

Evaluation of ERP Performance

This chapter briefly discusses the different attributes, required for multi-dimensional evaluation approach for assessing ERP projects. This approach can be easily extended to any big IT project. This approach not only helps in assessing the ERP projects but also in monitoring its progress during various phases of its life cycle and thus ensures protection of investment. Today's business is carried out through many forms and media. Enterprise-wide Resource Planning is a knowledge-based system, which is designed for the entire planning of the enterprises. In this chapter we will be discussing about the techniques and methodologies of the Enterprise Resource Planning and its implementation.

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5.1 Introduction

It is more or less clear that the evaluation is not easy by cost-benefit analysis, because it is not a traditional project. It is involved with the various functions of the business enterprises. Therefore, the ideal approach for evaluation should be *Top-down break up technique* [Teltumbde, 1999]. The general approach of this technique is to decompose the problem into smaller sub-problems, and these sub-problems into different attributes. These attributes can be analysed in a better way, so as to give a better evaluation result. These attributes can be identified with the help of structured methodology. The subjective and qualitative attributes are identified by continuous discussion with different groups and their commitments and then these attributes are being quantified by appropriate weight value, through an iterative feedback process.

The exact use of this technique varies according to the context of the overall objective of the problem. For a typical ERP project evaluation, it can be broken down into eight dimensions such as, strategic mission, organisation culture, risk analysis, implementation issues, flexibility, external factors, costs and benefits. Out of these dimensions, many can be used as attributes. The process of evaluation has been shown in Fig 5.1.

The process starts with the project profile. Then it undergoes the stage of feasibility study. In this phase, strategic mission, risk, implementation issues, organisation culture, flexibility, and other external factors are considered and then it passes through the cost-benefit analysis. After looking into different aspects of the ERP project, it is selected for implementation [Strassmann, 1997]. The schematic diagram is shown in Fig 5.1. The different components of the schematic diagram are discussed below.

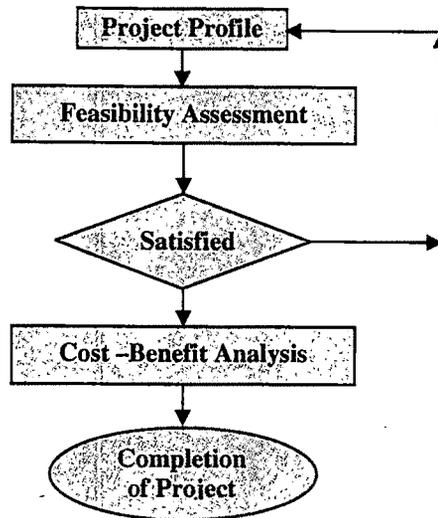


Fig 5.1 Feasibility Assessment of the ERP project implementation.

5.1.1 Strategic Mission

This is the first and foremost aspect (dimension) of the ERP project implementation. It is required to assess the contribution of the project to the overall business strategy. This job can be accomplished through a process of continuous arguments and discussions with the top and middle level managers. Afterwards, the relative assessment is translated into a score on a ten-point scale. It is always useful to carry out the discussions through a negative question like what will be the impact on business strategy if the project is not taken up? Whether the ERP product is covering all aspects of the business? and so on.

The users should analyse the product before purchasing and investigate whether the product is really covering all the indented properties and aspects of business. The user should be careful enough while selecting the ERP product out of many, due to the recent boom in the ERP business.

5.1.2 Organisational Culture

ERP projects have significant impact on the roles, relationships, sources of power, employee's morale, organisation structure and thereby overall organisation culture. This dimension is usually ignored in the project evaluation process, which can have much more influence on the success of the project. To assess the impact of a particular project profile on the organisation culture, the negative questioning can be helpful. The question like: Are you going to be benefited from the ERP implementation? Will you be satisfied by the ERP system implementation? etc.

The biggest threat may come from the organisations that implement the ERP without understanding the real advantage. Apart from the corporate commitment to implement, it needs the vision of the top executive to take advantage of it. Therefore the organisation culture is important. Secondly, the non-availability of competent professionals within the enterprise makes it incapable for the implementation of ERP. Therefore, the key-users in the organisation are to be trained fully for ERP implementation and after that they are required to run the day to day business. In reality it is very difficult to practise, because, many times the employees who have deputed for the ERP project, have been transferred to some other units before the completion. As a result the implementation couldn't succeed.

