Selection, Implementation and Post Production of an ERP System

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Abstract: Enterprise Resource Planning (ERP) is an enterprise level system that integrates all the business processes of an organization into a single database. ERP System enables all the departments of an organization to share and manipulate the data. ERP system has a centralized structure consisting of one single central database which can be accessed by all the department(s). This centralized structure is one of the major reasons of current ERP system’s popularity. Selection of an ERP system plays a vital role in the implementation of ERP system. We used AHP method for the selection. Once proper selection has been made, the implementation process begins. This process entails; accurate requirement gathering, user training, technical training, testing, data migration etc. Our research will give an in-depth analysis and recommended approaches for the preparation of RFP document, selection of ERP system, selection of vendor, requirement gathering, system design, testing and final roll-out. The objective of our research is to ensure successful implementation of ERP system. Our research also proposes a potential model for implementing an ERP System. Our model proposes the organization to have two (2) major committees: (1) ERP Implementation Committee (2) ERP Steering Committee. ERP Implementation Committee will drive the complete implementation process. It must include members of all the department of the organization. Since, the system is for the functional users, it is essential that all the stakeholders are part of this committee as well. In addition, the ICT (Information & Communication Technology) department should also be a part of this committee. The other committee is the Steering Committee; this committee should consist of members of top management of the organization. All business process reengineering should be directed to the ERP Steering Committee. Steering committee is also responsible for supervising the overall progress of the implementation. They will also decide the level of customization necessary for the ERP System.

Keywords: ERP Implementation process, selection of an ERP System, RFP development of an ERP system, proposed implementation model of an ERP system

1. Introduction

Enterprise Resource Planning System (ERP) is a centrally integrated system within all the departments of an organization. With the rapid evolution of web 2.0 and web 3.0, ERP has now become a necessity of today’s world. Due to its centralized nature and numerous benefits, more and more companies have adapted the ERP Systems. Implementation of an ERP system is a very significant and crucial process. It requires involvement of not only the implementation team, but also all the stakeholders (including users etc). In this paper we will discuss the implementation process of an ERP System in detail and review the process with the help of a case study. We will also look at some of the common issues faced during the implementation with proposed solutions.

2. Development of strategic and implementation committee

Creation of a strategic and implementation committee plays a critical role in successful implementation of an ERP system. It is recommended to involve all the stakeholders in the implementation process, as it not only gives them a better understanding of the system, but will also help modify the system throughout the process to meet the needs of the organization. It will also play a vital role during the post-production implementation process.

3. Buy vs build

While deciding on the type of the ERP system, there are two major options. An organization can either buy an existing ERP solution or they can build their own custom ERP system based on their requirements. This is one of the major decisions to be made by the organization based on their needs and available resources. (Kim J., 2009: 10) If an organization chooses to use an existing available solution, they must be a little flexible on the desired functionality. Even though, customization is an option while using an existing solution, too much customization is not recommended. (Zhao Y, and Fan S., 2007: 13) Surplus amount of customization may result in making the system unreliable. In addition, applying new patch and release may become a laborious and expensive operation.
On the hand if the organization chooses to build their own custom solution, they can be more obstinate about their requirements; however, building a new solution will take more time and such a system will also need time to mature. In addition, it usually costs more than using an existing available solution.

Regardless, of whichever choice an organization makes, the decision should be made by the entire steering committee of the organization.

4. Development of Request for Proposal (RFP) document

Development of the RFP document is important as this document states the basic requirements of the system. If the requirements are stated clearly and precisely, the implementation process will become easier. Therefore, it is important to spend considerable amount of time and effort for the development of a clear RFP document. A sample RFP document may look like the Figure 1.

