from external entities like competitors, customers, suppliers, business associates, industry experts, consultants etc.

From literature, it is evident that there are many definitions for a SME. For this study, SMEs who fit the definition of a SME as per the Ministry of Micro, Small and Medium Enterprises (MSME) bill of 2006 (defined in the operational definitions section in table 1) were chosen.

The CEOs or IT Managers at 304 companies chosen from the Confederation of Indian Industry (CII) member directory for Karnataka (2009, this used the definition of a SME based on the MSME bill of 2006) and ERP vendor websites, were contacted to ascertain if they had implemented a packaged ERP system and would participate in this study. Of these, 150 SMEs consented to participate in the survey and a link to the online questionnaire and a covering letter were then mailed to them. Majority of the respondents chose to answer the questions via an interview as opposed to filling the online questionnaire. During the period of one year (2010) 54 responses were obtained, which corresponds to a 36% response rate. The data thus collected was analyzed using SPSS 13.0 and MS-Excel 2007.

Operational Definitions of Terms Used in the Study

Table 1: Definition of Terms

Term	Operational Definition
Enterprise Resource Planning System (ERPS)	For this study, an ERP system is defined as a packaged solution that allows for integration of various functions in an organization.
SME (Definition given by the Ministry of Small and Medium scale Enterprises Bill, 2006)	<p>For the manufacturing sector,</p> <ul style="list-style-type: none"> • A small enterprise: Investment in plant and machinery is more than Rs. 2.5 million but less than Rs. 50 million • A medium enterprise: Investment in plant and machinery is more than Rs. 50 million but less than Rs. 100 million. <p>For the service sector,</p> <ul style="list-style-type: none"> • A small enterprise: Investment in equipment is more than Rs. 1 million, but less than Rs. 20 million. • A medium enterprise: Investment in equipment is more than Rs. 20 million but less than Rs. 50 million.

Data Analysis

The data obtained from 54 SMEs across Karnataka in India was subjected to relevant statistical tests to test the propositions. Some of the statistical techniques employed in the present investigation are descriptive statistics, paired sample t-test and contingency coefficient test. The paired sample t-test has been used to test the difference between internal and external factors that drive ERP adoption as perceived by small and medium enterprises. Contingency Coefficient test was employed to measure the association between small and medium enterprises and their responses on selected parameters, which are reasons for ERP adoption, by SMEs.

Demographic Profile of Respondents

The sample comprised of 54 companies from the manufacturing sector of which 44% (24) were small and 56% (30) were medium sized enterprises (as seen in table 2). Nearly 60% of the respondents had an IT department with 2 to 5 people, 9.3% had one person and 18.5% of them did not have even a single person to man their IT function.

Of the respondents, 69% were the main organizations themselves or the head office, 26% were subsidiaries of a larger group and the remaining 5% were branch/local/regional offices as shown in table 2.

Table 2: Scale, Strength of IT Department and Type of Company

Scale	Frequency	Percent
Small	24	44.4
Medium	30	55.6
Strength of the IT Department	Frequency	Percent
Nil	10	18.5
1	5	9.3
2-5	32	59.3
5-10	6	11.1
>10	1	1.9
Type of Company	Frequency	Percent
A branch/local/regional office of another organization	3	5.6
Subsidiary of a larger group	14	25.9
Main organization/Head office	37	68.5

(Source: Survey by the author)

Analysis and Results

The reasons for ERP system adoption were categorized, as explained earlier, into external and internal factors. The results are displayed in table 3.

Table 3: Reasons for ERP System Adoption

Internal/ External	Reasons	Yes/ No	Frequency	Percent
Internal	We wanted to avoid duplication of data entry.	Yes	36	66.7
	We needed to integrate the various departments and locations.	Yes	53	98.1
	We wanted to streamline business operations.	Yes	42	77.8
	We wanted better inventory control.	Yes	13	24.1
	We wanted to eliminate obsolete hardware and software practices.	Yes	3	5.6
	We wanted a system that would support our regulatory compliance requirements.	Yes	23	42.6
External	Our parent company decided that we should implement ERP.	Yes	6	11.1
	Our competitors had implemented an ERP system and hence we decided to do so too.	No	54	100.0
	Our customer required us to implement ERP.	No	54	100.0
	We were under pressure from our suppliers to implement ERP.	No	54	100.0
	Our business associates/ peers within the sector recommended we implement ERP.	Yes	2	3.7
	A consultant advised that we implement ERP.	No	54	100.0

