

INTEGRATING CLOUD COMPUTING TO SOLVE ERP COST CHALLENGE

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ABSTRACT

Enterprise Resource Planning (ERP) is a popular business management tool used by almost all companies these days to organize their business. In spite of the challenges faced by ERP; before, during and after its implementation into the Enterprise, it fetches greater profits to the organization. This paper deals with the challenges faced by ERP with a complete literature overview of the challenges from earlier authors. Then after a brief visit of these factors, a very essential topic to the Enterprises i.e., Costs are discussed. The costs that are incurred in the project, some unknown or hidden costs are dealt with. A solution is proposed to solve this cost problem of ERP and to improve the profit margins to the companies. The solution is Cloud ERP. The latter part deals with the benefits of Cloud ERP in general and with respect to costs along with the concerns of cloud ERP, the major issue among all the concerns and few proposed solutions of solving this problem in the cloud ERP.

KEYWORDS

ERP, Cost, Cloud ERP, Security

1. INTRODUCTION

ERP (Enterprise Resource Planning) is a bunch of modules that form a suite to support the business activities of an Enterprise or an organization. It plays a very crucial role in the profit gains and the maintenance of standards in any organization. In the initial stages of ERP, it was all on-premise which means that the company or the organization has to bear the cost of infrastructure, hardware, electrical equipment, systems, and employees to manage them to house an on-premise ERP. Along with all these, there were many potential challenges of ERP in an Enterprise. Our paper discusses very briefly in section 3 all the challenges of ERP by performing an overview on existing literature work (section 2) on the factors affecting ERP and the crucial factor of ERP for any company – Costs is discussed. We talk on the budget, the hidden and underestimated costs and the mistakes that give rise to such costs. A small case study is provided to show how the budget problem can affect a project and can create havoc to it. In section 4, we discuss the best possible solution to the cost problem, its benefits, concerns and other details relating to it. This solution is Cloud ERP and we discuss in detail about the benefits and concerns of it. Section 5 discusses the workflow of the research. Section 6 concludes the work with a proposal on future work.

2. RELATED WORK

Implementing ERP is a very challenging task. It has many factors that affect it. Most of these factors have been discussed by many authors in their literature. In this section of the paper, let us look in detail what all the authors have in their work about the factors affecting ERP. Parijat and

Pranab said that the factors of ERP are business process restructuring, change management, users' attitude, training, project management, top management support, vendor support, project sponsorship (budget) and proper communication [4]. In [5], the authors mentioned some other general factors as inadequate clients' willingness to participate, need for vast clients and relevant personnel involved [6], too broad coverage of business, lacking clear targets, shortage of support and experience, technological or cost-profit problems. Inadequate training, not enough experts, lacking analysis of flow and technology, failure of synergizing inside and outside expertise, [8] business plans incompatible with ERP functions, and separation from certain ready systems are risk factors for the success of ERP. The major challenges of ERP implementation in Business [11] [19] are Lack of senior management commitment, [20] ineffective communication with users, insufficient training of end-users, failure to get user support, [16] lack of effective project management [11] methodology, [12] [13] underestimating the legacy systems, conflict between the user departments, composition of project team members, change management, training to users, communication, failure to redesign business processes and the misunderstandings of change requirements. For an ERP project to succeed, you must prevent problems in the following high-priority areas which [14] are e-business strategy, project management approaches, complex technology and systems, and [17] End-user resistance.

Process knowledge, customization and contextualization knowledge, management support, change management, and training have been identified as key components of this dimension [15] [21]. The major success factors of an ERP system are [3] [9] top-management support, training [15], team contributions, consulting capability, and support. Employee skills [18] and project knowledge [21] play an important role in the success of any project. Employees should be well trained in using the system and be fully aware of the system's advantages and capabilities. Technical competence factors do play a very important role in the ERP system. [24] The implementation team should have the ability to implement, [23] maintain and upgrade the ERP system, actively builds relationships with business managers [22], responsive to the endusers and check for proper data integrity.

