

## Classification of the Important & Critical Factors in Enterprise Resource Planning

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**Abstract:** This article will discuss new critical success factors of ERP implementation with the help of theoretical perspective and experiences of various companies regarding ERP system implementation. In the implementation of ERP senior leadership role play a vital role as well achieving to the ERP benefits management should build strong alignment between IT and the business processes. It is recommended in the arrangement/ classification that measurement proceeds in a balanced perspective, which can provide useful information to help companies in the process of decision making, and achievement of corporate goals. On the basis of this idea the classification of ERP is based on in-depth analysis of literature review, theoretical perspective and various companies' experiences of ERP implementation. Companies can achieve the benefits of ERP through commitment of top management. In this paper the fresh critical factor will help to the companies during the implementation of ERP systems.

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### 1. Introduction

ERP – Enterprise Resource Planning plays important role in the company and. Because Information technology is called backbone of the supply Chain Management [1,2] due to the information technology companies can achieve the goal of vast visibility and speed. According to the researcher, authors in [3] focus on factors of competitive advantage is the ability to make speedy processes in the supply chain. More and more companies are going towards improvement in the IT systems [4,5] the investment in ERP was the highest investment in total investment in Information Technology. According to the researcher [6] the mainly the ERP (associated high cost) and problems of ERP implementation create pressure over companies to think again for acquiring & implementing some enterprise system. ERP provides many benefits there are no doubt like managing & integration cross functionally in the processes of business, usually it is expensive to buy (millions of dollars) and longtime take in installation & result as disruptive companies changes [7,8] that's the major reasons some companies before enjoyed great improvement and many accept minimum payoffs, take back their initiative and give up their plan to implement ERP [9,10].

In this article we discuss to theoretical basis of Enterprise Resource Planning system in terms of benefits realization process, Classification of the ERP critical factor of success on the basis on theories and practical. And classification will determines the link between ERP benefits, success of ERP and ERP factor (critical) of success. This research will contribute to an magnify process of ERP benefits awareness, where the factors

(critical) link between Enterprise Resource Planning and performance improvement of the business, Information Technology, Structure, business processes, and finally culture & management systems.

### 2. Major Drivers of the ERP

The definition of the ERP same as other integrated standards software, enterprise business systems, enterprise wide systems, enterprise application system, and enterprise systems [10,11,12] has been defined before by many authors but it is almost same. According to the [13] Enterprise Resource Planning system as a standard application software (customize able) which have core solutions for the integrated businesses process including production planning warehouse & inventory management, ERP provides an holistic view of whole business from a one information & architecture of IT. During 1960s focus of manufacturing systems was only inventory control concepts. Then slow by slow the focus of the system of manufacturing moved towards MRP (material requirement planning) Systems during the period of 1975 MRP has converted in to the standard MRPII (Manufacturing resource planning II [14,15].

According to the MRP system which was trade with capacities (resource) known as MRPII systems. MRPII was managing a production plans, Production orders and inventories and further to these techniques integrate together is called ERP [16-17]. Enterprise resource planning systems work with human resource

data, financial and sales data, tolerating to companies product price, financial statements and manage their resources of material, people, and money [18,19]. In 1990s the ERP emerging trend led to the inclusion of the function including accounting and sales management etc. ERP consolidate to the processes of the business and information technology on the one integrated solution's point and these MRP & MRPII of course were unable to provide these results [20,21]. ERP software marketing is increasing day by day and in upcoming 5 years it is expected to be \$15.68 Billion to \$50 billion. According to ERP market in the 1997 was \$15.68 billion and in next few years it is almost \$72.63 billion. And that's why experts has analyzed it will be more grow. ERP is the first approach who integrally combines to the IT concepts and business process management [22]. ERP strength is its ability to give comprehensive business functionality in an integrated way using IT infrastructure [23]. There is no doubt that's enterprise systems have improved to the information flow in the whole company through the SC (supply chain) to such a degree [24,25] one of the significant and vital achievement of the ERP is that core activities, such as human resources, finance, supply chain management and manufacturing have been automated and improved (better than before) by best practices so as to facilitate speedy decision-making and better managerial control and big reduction in the operational cost of the company [26]. The basic ERP architecture is built on the basis of one application, one data base, and a unified interface in the whole enterprise. And whole company is able to operate under one application (standard) where all other applications (SCM manufacturing, accounting, sales etc.) are integrated with ERP as well ERP is the software, which can make decision making process speedy, reduce to cost and control over business operations.

According to the Computer technology research corporation, companies are motivated to implement ERP in two parts one is Technological and second is operational. Operational drivers are making improvement in business performance including improve to (speed) responsiveness in the deliveries to the customers, complex business processes, cost reduction, opportunity to expand business globally and technological drivers related to the replacement of disparate system, increased visibility and velocity, integration with the business processes, simplification and integration of the business acquisitions with the existing information technology infrastructure, obsolete systems, and attainment to the system that can backing to the growth of the business.