284 (Source: Survey by the author)

From table 3, it can be noted that amongst the internal reasons, majority of the respondents (98.1%) chose the need to integrate various departments and locations as the foremost reason to adopt ERP followed by the need to streamline business operations (77.8%). Only 24.1% of SMEs said they adopted ERP for better inventory control and a mere 5.6% of them did it to eliminate obsolete hardware and software practices.

Amongst external factors, SMEs did not cite pressure from competitors, customers, or suppliers, or advice from industry experts & consultants. A mere 3.7% of SMEs said that they implemented an ERP system on the recommendation of their peers.

Table 4: Reasons for ERP System Adoption - Paired Samples Statistics

Factor		Mean	Std. Deviation	Mean Difference	T	P
Pair 1	INT	3.1481	.99825	3.0000	20.383	.0001
	EXT	.1481	.40782			

(Source: Survey by the author)

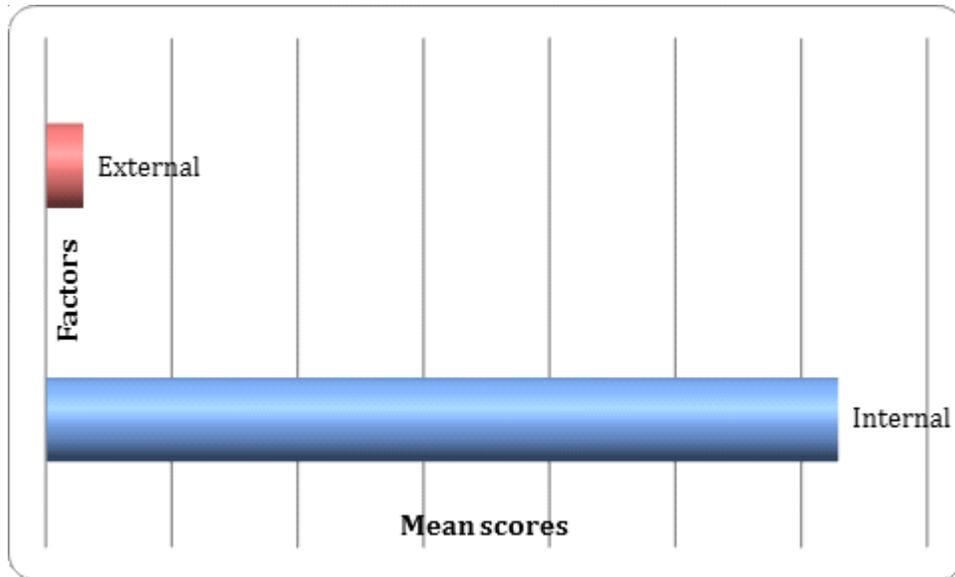


Figure 1: Reasons for ERP System Adoption - Paired Samples Statistics

(Source: Table 4)

From table 3, it can be noted that SMEs decide to implement an ERP system owing more to internal reasons than external reasons. This is true as the % of 'Yes's' for internal factors is more and the % of 'No's' is less. In addition, from paired samples t-test (table 4, figure 1), the mean for internal factors (3.1481) is higher than that of external factors (0.1481). Thus, we can conclude that internal factors like need to integrate various departments and locations drive ERP adoption more than external factors.

The study tried to establish if small and medium enterprises differed from each other in their reasons for ERP system adoption given that they are very different.

From table 5, it is observed that the results show no significant difference in drivers for ERP adoption between small and medium enterprises except for one factor (p value=0.019), namely the need to support their regulatory compliance requirements. While 56.7% medium enterprises said this factor was one of the key drivers for ERP, 75% of small enterprises did not choose this factor.