In order to study the organisation culture and the inside story, it is better to hire a management consultant to look after these attributes. Leading ERP vendors have strong alliances with world's best management Consultants as well as market leaders in the respective business. These alliances provide guidance on the best business practices. Similarly the vendor has to tie up with leading IT companies for incorporating advanced IT trends.

5.1.3 Risk Analysis

It is a well-established fact that risks and returns are positively correlated. Generally, the IT projects have high risk of failure but they are rarely concerned with its assessment. In the ERP project the potential risk areas are the change management, IT infrastructure and

project management. The assessment of risks is essentially a continuous process, involving discussions, assessment and consolidation. While assessing risk, the user has to check the current trend of the information technology in the ERP products. One must be ensured that the ERP package contained the current tools and techniques of IT, because the IT scenario is changing very fast. Secondly, it is necessary to examine, whether the ERP vendor is committed to the incorporation of the latest trends in IT in their products. Next question is how strong is the development team and what is its future plans? It is not so easy to incorporate the best business practices in all the functional areas well as the current tools of IT like Web technology, Java, object oriented technology and so on. It is important to observe that whether the vendor has really focussed its corporate attention behind ERP or not.

5.1.4 Implementation Issues

It is equally important how to implement the ERP package in the enterprises. There are several questions come to the mind before the implementation. How committed is the ERP package for the Indian environment and secondly what about the Indian version? How many installed base of the ERP product, does the vendor have and how much experience the vendor has in that particular type of business? How strong is the implementation team? What is the strategy for the post implementation support and upgrades.

The ERP implementation is still in its infancy and will take time for the organisation to look for something else than an integrated system. Let us discuss these questions. It has to be confirmed from the vendor, that they have to be committed themselves to provide new tools and continuously update the product, based on business practices in India from time to time. Every country has its own ways of doing business and the cyber law (legal and tax laws of IT) is coming into existence in all most all countries sooner or later. Secondly, one should not be a scapegoat after purchasing the product for the first time. The user should investigate who are the other users and should try to learn from their experiences. It is highly recommended to meet the key users from the organisations where ERPs have been implemented successfully.

Another critical factor in selecting the ERP product is how confident the implementation team. Very few ERP vendors are there, who have the right confidence in implementing ERP. This is a different skill than the ERP product development. A good implementation team should possess knowledge and skills of ERP package, business practices of the organisation, where it will be implemented, and maturity of implementation. Ideally the user should have procured the profiles of the people, who will be involved in the actual implementation.

5.1.5 Flexibility

It means, how well the ERP system, will continue to perform with the changing business activities, change in the technology, etc. over its lifetime. It provides flexibility in entering, storing, calculating and seeing the data. This flexibility is useful and necessary because people within an organisation think differently and want to see data suited to their thoughts and requirements. At the same time, important people outside the organisation such as customers and suppliers, also think and behave differently from each other and prefer to be treated distinctively. Flexibility in an ERP helps in being responsive to customers and suppliers.

There is also a drawback of flexibility. More flexibility will give rise to more complexity. That is why the flexibility software such as SAP is very complex. It has some 7000 tables into which, one can enter values that determine how SAP will work. If some one will know that entries in these tables are not independent from each other, then he can understand why people pay so much to SAP experts [Hiquet, 1998]. The evaluation of the flexibility determines how the project derives benefits at the time of implementation and also how it is getting return in future. Evaluation of flexibility typically has two attributes: i) Prediction of changes that may come in the business environment in future and assessing the capability of the system to meet these changes; ii) Assessment of the constraint that may be created by the ERP project implementation.

The user should analyse the relationships between the ERP vendor and the Hardware vendors. This is also an important factor, which should be flexible in nature. As there are many developments taking place in the Hardware, before releasing any new

product the ERP vendor and the hardware vendor have to ensure that they continue with the best performance. There have been instances where the ERP products have become non-compatible with the new releases of the hardware and operating systems.