As mentioned in [18] ERP should be a well-planned and accurate budget covering all the costs needed [15] in terms of training certificates, employees' motivations, system upgrades in the post-implementation phase, and any costs due to recruitment and training of new staff to replace those leaving and to cope with potential increases in turnover[23]. ERP systems simply can't handle complex transactions and therefore limit the success of channel partners, negatively impact margins, and ultimately hurt the bottom line. Legacy systems proper planning, softwareselection efforts and information-system area participation [1] [3].

All these challenges can be broadly categorized into 4: Employee Skills (Both Technical and Non-Technical), Change Management, Costs, and Other IT factors

3. CHALLENGE IN FOCUS – COSTS

The ultimate goal of any enterprise is profits which are the result of the whole revenue generated taking out the costs incurred. The profits will be more when the costs are less. Let us now discuss One of the important challenges of ERP are 'Costs'. ERP software initiatives are complex, multifaceted undertakings making the budgeting process is one of the trickiest stages of implementation. [15] Cost is a very important factor for ERP projects. Generally, if we take 100% as our total budget for the ERP project, the hidden and unexpected costs would come up to 10% of the total estimate [27]. There are few factors that determine the ERP implementation cost such as the size of the Company, cost-involving implementation, third-party software Integration, ERP system customization, and brand factor.

While the most expensive ERP system will probably meet all or most of your company's requirements, the TCO (Total Cost of ownership) may far exceed the corporate budget. On the other hand, there can be both functionality and implementation risks associated with selecting the least expensive ERP solution.

3.1 Hidden/ Underestimated Costs

The Hidden or underestimated costs of ERP projects can be any of the following: training, unanticipated customizations, data conversion into different formats, integration and testing, data migration from legacy systems, data analysis, consultants and Infinitum, replacing the best and the brightest people, process redesign and software upgrades. All these form most of the hidden and underestimated costs of an ERP project. These are not direct and are not all the time unaware.

3.2 Mistakes that Increase the costs

There are a few mistakes that cause the project to move into over-budget. They are: improper requirements gathering, underestimating potential hidden costs, failing to buy in from the top management, frequent changing of processes to meet software's needs, over-estimating the ability to customize the system, failing to select the right person-incharge, doing too much at once, under-staffing the project, giving Inadequate training to the users and not expecting the unexpected. All these mistakes lead to more costs on an on-premise ERP. Many solutions are proposed to solve this problem of costs but only a few of them are practically feasible.

3.3 Example Case-study

While implementing an ERP system for the US Navy, the 2005 budget request for the Navy was \$3.5 billion for business systems operations and upgrades, and it does include ERP. The Navy estimates the ERP will not be fully operational until 2011 at an estimated cost of \$800 million. But the individual Program Managers for each of the pilots reported the following total costs of their pilot through September 2004 as \$1,044,300,000. The \$1 billion spent on the pilots was a waste. The best solution to the cost problem proposed so far is 'Cloud ERP' which means moving the ERP from onpremise to cloud so that all the resources are shared along with the products and services in the cloud [29].

4. CLOUD ERP

Cloud ERP is an approach to enterprise resource planning (ERP) that makes use of cloud computing platforms and services to provide a business with a more flexible business process transformation [30]. The shift to cloud-based software is being fuelled by a number of factors, including virtualization (creation of a software layer between existing computer hardware and host operating systems), which enables shared use of servers, reducing the cost of IT infrastructure and support. In addition, organizations want to adopt the latest technologies quickly to remain competitive, and increasing complexity of IT support requirements for business management applications.

4.1 Benefits of Cloud-ERP:

Movement of ERP to the cloud is new but the benefits can be reaped both from the Cloud and ERP perspectives. It gives a double advantage of using Cloud ERP. The benefits of cloud ERP can be summed up as: reduction in capital and operational costs. ensures latest updates or versions, without the necessity of companies to be involved, perfect fit for new start-ups, even if they think of going public someday, access of information throughout the globe, ease of

maintenance and ensure regular compliance, reduction in IT staffers, procurement and configuration of servers, enhanced system speed and performance, trial applications without a large capital investment and roll out new applications to groups reducing risk and spreading training costs, and can adjust users and applications up or down to meet the changing demands of your business and enhanced mobility. In most cases, cloud computing is more secure than an organization's data warehouse, businesses can focus more on their people and facilities rather than on providing infrastructure business continuity and provides an opportunity to re-architect our systems that will support new world applications

