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Dr. Amol S Kalgaonkar

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This exercise covers this aspect of decision making process and tries to codify the same to get an advantage of as good as having multiple consultants' experience at the fingertips.

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E.R.P. implementation is many times a very important step in the overall IT and business transformation of any industry. While, right choice of product is important it is also important to decide the need of ERP as well. From this context, this work is an attempt to establish a rule based system for the same.

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I. INTRODUCTION

Implementation of Enterprise Resource Planning (E.R.P.) has many advantages for any organization in many direct and indirect ways.

Direct advantages are; improvement in efficiency, integrated information, and better decision support whereas indirect advantages are; better corporate image, competitive advantage, improved customer satisfaction.

However, there are multiple challenges and situations come across when one wants to implement. Often the ERP solution is deployed in an organization.

Deployment of a solution is a process of identifying the needs, choosing the package and then putting the same in operation. But the word "Implementation" is used in place of "deployment". Implementation is a more widely accepted word for the process of deployment.

The initiation of this work is off-course with a discussion on enterprise resource planning (ERP) and the impact of the same on the organization, difficulties in implementation and the future of ERP software.

Since it is important for our work, we have discussed the need of a consultant. A consultants' role is very crucial in implementation, although even after we appoint consultants our implementation may fail. But that does not rule out the need. We have also discussed future scope of the work in this area and trends in ERP like ERP – II , IRP and some recent expert systems.

Since the whole work involves development of an expert system, we have studied and discussed expert system types and its evolution. We have also discussed details of expert system's structure, types, concepts, categories.

We have a proper expert system in place then for a given set of business rules the results would be more alike. This will certainly help in the probable requirement for integration. Moreover, since we have gathered information from multiple consultants who have worked on multiple projects, the tool will have multi-consultant, multi-implementation knowledge.

It is as good as having many consultants at your desktop. From all these facts it is justifiable from the application point of view to take up the study and development of this expert system for ERP implementation. Such an expert system will certainly be a useful tool in decision making. The use of expert systems has been successfully done in similar situations in other fields, so we feel that consultants will certainly be benefited by such an expert system.

II. PROBLEM STATEMENT

The rationale behind the study was the need to capture and codify the decision making involved in an ERP implementation process. The implementation here means, right from the decision process which involves finalizing whether an organization needs an ERP, to ERP selection; and from actual implementation to the post implementation support. In short, implementation means Deployment of ERP in an organization. It is observed that this process is very critical from the point of view of business success. Currently, many organizations fail to use a step-by-step approach in

taking this decision. This decision is a fairly dynamic process and varies from organization to organization; so identifying the decision-making parameters, their interactions and suitably representing them in an expert system, is the job of consultants. It is felt that the practical known advantages of any expert system can be obtained with the use of this expert system also to find out the need for ERP implementation in any organizational setup. Thus, this work can be viewed more as developing a tool that can be used in the decision making in a practical application.

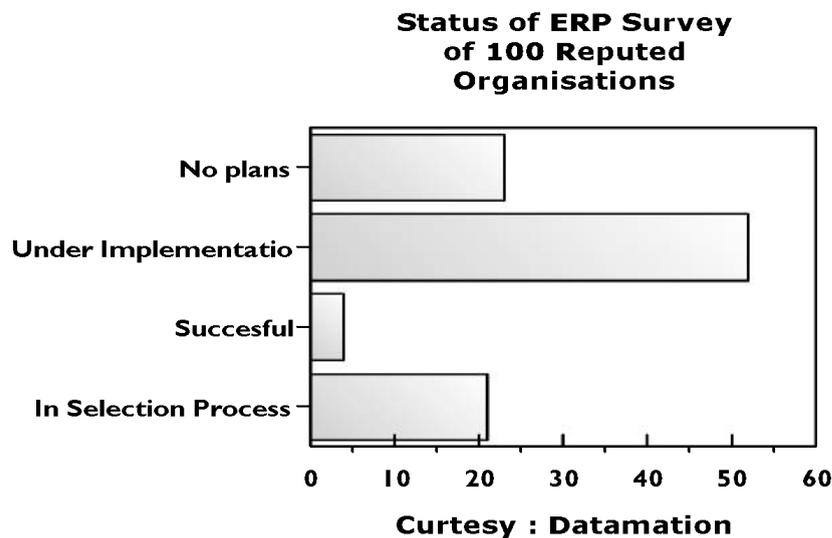


Fig. 1: Status of E.R.P. Survey

However, the scope of the study is limited to the decision making process of ERP implementation. The effectiveness of decision for deployment of ERP is very important from the organization perspective.