### **2.1 Cost of ERP Systems**

ERP system increases to the efficiencies in the business by provide them with unified access of too much information, which they need [26]. An ERP system provides mechanism of integration in every organizational IS. And then organizations have ability to take immediate reaction towards marketing opportunities and competitive

pressures, minimize to the inventories from the whole system, and end to end integration in the supply chain, and increase visibility.

ERP advantages usually divided in two categories one is tangible benefits and second is intangible benefits which are included better and high visibility in the systems, better business processes, quick response to the customers, cost minimization, high flexibility in the system, information and data sharing is easy and reliable, better integration in whole system of supply chain and finally supply chain processes become more improved with high visibility and on the other hand intangible benefits are include reduction of workers, reduction in cost in terms of inventory, better order management, sophisticated and reliable closing of the financial cycles, reduction of the costs in terms of IT and procurement, high profits, reduction in transportation logistics cost and time, high customer service, minimization to the lead time. Usually after the 8 months of implementation (new systems) benefits can be visible, from the new ERP system the median annual savings was \$1.6 million in-fact these all significant and major benefits of ERP system may provide it itself very expensive (usually the cost of ERP is in thousands and some circumstances it is million dollars) even under an ideal situation, but these cost increase more when company go towards ERP execution phase; Computer Technology Research Corp and also some misc. cost including consultant hiring, staff required for working in the implementation phase as well company need to buy and install latest and new hardware to support ERP software and data base for storage of ERP's data, end user (employees) training, conflict management and change management cost. In the bottom line each and every company who go towards implementation phase of ERP they phase two major problems Cost and complexity [27].

### **2.2 Classification of the Critical Factors**

The most major benefits of the ERP is, it is change to the old (legacy) all existing methods of doing business, and after ERP each and every process will follow to the ERP. If any company does not adopt ERP same like this way, they face big and critical problems during the implementation phase [28]. During the implementation of ERP huge cost are involved and company bear this cost also changing the many traditional processes and culture, but these all are the part of significant benefits which achieve from ERP. According to the many companies become dissatisfied from the "ERP implementation" but in-fact process reengineering and customization tasks are the part of this ERP software. How ERP system can improve to the business performance to

reflect the stages of spirit of the company concerned & what it is that they seek to reach in terms of competitive results as per the study of [29].

1. Success of Correspondence is called when planned objectives (specific) and IT systems matched.
2. Success of Process is called when Projects of IT complete within the time duration and budget.
3. Success of Interaction: where end user's attitudes are positive for IT.
4. Success of Expectation: when end user's expectations and IT systems are come on single point.

There are five major benefits; which companies can achieve from implementation of ERP systems.

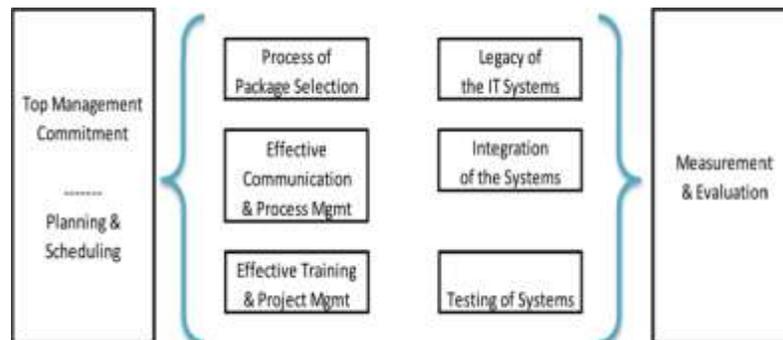
1. *Managerial benefits*: better resource utilization and management, improved to the planning & decision making and finally overall performance improvement.
2. *Operational benefits*: reduction in the cycle time and cost, improvement in the productivity, quality and customer services.
3. *Strategic benefits*: strategic including play role in

building business innovations, building cost leaderships & external links with partners, supporting to the business alliances and growth.

4. *Infrastructure benefits*: increases to the capability of IT infrastructure, cost minimization in IT.
5. *Organizational benefits*: organizational related to support and facilitates building common vision, empowering & facilitating to the business continuous learning, support to the positive changes in the organizations.

ERP (Enterprise Resource Planning) also have many intangible benefits as we have discussed before. These benefits including flexibility, integration and synergy buildings, it provides capability to the organization and ultimately enhance to the final efforts of strategic planning and competitive edge.

In the figure 1 representing the classification, inter-relationship among major business strategy and the role of IT can show in supporting the effective arrangement of key business essential.