4.2 Cost cuttings through Cloud ERP:

Cloud ERP is more beneficial to save the costs for the ERP project. Some of the cost cuttings through Cloud ERP are: reduction in capital and operational costs, reduction in maintenance costs, reduction in investment and ownership costs, elimination of IT/ERP infrastructure facilities for user companies, lower Total Cost of Ownership (TCO), reduction in Resource costs due to sharing and less cost for upgrading the software. Using Cloud helps in turning down the cost of the whole ERP project to more than 50% less to the original on-premise cost. For this reason, most of the larger companies are moving their ERP to Cloud. Examples of such companies are Amazon, Qualcomm, Microsoft, and Google. Most of these concerns in cloud computing are solved by using methods and techniques in the cloud. The major concern of the present day cloud application, especially ERP is "Security".

5. METHODOLOGY OF RESEARCH

The workflow of our Research can be given in a simple flow as figure 1.

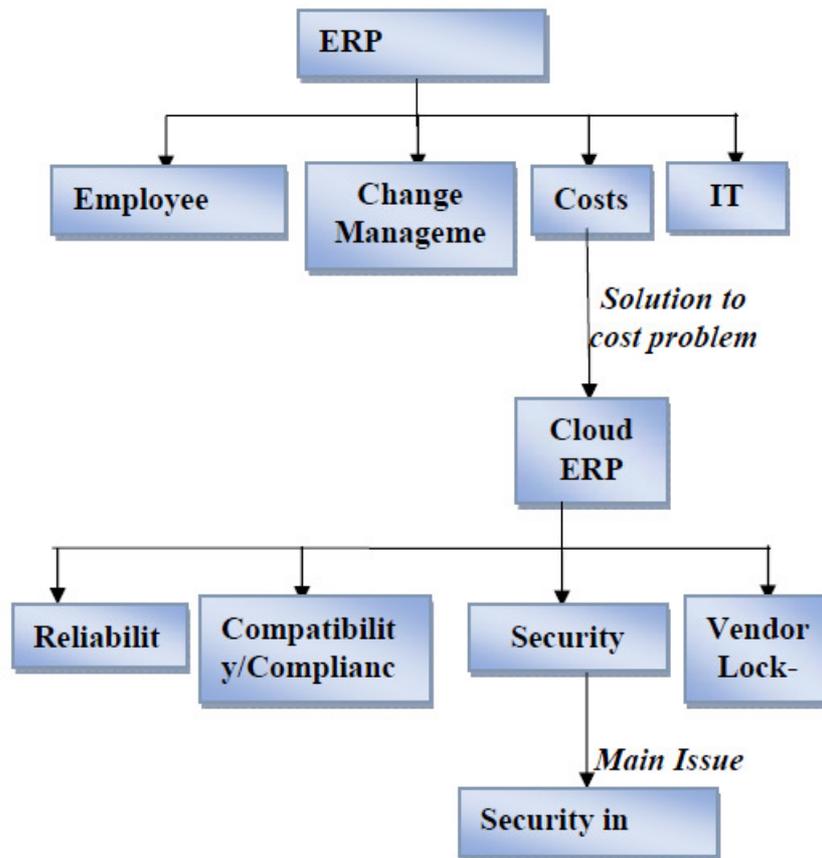


Figure 1. ERP Cloud Work Flow

6. CONCLUSIONS

ERP is an excellent tool to improve the Organization's profit margin. Providing a solution to the challenges faced by the ERP is not a huge task but implementing them at the right time in the right product provides the best results. The solution to the cost problem of ERP i.e., the Cloud ERP works amazingly for all the cost problems of the ERP software and also saves a lot of capital cost to the organization. Apart from the security concern of cloud ERP, everything else works well for any organization that would like to use ERP in the cloud without investing money on infrastructure. The Security concern of Cloud ERP has few solutions proposed but this issue is still skeptical from the view of users and the providers as well. The breaches in security will also cause violations of privacy leading to a new issue in the Cloud ERP. Hence, as the future work of this paper, a solution can be proposed to mitigate the Security issue of the Cloud ERP to a maximum level, so that the Cloud will become a safe place to work on ERP with a very less cost to the organization.

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