5.1.6 External Factors

ERP implementation project requires a team of analysts from all the areas of business and should have wide knowledge about ERP product and process that have different links to business operations. IT professionals, who are responsible for the implementation of the ERP should work hand in hand with the ERP experts, of the vendor, system engineering staff members and the management consultant. There are many unforeseen attributes come in between, which has to be taken care by the implementation team.

Another question is that whether the ERP package supports the best business practices or not. The leading ERP vendors of course implement best practices in the ERP products. Therefore, the organisation should look for such a vendor, who can support the system and act as a process advisor.

5.1.7 Cost Analysis

The estimate of costs should account for all types of costs those have been incurred in the process of ERP project implementation. It has been studied that IT project costs are generally underestimated to the extent of 30% to 40%. Moreover, the prices of ERPs refer to the price of the ERP software product only and clearly it excludes the cost of hardware and the cost and charges to be incurred for customising the ERP to suit the requirement of the organisation. The total cost of Installation of an ERP is worth Rs.1.5 Crores on an average. But getting the best out of it will often require an equivalent amount of investment in computers and communication systems. Therefore, the costs associated with the ERP project should be evaluated jointly by the end-users, and user management, for a significant analysis. There may be many costs which are not amenable for quantification at various stages It is important to keep to record these factors, in the document for future assessment. As a result ERP products, like SAP appears to be very expensive. Usually ERPs are more expensive than in house developed applications.

Secondly, many organisations don't have methods and practice to cost in house applications.

5.1.8 Benefits

The efficiency and benefits cannot be estimated always numerically and therefore totally overlooked. Like costs, the implementation process should emphasise documentation of all assumptions behind quantification of benefits and the components that could not be quantified. The Real Benefit of ERP is in its integration. In the traditional enterprises, the excellent information systems are thereby in isolation. They may be serving the needs of the individual business functions but are not integrated. In the ERP system, all data are being captured only once, and the actual business process becomes a single process.

Let us see who will be benefited, by implementing ERP system. The customers are the first who are going to get the maximum advantage of ERP implementation. It can help the enterprises come closer to the customers. The entire architecture of ERP is directing towards greater customer satisfaction in terms of decreased lead time to deliver, respond and adapt to flexible customer wants and greater and faster customer service.

Secondly, with the implementation they will be able to run their business more efficiently. The knowledge gained by the ERP vendor can be available to them in the form of proven and standard business processes. The organisation will have a better control over the activities. They will be able to manage their resources in a better way and will have reduced cost of operations. Next, with the vertical growth of the business, the employees will also be greatly benefited. Without having proper systems of working they have to work hard. With the ERP implementation the stress level of the individual is expected to reduce. The system becomes more proactive. They can plan, monitor and control more effectively. Briefly speaking the benefits can be outlined as follows:

- i) Better management of the resources
- ii) Reduction in the cost of operation
- iii) Planning at functional and the process levels
- iv) Effective utilisation of human resources

- v) Decision making support at possible levels
- vi) Transparency of business operations
- vii) Management becomes knowledge driven

Selecting and implementing an ERP product is another important and time consuming task at the time of commissioning a new package. At last but not the least, care has also to be taken in estimating the total ERP cost and the post implementation scenario. The break even period, of ERP project is 2 to 3 years in general.

5.2 Multi Dimensional Expectation Web

In the last section, it has been mentioned that the effectiveness is translated into a score on a ten-point scale on different dimensions (attributes) of the evaluation. After getting score points on different dimensions, it is required to form a multi-dimensional expectation web representing a plot of values of the crucial attributes. This methodological approach comprises of determination of threshold picture driven by the business strategy in the form of web net. The process of iterative determination of the multidimensional web is given in the fig.5.2, for the evaluation of the project implementation at different points of time.