**Fig. 1** Classification of the Critical Success Factors

### 2.3 Top Management Commitment

In the ERP implementation in the organization, the most important and critical factor is senior and top management commitment; senior management has a vision and promulgated approach of champions, and who can implement change like ERP systems effectively. And they are not against the modern and new ideas which are good for the employee learning curve and business growth by new technologies and best practices in the supply chain management. If we review to the highlights of Microsoft, so we can easily notice that's senior management of Microsoft approved to the implementation of ERP and not only approved but they were also involve on critical execution phase. If we talk about ALEVO, so here was same top management and all entire board level approved to the implementation. In the ERP implementation one important thing is selecting the

right and suitable vendor and consultant. Senior management role is not end on only approval of the ERP project, in-fact real role of senior management start after the approval of ERP project to keep and overview to each and every stage and senior management commitment play vital role in the implementation of ERP Project. After the in-depth study of many case studies we have analyzed that's smooth implementation of ERP is possible with effective change management from senior management. HP experience of ERP implementation, they noticed ERP implementation is not about "Processes & Technology" but it is about people. Involvement of all employees with commitment of senior management ERP implementation can be effectively and efficiently. Because senior management can resolve to the conflicts easily in the organizations, management can arrange suitable resources for the project easily, effective

decision and fast implementation, and create cooperation between the dissimilar groups in the company, and monitor to the project.

### **2.4 Planning & Scheduling**

ERP considered as the process-oriented IT tool, which play vital role in the improvement of the business. There is no doubt that's vision and mission play an important role in the improvement of the business, because these shows to the right direction and right strategies that can help as the blue-print for the company success. Accordingly good mission and vision are those, which could be measureable, then the mission and vision can help as the effective role. In the light of vision and mission of an IT is developed as a small part of the company business strategic formulation process. It addresses related problems that are measured from a technical, supporting and enabling perspective as well by shaped by a comprehensive gap analysis, capturing leading best practices from same competent companies. According to the senior managers of IT should know new technologies how can integrated and play role in each part of their business (tactical and strategic level) and in the business strategy formulation process, IT executives should be involved same as business executives. Business strategy and IT strategy alignment is also consider as the fundamental principle. Business strategy and IT alignment is only possible by the support of senior management for IT. And through clear goal and strong team work can maximize to the role of alignment. The same IT strategic alignment is applied in the implementation of ERP systems. The major problem which companies are phase it they do not understand to the business propositions, limited clarity of the vision the try to implement software, Which outcomes face as the "totally disaster and failure". Without the clarity of the mission and direction the ERP execution can be converting in to the disaster easily.

### **3. Arrangements for the ERP**

These factor concerning about what is the issue during implementation and change to the plans in to the actions. Enterprise Resource Planning fundamental role is defined with the clarity to support to the business process management from every aspect including strategically, tactically and operationally.

#### **3.1 Process of Package Selection**

Usually organizations failed to select right system, which can fulfill to their business needs and be match able with the company's corporate and business strategies. During the selection of Information System Company's procedures of business is crucial important. Successful execution of

ERP is depend on many things mostly including human resources, IT capabilities, senior management commitment towards ERP implementation, selection of right vendor, test scenarios building which can represent to the future processes. Companies also should fulfill to these criteria during selecting the package of ERP including level of local support, affordability, domain knowledge and software upgradability [29].

#### **3.2 Effective Communication & Process Management**

As per the in the ERP project implementation communication is most challenging task. Plan of the communication should be in detail and cover to the several areas mostly of the briefings strategies of change management, business process management, tactics, and points of contacts. In the ERP execution communication has to shield objectives and tasks [30]. Nowadays in the decade of modern technology we can minimize to the barriers of communication by online meetings , conferences, telephone , e-mail, video conferences, face to face, social messengers and others tools [31]. Prerequisite of the ERP implementation is redesign to the processes. Before implementation of ERP companies should find out and identify to the processes where reengineering is required, another wise without good processes only installation of the best system is not enough.

#### **3.3 Effective Training & Project Management**

ERP failure one more reason is insufficient training to the employees and end users. Many companies invest millions of dollars on the implementation of ERP system in the organization but ultimately they face failure and collapse of the systems only because lack of training. During the training of ERP application companies should provide the good understanding about the business processes. According to the training of ERP should be on knowledge transfer and also involvement of consultants. As per the study of Davenport and other several researcher 90% ERP projects are over budget and complete the deadline. Which means schedule is not good and cost estimation is not on the reality basis. And sometimes changes in the project scope believe that's successful completion of the project is depend on capable project manager (strategic and tactical projects) whose have expertise in the project management activities. Authors also purpose 10 success factor of project management. In the strategic factors including top management support, project mission, project plan or schedule. In the tactical factors including client acceptance, monitoring & feedback, technical task, troubleshooting and good communication, usually it is difficult to acquire external expertise to facilitate successful implementation

including ERP- vendor support . Many companies are proving the ERP related services but ERP marketing is growing very fast and there are very few competent consultants available in the market. And ERP consultants should have multiple skills including technical, functional & interpersonal skills. Nevertheless vital success factor is knowledge transfer process or mechanism, where vendor role is clearly defined and then consultant's expertise can be transfer satisfactory in to the ERP project [32].