![Figure 1: Popular RFP templates, 2010: 2](image)

The first column indicates the hierarchy of the desired modules. The second column indicates the criterion of the desired module. The third column indicates the priority of the desired module in the system (may range from 1-10, with 10 as the most important). The fourth column indicates if the given module is mandatory or optional. Mandatory implies that the organization must have the functionality in order to be able to proceed. These four (4) columns should be filled by the organization. The remaining six (6) columns should be filled by the vendor (in case of using an existing solution) or the developmental committee (in case of building a custom solution). Out of the box means that the functionality is already built-in into the System. Modification via supported means the functionality can be made available with minor configuration changes. Supported via third party solution means the functionality is not available in the system but it can be integrated with 3rd party solution. Minor Customization means it can be achieved with minor changes in the coding. Major customization means it can be achieved with the major changes in the source code. FUT means the functionality is not available right now in the system but it will be available in the future release or future patch. NS means not supported in the system and it is also not recommended to do the changes in the source code for such functionality. It is basically core business processing changes.

5. Selection of an ERP system

The RFP document developed in the previous stage gives a clear picture of the desired features with their respective priorities. Once the requirements have been clearly stated, the implementation committee will need to select the ERP System. We can use methods like AHP method for selection of an ERP System (Kunz J., 2010: 7). Implementation committee must review each and every requirement stated in the RFP document and carefully propose to choose the vendor that satisfies most or all the desired
requirements (Lall and Teyarachakul, 2006: 1). While planning the level of customization, one must not plan the desired customization more than 10% (percent). Final decision about the selection should be made by steering committee based on the facts and the recommendations of the ERP implementation committee.

5.1 Practical example

The proposed method was successfully implemented in a higher education institute in Karachi, Pakistan. The university core business was Campus Solution System which they used to connect faculty and students. However, the existing system was not integrated and had multiple databases in it. In addition, proper reporting system was also lacking and duplicate efforts had to be made due to multiple databases. In order to resolve this issue, university decided to go for an ERP System. Management was also flexible to re-engineer their process and was willing to adopt best practices in the organization. (Quiscenti M, Bruccoleri M, La Commare U, Noto La Diega S, and Perrone G., 2006: 14).

5.2 Selection Method for ERP system

Steering committee created a team that included business users, functional owner and the IS team for selecting the system. Series of ERP System workshops were arranged for evaluation process. We selected core business functionality to evaluate the mandatory needs of the system for the organization. We selected AHP Method for selection an ERP System and incorporated the evaluation data in it. We identified nine major criteria and under each criterion relevant sub criteria that covered the complete expectation of the users (Shapira A, and Simcha M., 2009: 6). Figure 2 shows the results of three major systems that were considered.

<table>
<thead>
<tr>
<th>Functionality</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>Priorities of alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Business</td>
<td>1.00</td>
<td>0.90</td>
<td>1.00</td>
<td>0.602</td>
</tr>
<tr>
<td>User Friendliness</td>
<td>1.00</td>
<td>0.67</td>
<td>0.33</td>
<td>0.095</td>
</tr>
<tr>
<td>Flexibility</td>
<td>1.00</td>
<td>0.33</td>
<td>1.00</td>
<td>0.151</td>
</tr>
<tr>
<td>Reliability</td>
<td>1.00</td>
<td>0.67</td>
<td>1.00</td>
<td>0.154</td>
</tr>
<tr>
<td>Data Migration</td>
<td>1.00</td>
<td>0.33</td>
<td>1.00</td>
<td>0.161</td>
</tr>
<tr>
<td>Cost</td>
<td>1.00</td>
<td>0.25</td>
<td>0.33</td>
<td>0.074</td>
</tr>
<tr>
<td>Implementation Time</td>
<td>1.00</td>
<td>0.25</td>
<td>1.00</td>
<td>0.156</td>
</tr>
<tr>
<td>Vendor Technical</td>
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<td>0.33</td>
<td>1.00</td>
<td>0.083</td>
</tr>
<tr>
<td>Post Production</td>
<td>1.00</td>
<td>0.67</td>
<td>1.00</td>
<td>0.179</td>
</tr>
</tbody>
</table>

Figure 2: Results of three major systems
Figure 3 shows the priority values of each aspect. For example, functionality was assigned maximum weight-age as compared to other aspects. Questionnaires were prepared with a list of mandatory functionalities (Wei C, Chein C, and Wang M., 2005: 5).