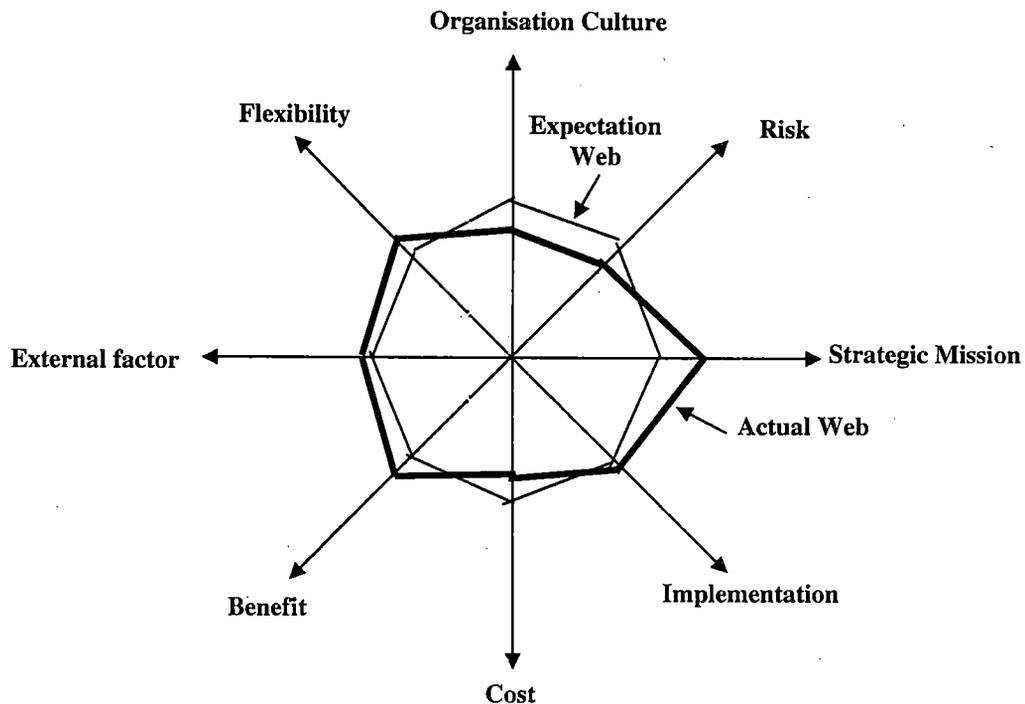


Fig. 5.2 Expected vs. Actual Web of the ERP Project implementation

The expectation web represents a normalisation process across the eight dimensions. While creating the expectation web, the reference project profile may not be acceptable on certain critical dimension and may thus need change. The figure shows the process of dynamic change on six primary criteria, i.e. strategic mission, risk, organisation culture, flexibility, external factors and implementation issue. The cost and benefit assessment is done after that, based on the resultant normalised project profile. However, the cost and benefit assessment also could influence change in actual web, along any or all of the eight dimensions and thereby influence change in the project profile.

5. 2.1 Expectation and Actual Web

The expectation-threshold web is the area of the minimum expectation, along the eight dimensions, shown in figure. With regards to financial analysis it corresponds to the expected rate of return. The process of building this web should involve preferably

members of the top management along with members from the ERP steering Committee. It is essential that they should have exposure to the conceptual framework of ERP and also to the experimental aspects of ERP implementation. This task can be accomplished by couple of workshops, where discussion on ERP system, products, implementation and operation. The actual assessment workshop can be organised afterward, through the process of constructive discussions and arguments. Finally, all the members have to get at the threshold score, on agreement. The expectation web is plotted by using these scores. It is quite natural that with respect to the change of time, the shape of the web may change. It is represented by the actual web, as shown in the figure.

5.2.2 Analysis of the Expectation and Actual Web

In the figure 5.2, we can see that there are two webs. One is ideal expectation web and the second one is actual web. These two areas bound by the two webs are compared to decide about the desirability of the project. Since, the area represents the measure of desirability, the actual web should fully hold the expectation web, i.e., the area of the actual web should be greater than that of the expectation web with all the points of the expectation web falling within the actual web.

If we consider the attributes are normalised in all the dimensions, in the expected web, then we can find that the risk level is less and the cost is less on the actual web. On the other hand, the mission is high and benefits are high value in the actual case. By analysing the two webs, one can infer that in actual practice, the value on different dimensions goes on changing time to time. Consider for example, value in benefits and strategic mission dimension has a higher value, but with low level of risk and incurring less cost. It can be a clue to examine the assumed information on which the expectation web was constructed. The graphical presentation has an advantage in locating the critical areas necessitating more information and validation.