### 3.4 Legacy of the IT Systems

According to the legacy systems are based on old information technology infrastructure including hardware and software. In the light of during the implementation of ERP system legacy system should be defined and evaluated carefully to determine the nature of the problems which company can face. Adequate infrastructure must be well planned so then it can be reliable , and companies should manage the legacy systems very carefully during ERP implementation. If companies have very old legacy systems so then resistance of change can convert in to the challenging situation for the organization. Some companies have many legacy systems in different region, factories and units and they stored data separately, but when they come-up on ERP implementation phase so they face resistance from many sides and sometimes it is challenging, so very important is for the organization is to change legacy systems carefully and by broad plan.

### 3.5 Integration of the Systems

Authors believe that's in the implementation of ERP one big problems which companies face is cross-module integration in the systems. Whether there are many other middleware technologies which used to resolve this issue and integrate to the software application from many vendors to the ERP, but these all are not only for ERP systems as well use of middleware is usually to focus over technical aspects, not for the linking to the processes of the business, and sometimes organizations need to develop in-house interfaces for commercial software applications. Accordingly infact maintaining to the integration mix is also need a huge and continuous expenditure of resources. As per study results, companies consumed 50% of their IT budget over the integration of the different applications together. Whenever maintaining to the system, Information systems workers face with the challenge of keeping & managing integrated with different systems [33].

### 3.6 Testing of Systems

According to the [33] during the implementation of application systems may not be realized in a single

step, the functionalities (new) are better tested alone & in conjunction with the functionalities (existing). ERP implementation without proper planning can be disaster for the organization. ERP system's testing and validation are very important to test that's business process are configured and software are working technically. In light of when process of business are running, the important test is whether the business processes described & represented in application system and processes are match taking place in the company. During the implementation of ERP in Guilbert, testing considered very important and vital because the system (new) were not working properly in parallel with the old systems of the company. As per the testing phase was undertaken the system configured and after this all system tested through user trails.

## 4. Measurements & Evaluation

Measure to the business performance, many costing techniques and approaches are used, which provide more reliable results, basically through cutting the link between demand of external rules & internal management reporting. Many authors argue that's management accountants should permit responsibility for the performance measurement towards responsible for succeeding performance. According to the non-financial measurements of performance should be achieve a balanced in both operational measures and financial measures. And discussion of balanced between operational and financial measures more explained by they suggested five perspective in the "Balanced Scorecard" including Internal business, innovation & learning, financial, customer & strategic planning. This approach become popular and many companies did adopt.

To measuring to the success of the business or success of any project (like ERP) the critical and important factors are measuring the evaluating performance for example pay back, NPV, Cost benefits analysis etc. Accordingly few measurements are not broadly prevalent as an integrated practice as well those implementation is not clear, straightforward process. These also have been advised in classification, measurement should be in a balanced perspective, should provide valuable information, which can support able during decision making process, and also can support to achieve corporate goals. In ERP contexts, the measurement and performance management should reflect a big and complete picture, including such as reliability in the systems, flexibility, visibility & velocity, cost etc. and it is recommended that's checking, auditing and benchmarking are study for optimization, available potential in the all aspects of the business. According to the external benchmarking bring new ideas, best practices which can increase to the efficiency of the ERP system, including control to the

bottleneck problem, redesigning & improving to the systems to achieve more benefits.

## 5. Conclusion

This article will contribute in the existing knowledge of ERP. By the critical factors approach this study has fresh classification of maximizing benefits of the ERP. This article argues that's, if constricted & strong link in between measures of business performance and implementation approach are exists, then benefits of the ERP can recognized. Due to the implementation of the ERP companies can achieve many tangible and intangible benefits ERP concepts is an innovative, support to the whole systems that is compatible with the requirements of ERP modules, which can support to the effective execution of the business process. In the last, a numerous critical factors has been find out which can help to the companies during the implementation.

In this paper we have highlights that's senior management commitment play a vital role in the implementation of ERP as well clear vision and direction provided by top management. The classification focuses on the business process management, as a business achievement major requirement in the value chain approach. When ERP systems support to the core business strategies, then ERP benefits will more magnify. Due to the measurement and monitoring of the ERP systems' implementation converts in to achievement of all business goals. In the bottom line, effective implementation of ERP is only possible by commitment of senior leadership and selection of right vendor.

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