<table>
<thead>
<tr>
<th>Priority</th>
<th>Functionality</th>
<th>User Friendliness</th>
<th>Flexibility</th>
<th>Reliability</th>
<th>Data Migration Interface</th>
<th>Cost</th>
<th>Implementation Time</th>
<th>Vendor Technical Skills</th>
<th>Post Production Support</th>
<th>Priority of Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>0.14</td>
<td>0.30</td>
<td>0.17</td>
<td>0.066</td>
<td>0.042</td>
<td>0.042</td>
<td>0.021</td>
<td>0.083</td>
<td>0.082</td>
<td>0.22</td>
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<tr>
<td>0.14</td>
<td>0.096</td>
<td>0.69</td>
<td>0.755</td>
<td>0.069</td>
<td>0.042</td>
<td>0.042</td>
<td>0.021</td>
<td>0.083</td>
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<td>0.082</td>
<td>0.653</td>
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<td>0.092</td>
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<td>0.074</td>
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<td>0.070</td>
<td>0.021</td>
<td>0.083</td>
<td>0.082</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Figure 4: Final results

6. Selection of vendors

While selecting the vendors based on the requirements, we may end up with more than one vendor who is providing a potentially suitable solution (Grossman T, and Walsh J. 2004:3). The following are the four major criteria to be considered while making the final decision:

1. Must have similar business experience
2. Must have recommendations by clients in the same geographical region
3. Must have success stories of implementing same or similar solutions.
4. Must have proven experience in providing ERP support service

7. Recommended organogram for the organization

Figure 5 shows the recommended organogram for the organization. Project director would be the core responsible person of the project; however ERP project manager will play a vital role both technically and functionally. He would also be responsible to conduct functional training session(s) for all the users.

Figure 5: Recommended organogram
8. ERP implementation process
A proposed ERP implementation process comprises of the following phases:

8.1 Requirements Gathering Phase
8.1.1 Requirements Workshop(s)
8.1.2 Requirements Documentation
8.1.3 Requirements Review and Signoff
8.2 Technical Training Phase
8.3 System Design Phase
8.3.1 Solution Design Workshop
8.3.2 Solution Design Documentation
8.3.3 Solution Design Review and Signoff
8.4 Testing Phase
8.4.1 Training for the users
8.4.2 Functional Training & Testing Phases
8.4.3 Signoff of Testing Phase
8.5 Data Migration

Signoff from all the stake holders must be obtained before proceeding from one phase to the other.

8.1 Requirement gathering phase

8.1.1 Requirement workshops
This phase involves requirement gathering. (Parr A, and Shanks G., 2000: 9) This is one the very important phases of ERP implementation process. All the functional head(s) should be a part of this phase. Inputs from all the stake holders must be taken. GAP Analysis will be identified during this phase as well. Organization should be flexible enough to change the business process in order to avoid too much customization in the system as excessive customization makes the system unreliable. Also, adding of new patches or updates may result in creating problem(s) for the organization. Roles and rights of the user(s) should also be decided during this phase.

8.1.2 Requirement documentation
In this phase all the requirements based on requirement workshop should be documented so that it can ensure that all the stake holders are on the same page. Since the GAP Analysis is also performed based on the requirement, stakeholders will clearly understand what they will get in the new system.

8.1.3 Requirement review and signoff
All the stake holders will review the document and signoff. It is very important to involve all the functional users to be part of this process, so that they can have a feeling of ownership of the system.

8.2 Technical training
This phase is very critical and it has to be performed for the ICT (Information and Communication Technology) Department. This phase will provide technical training to them which will enable them to give
their maximum input during the design and testing phases. The lower the dependency on the vendor, the more successful the system would be.