5.2.3 Criterion for Selection of ERP Project

The minimum expectation is represented in the form of a web using the score points on different dimensions, representing the management expectation from ERP project. The

team responsible of evaluation of ERP project implementation construct similar web, which can be called as actual web representing the perceived value of the project. This team will anchor the process and co-ordinate the tasks of evaluation during the project life cycle. The comparison of these two plots, i.e. the expectation web and actual web for a particular project implementation gives an idea about not only desirability of the project but also the critical areas to monitor for the process of realisation of business benefits. The project profile in practice may be in reference to a specific ERP project or to some of the project parameters.

5.2.4 Change Management in ERP

The business process is changing continuously, and so also the ERP implementation has to change with the changes in the business environment, which is referred to as change management of the enterprises. The gradual change approach is normally preferred for the smooth implementation of the ERP project, rather than a phased change over. Therefore, the organisation requires very conscious and well-planned change management process. Innovation Associates have suggested a few principles about change management, which work effectively. Two interesting rules are as follows:

- i) *People don't resist change but they resist being changed:* Change management activities must be tailored to each organisation's unique need and to its specific past and its present reality. The change management should look to the business and organisation strategy and direction for the future. Effective change requires much more than just redrawing organisation charts or rewriting job descriptions.
- ii) *It is more effective to pull changes than to push changes:* Change management models based on fear have significant limitations. When the immediate fear or pain goes away, the motivation for change such as learning, improvement and innovation have also diminished, whether or not the objectives have been fulfilled.

Human desire and aspiration are powerful alternative motivating forces that produce higher and more sustainable changes in performance. Aspiration generates motivation in two occasions i.e. when things move well and when things do not move well. People

whose performance is based on aspiration will go on until they reach or exceed their goals or objectives and then they will aspire for new accomplishments. Innovation Associates have suggested four primary tools for the process of managing changes in the organisation. They are:

- i) Building personal vision as well as shared vision among the co-worker,
- ii) Generating productive conversations and team effectiveness,
- iii) Learning to think, plan and act systemically and
- iv) Use reflection to build knowledge capital and accelerate change.

Change management, which uses these tools and approaches that engage people, sets them in motion for a continuous change with respect to innovation and learning, it no longer needs to be driven by management.

5.3 Scope and Impact of ERP in India

India being one of the largest manufacturing in economy world-wide, needs the ERP solutions badly, to enhance the customer services and the management. The business organisations in India have already implemented their own MIS or DSS embedded on Unix or windows-NT platforms. Now, the organisations are going on in a big way for distributed LANs with their connectivity through Internet and Intranet for efficient and effective information exchange. The integration of the different functional components like Internet and Intranet, e-commerce, Data warehousing and extension to the supply chain management make the Indian business more capable to serve the customer. Intranet facilities have already made the Indian business processes more streamlined, with enrich communication and collaborations. The new approaches like data warehousing also facilitate the use of Business Intelligence tools for intelligent access as well as building multi-dimensional *On Line Analytical Processing* (OLAP) structure. ERP and the various other tools will definitely make information use for better knowledge management.

Organisations tend to look at ERP solution as an alternative to in house systems. Though to some extent it is true, but it is not the only reason why organisations go for ERP. ERP and supporting intelligent tools will not only be the need of corporate houses but is expected to be equally needed by medium and small organisations.

5.4 Conclusions

The world is moving towards a new economic model, where organisations and individuals are linked to achieve faster communication, conduct e-commerce and ultimately customers are given by value-added services. Secondly, international markets demand adaptability, flexibility of operations and quickness of response from the organisations. In this new business scenario, ERP is the most suited tool for the industries to achieve the multi-dimensional objectives. In this chapter we have covered, the different attributes, required for multi-dimensional evaluation approach for assessing ERP projects. This approach can be easily extended to any big IT project. This approach not only helps in assessing the ERP projects but also in monitoring its progress during various phases of its life cycle and thus ensures protection of investment.

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