Study on Critical Factors affecting on ERP implementation process.

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Abstract: ERP stands for Enterprise Resource Planning, an integrated software packages which give new dimensions for the organizations to enhance their business process with high-tech and advance computing manner to minimize the fault and errors which came with traditional business process. The paper is focusing on the complexity in ERP implementation process with various critical success factors get influence during its implementation. The paper also discuss the categorized the founded critical success factors into managerial, operational, financial and technical category, which can provides more concentrated analysis on it to overcome to the factors during the ERP implementation in the organization.

Keywords: ERP, Enterprise Resource Planning, Critical Success Factors, CSF, BPR, business Process, Business Engineering.

I. INTRODUCTION
Enterprise Resource planning (ERP) is latest high-end solution, information has lent to business application\(^1\). The process to implement ERP system into the organization creates lots of complexity right from the beginning of idea comes in to the organization mind till the post implementation of ERP system. The research paper is tried to highlight the various factors affecting on the ERP implantation process. The entire paper in various sections mainly we try to discuss ERP implementation process in very first section and next section we have given small review on the similar subjective literature of different authors and researchers. In third section of the paper we have highlighted the critical success factors that have influence on the ERP system and it also get classified into four major types i.e. Managerial, Operational, Financial and Technical Critical success factors of ERP implementation process in any organization.

II. ERP SYSTEM AND ITS IMPLEMENTATION PROCESS
The ERP solutions seek to streamline and integrate operation processes and information flows on the company to synergize the resources of an organization namely men, material, money and machine through information\(^1\). Before going to discussed any factual things on the critical success factors on ERP system ,w e need to study the overall ERP process and its steps to follow during its implementation , which gives the idea of various steps and sections of implementation process/

2.1 ERP Implementation process:
ERP implantation processes have three main phases, firstly Pre-implementation phase, secondly In-implementation phase and finally Post-implementation phase. Every phase is unique but interdependent to each other, following table shows ERP implementation in very detail;

<table>
<thead>
<tr>
<th>Phase</th>
<th>Pre-implementation Phase</th>
<th>In-implementation Phase</th>
<th>Post-implementation Phase.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>BPR Process + BE</td>
<td>Development Approach + SDLC</td>
<td>Monitoring + Maintenance</td>
</tr>
<tr>
<td>Activity</td>
<td>Analysis Business engineering</td>
<td>Planning Design</td>
<td>Review Monitor</td>
</tr>
</tbody>
</table>
In the above mention activity every phase has different sub-activities; in pre-implementation phase the organization doing Business Process Reengineering (ERP Implementation Process) in which analysis current business process to achieve dramatic improvement, in critical, contemporary measures of performance such as cost, quality, service and speed. Ultimately ERP implementation process decides the strength and weakness of the organization and gives the result to management need for some improvement in their old and traditional way of working. After getting idea from ERP implementation process the organization has to do Business Engineering (BE) where emerging two concept namely Information Technology and Business Process Engineering, which helps to maintain total quality management to maintain the quality in their existing working system and then the business management and modeling has to perform which gives an idea about different modules of organization and their internal relationship, where the organization gets the different data models and information which gives the resource requirement and utilization needs through some automated tool i.e. ERP.

After analyze the need of ERP in organization In-implementation Phase, where actual Software development life cycle (SDLC) going to implement, ERP implementation is the special and sensitive process for organization. It brings together in one platform, different business functions, different personalities, procedure, and ideology with an aim to pool knowledge base to effectively integrate and bring worthwhile and beneficial changes throughout the organization. In implementation phase first and most important process is analysis of the current state and working environment, information, need, resources, objective and goals of the organization. After analysis the design step going to implement where all the different functional and modular information gathered together logically. Next process is development of software according to its design using some appropriate software tools e.g. SAP, BAAN, OracleSoft etc. by getting actual package development .The most and crucial process is testing, where we have to check whether the ERP is implemented according to its objective or not in different prospective like functional, managerial, operational etc. if everything goes as per plan then the deployment of the software package in organization is for actual use. Before handover the ERP into the organizational people, the ERP development team has to provide special training to give some motivation to the organizational employee to ERP specifications and the usability terminology. Finally the technical team at organizational side will use the ERP, for which it is actually implemented.

The Post-implantation phase also continuous, dynamic and time consuming process in nature because none of the team member guaranty about the problems which may come after the ERP implementation. This phase reviews the ERP tool and monitor regularly, if any technical issue may arise then according to its nature the suitable resolving get done for maintaining continuous control over the ERP system.

ERP (Enterprise Resource Planning) is an industry term for the broad set of activities supported by multi-module application software that help a manufacturer or other business managers. Originally, ERP packages were targeted at the manufacturing industry. ERP is a massive software engine that seeks to provide one seamless interface to all departments, systems and existing data within the

<table>
<thead>
<tr>
<th>TQM Business modeling</th>
<th>Implementation Testing</th>
<th>Resolve Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deployment Training</td>
<td>Use</td>
<td>Maintenance</td>
</tr>
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</table>

**Table 1.1: ERP implementation model**

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organization. Enterprise Resource Planning systems are commercial software packages that enable integration of transaction-oriented data and business processes throughout the organization and perhaps eventually throughout the entire inter organizational supply chain\^[4]. A typical ERP system integrates all of a company’s functions by allowing the modules to share and transfer information freely\^[3].\^[2].