Table 5: Reasons for ERP System Adoption – Difference between small and medium enterprises

Internal/ External	Factors		Scale		Total	CC	P
			Small	Medium			
Internal	We wanted to avoid duplication of data entry.	F	17	19	36	.079	.561
		%	70.8	63.3	66.7		
	We needed to integrate the various departments and locations	F	23	30	53	.152	.259
		%	95.8	100.0	98.1		
	We wanted to streamline business operations	F	18	24	42	.060	.661
		%	75.0	80.0	77.8		
	We wanted better inventory control.	F	8	5	13	.190	.155
		%	33.3	16.7	24.1		
	We wanted to eliminate obsolete hardware and software practices.	F	2	1	3	.108	.425
		%	8.3	3.3	5.6		
	We wanted a system that would support our regulatory compliance requirements.	F	6	17	23	.303	.019
		%	25.0	56.7	42.6		
External	Our parent company decided that we should implement ERP.	F	2	4	6	.079	.561
		%	8.3	13.3	11.1		
	Our business associates/ peers within the sector recommended we implement ERP.	F	2	0	2	.214	.107
		%	8.3	.0	3.7		

(Source: Survey by the author)

Table 6: Reasons for ERP System Adoption – Difference between small and medium enterprises

Size	Factor			
	Internal		External	
	Mean	Std. Deviation	Mean	Std. Deviation
Small	3.08	1.10	.16	.48
Medium	3.20	.92	.13	.34
Total	3.14	.99	.14	.40

(Source: Survey by the author)

From table 6, it can be noted that the mean for internal factors is high and that for external factors is low for both small and medium enterprises. Thus, we can conclude that SMEs decide to implement an ERP owing more to internal reasons (to avoid duplication of data entry, integration, streamline business processes, better inventory control etc.) than due to pressure from external entities (competitors, customers, suppliers, business associates, industry experts, consultants). The drivers for ERP are the same irrespective of the scale.

Discussion

The results of this study reveal that SMEs decide to implement an ERP owing more to internal reasons than due to pressure from external entities as is pointed to in literature. The major reasons quoted for ERP adoption were:

- The need to integrate various departments and locations (98.1%)
- The need to streamline business operations (77.8%) and
- To avoid duplication of data entry (66.7%)

Only 24.1% of SMEs said they adopted ERP for better inventory control and a mere 5.6% of them did it to eliminate obsolete hardware and software practices. None of the external factors of pressure from external sources like competitor, consultant, peers etc. were significant. It is important to raise the question here that could there be a possibility that the respondents were trying to justify their large purchase decision.

This study reveals that SMEs are internally driven and choose to implement an ERP package mainly due to the need to integrate various departments and locations. They do not choose to implement an ERP package due to pressure from external entities like their competitors alone as pointed to in literature. Thus, as in case of large enterprises, there is evidence that SMEs too consider business related reasons for ERP adoption (Buonanno et.al., 2005).

The study also revealed that the reasons for ERP adoption by small and medium enterprises do not differ. Though small and medium enterprises are believed to be heterogeneous, in this study no major differences emerged in the reasons for ERP adoption.

It was also observed that nearly 28% of the SMEs had an IT department with one person or none at all. SMEs do not have a strong IT team. This often becomes a deterrent to ERP adoption and use. Thus, it is important for SMEs to strengthen their IT team to enable them to reduce their dependence on external sources like consultants.

Conclusion

The objective of this study was to understand the reasons for ERP adoption amongst SMEs in India and establish if small and medium enterprises differ in their reasons for ERP adoption. The results of this study indicate that there is some evidence that SMEs adopt an ERP system due to internal needs and not solely due to external pressure as reported in earlier literature. Integration of various departments and functions was quoted as the top reason for ERP system adoption.

Thus, there is some evidence that SMEs are driven by internal reasons and adopt ERP due to their need. This suggests that SMEs do not necessarily adopt an ERP system due to exogenous reasons or an opportunity of the moment alone but due to business related factors. The study also revealed that small and medium enterprises do not significantly differ in their reasons for ERP system adoption.

Since SMEs are major contributors to the economy of a country, it is important for future research to focus on ERP implementation at SMEs and help SMEs to understand the requirements for a successful ERP implementation. This study was limited to the manufacturing sector as the respondents are manufacturing units across Karnataka and hence the study cannot be generalized to other sectors. It is imperative that future studies seek responses from across all sectors and also consider a larger sample.

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