8.3 System design phase

8.3.1 Solution design workshop
Screen shots or prototypes of the system should be created and showed to the functional users based on requirement documentation. The prototype would help the non-technical functional users to understand the functioning of the system as the snapshots would give a preview of the actual system to be implemented. It will also help them understand their input parameters for all the forms and reports. They will also see the validation of the forms. During this phase all the changes as per the design can be accommodated.

8.3.2 Solution design documentation
Based on the design workshop, a detailed documentation should be made for the system design workshop. All the changes should be accommodated as per the requirement of the functional owners.

8.3.3 Solution design review and signoff
Once all the changes in the document have been incorporated, all the functional heads should sign the document.

8.4 Testing phase

8.4.1 Training for the users
Proper training sessions should be arranged in this phase so that the users can obtain a better understanding of the system. This will aid the testing of the system.

8.4.2 Functional training and testing phase
Testing phase is entirely dependent on the training of the system. If proper training sessions have been conducted not only for functional heads but also for functional user(s), they will be able to properly test the system based on the requirements and design phase. Users can test the system with test data during this phase. Proper test cases should be developed to thoroughly check the system during this phase. ICT Department should be capable to thoroughly check the system along with all the users.

8.4.3 Signoff of testing phase
Once the system has been thoroughly tested, all the functional users need to signoff.

8.5 Data migration
After successfully completing the testing phase, it is time to migrate data from the legacy system to the new System. Deadlines (Cut-off times) should be established. All the data should be validated before it is made live. It is recommended to run the legacy system in parallel for one financial year. This helps verify proper functioning of the new system.

9. Final rollout
In this phase the newly developed system is made live and all the users in the organization are directed to start using the new system. Again, it is recommended to keep the previous traditional system running in parallel for some time to ensure proper functioning. It can also serve as a back-up.

10. Training
Training phase is a continuous phase for all the organization’s users. (Scott J., 2006:11). The more involved users are in this phase, the more comfortable they will feel in using the new system. Resistance of the staff will gradually decrease as they learn to understand and use the new system.
11. Post production of an ERP system

This is the crucial phase. It is important to have vendor’s technical support during this phase. A vendor resource available at the premises is a good, however, costly solution. Ideally, the in-house team should be able to handle the issues, in case vendor’s support is limited or not available. One must identify the post production cost before making the final decision as it may get very expensive. (Wei C, 2008:12). It is recommended to have at least one (1) year post production support in order to fully use the system to its fullest capabilities.

12. Conclusion

Selection of ERP is the major decision for the organization. It is a proven fact that a wrong decision in selection will adversely effect in the overall performance of the organization. Involvement of the stakeholders for selecting the product and using the right method for evaluating is the correct path for successful implementation of the ERP System. AHP Methodology is a recommended technique for complex decision making. AHP Methodology permits evaluator to evaluate priorities of alternative on the basis of performance of each condition (Teltumbdey A., 2000: 4).

Selection of the right ERP System using the right methodology makes the whole implementation process easier. Implementation of ERP System in the university or in any organization who are in the business for more than 50 years is itself a tough task. It is recommended to re-engineer the process instead of doing major customization in the system.

In this study nine major criteria and the sub criteria have been identified for evaluating the ERP System. University used AHP Model. First they developed the weight for the criteria, then they developed the rating for each decision alternative for each criteria and finally they have calculated the weighted average rating for each decision alternative (Laia V, Trueblood R, and Wong B., 1999: 8).

Implementation of ERP not only involves money, but also requires time, effort and dedication from all the stake holders. If the stakeholders are not part of the decision making process then they will not feel the ownership of the new system. Therefore, it is highly recommended to involve them from the beginning. Training of ICT department is also very necessary, they should be technically sound as eventually they will be responsible to train the non-technical user(s).

References