### III. LITERATURE REVIEW

Critical Factors approach was first used by Rockhart, (1979) in IS (Information Systems) area. Several studies identified the critical factors needed to enable the project managers and management boards to improve their ERP implementation projects. Implementing successful ERP systems is investigated by many researchers. Their general focus was on identifying CSFs that need to exist in any organization to have successful ERP implementation. These factors have been tested in different organizations in many developed and developing countries by number of researchers\^[11,12,13,14,15,16,17]. It has been applied to many aspects of IS including project management, manufacturing systems implementation, reengineering, and, more recently, ERP systems implementation.

### IV. CRITICAL SUCCESS FACTORS AFFECTING ON ERP IMPLEMENTATION PROCESS

**Factors Affecting on ERP Implementation Process.**

Now in this section, we are try to analyze the factors which are affecting on the ERP implementation process and the factors also has different aspects of the organization like managerial, operational, financial and technical.

#### 4.1. Managerial Factors:

These factors are associated with the Top level management like the managers, board members etc. as they have the vision and mission, they plays very essential and manifest role in the ERP implementation process. Chang management means the organization is prepared to admit the change in the present working style; they also keep the bright and clear vision and mission to believe the new changes in the organization. While performing the same, the Top level management support need by the development squad. Every process requires sufficient resource to get into the actuality and if the given resources which are restricted to get consume in such appropriate method, so that the wastage or idealism of the resources will not occur during the ERP implementation.

<table>
<thead>
<tr>
<th>Managerial Factors</th>
<th>Operational Factors</th>
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<tbody>
<tr>
<td>Change Mgmt</td>
<td>Project Delay</td>
</tr>
<tr>
<td>Vision &amp; Mission</td>
<td>Gap Analysis</td>
</tr>
<tr>
<td>Top Mgmt Support</td>
<td>Risk Analysis</td>
</tr>
<tr>
<td>Resource Mgmt</td>
<td>Vender Support</td>
</tr>
<tr>
<td>Project Mgmt</td>
<td>Operational Standardization</td>
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<tr>
<td>Post Implementation maintenance</td>
<td>BPR</td>
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**Table 1.2 Factors Affecting on ERP Implementation Process**

#### 4.2. Operational Factors:

During the implementation of the ERP process, the better control over the operational activity is more important. By better control over the operational activity we can identify and analyze the different constraints like time, cost, and resources and also change in behavioral and structural
changes in the ERP implementation process implementation. While considering the better monitoring and control over the ERP implementation process if any gap get indentifying in the process so immediate action has to get take to avoid any serious consequences of the gap. Risk analysis play a very vital role in the ERP implementation process by which we can identify the internal and external risk which can affect badly on the ERP implementation process.

4.3. Financial Factors:
The real fact is to get more money you need more money. Finance is the factor which has more closed link with the business as compare to any other factors. While considering the financial factors we more concentrate on overall ERP implementation cost. As the ERP implementation process is very time consuming process, it requires more resources and for the resources you require more finance. Other than above planning and execution cost also play the vital role in the financial category, where resources like planning and execution time, people involve in the team require more finance. With the same costing factors the business process reengineering also have to consider infrastructure cost where the organization might be require more and advance infrastructure to establish and implement new ERP system. Finally some financial need on the basis of external bodies like trend union, government financial policy, stock market also affect on the ERP implementation process during its execution and implementation.

4.4. Technical Factors:
One of the most important and critical factor during the ERP implementation process implementation is technical factors in other word IT factors. First and most important factor is organizational acquisition for the new technology and it take long time and if there is time taken activity then the cost of the process get increase. To implement, monitor and control the ERP implementation process we must have well qualified, technically sound and highly experienced team members. After implementation people who are going to work on the new process they must have the knowledge of the new technology and working environment so they have to get trained before going to work on it. In this session lots of efforts has to take by the technical team of the ERP implementation process. Technical infrastructure for ERP implementation process also plays the very crucial and vital role, where the organization has to setup the new hardware and software for the new business process. The installation, backup, controlling and monitoring the equipment, analyzing integrity and consistency in the IT infrastructural components are has to get maintain and monitor to avoid future problem.

V. CONCLUSION
The study concludes about ERP implementation process is very complex and time consuming process. It includes pre, in and post implementation phase which are further scattered in small phases, which proves its very complicated process for implementation and organization need to perform lots of efforts. The research also flow the light on different critical success factors need to be consider for the ERP implementation process. Dividing the found factors into managerial, operational, financial and technical which again provides the opportunities to the researcher and organizations who want to implement the ERP system in to their organization focused deeply on the critical success factors during the ERP implementation.

REFERENCES