III. STATE OF THE ART

There are several reasons for the increase in the number of ERP implementation sites. Right from deciding whether to implement an ERP till the post-implementation support and enhancements at many sites, the decisions are very consultant-specific. So for an organization that has implementations at different sites or for a business unit having manufacturing plants at

different locations, the post-implementation scenario can be different, depending upon the acceptance ability of the corresponding location manager. Because of such a situation, many companies need to spend plenty of resources in terms of money and manpower if the need for integrating all location ERP solution arises after individual implementation.

Let us consider a situation in which a manufacturing setup has its plants at Pune and Mumbai. The implementation has progressed differently at each place but when the need for integrating these two plants comes in the future, many settings at one of the plants need to be altered to suit the other.

If we have a proper expert system in place then for a given set of business rules the results would be more alike. This will certainly help in the probable requirement for integration. Moreover, since we have gathered information from multiple consultants who have worked on multiple projects, the tool will have multi-consultant, multi-implementation knowledge.

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in similar situations in other fields, so we feel that consultants will certainly be benefited by such an expert system.

VI. OBJECTIVES

The main objective of the study is to design and develop a rule based system that will attempt to encode the knowledge and decision rules of expert consultants in the field of ERP implementation by understanding their thought processes. The understanding of the thought processes was achieved through reaching out to a pool of consultants through structured questionnaires and personal interviews. This data was tabulated and scrutinized for patterns.

V. FLOW CHART

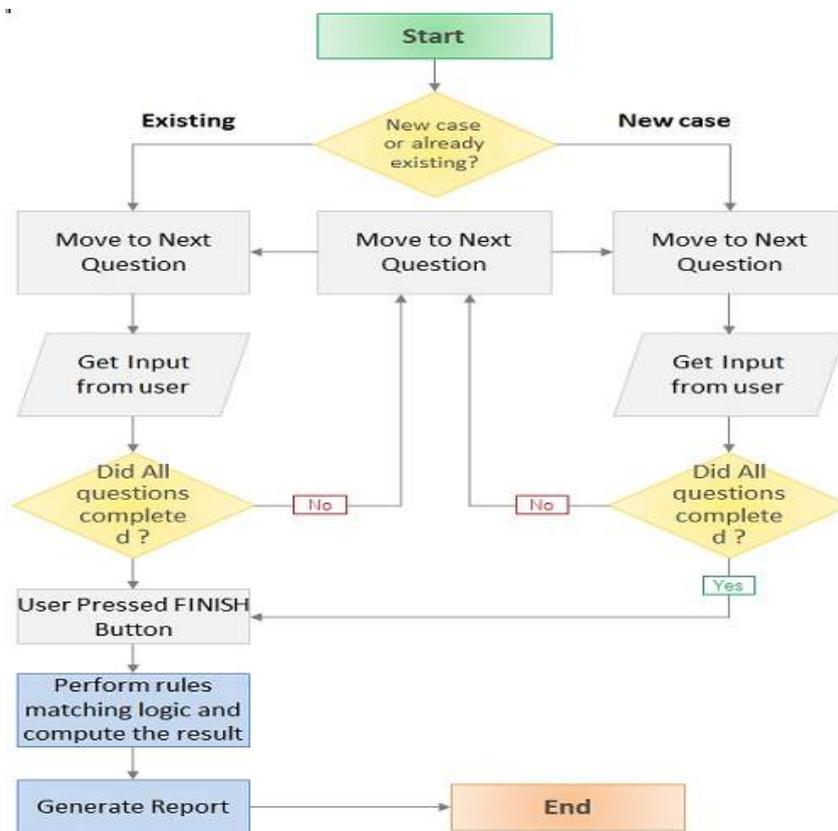


Fig. 2: Flow chart of level zero

Following are major milestones of the approach:

1. Research and Review – Before coming out with the idea of developing this expert

system, some research has been done regarding the previous and current technology in expert system itself. The research has gone into reviewing the literature of underlying concepts behind the

development of expert system. The result of the research and reviews which we conducted has given us insight in the actual development the expert system.

2. Conceptualization – After reviewing the outcome of the research, the basic concepts of expert system were then identified. Here all the underlying concepts of the expert system development were recognized including critical components involved in the development, the technology needed, compatibility of the software and hardware and system’s reliability.
3. Problem Assessment – Based on the concepts of expert system acquired in the conceptualization phase, the problem domain for the development of the system was then determined. In this phase, the appropriateness of the problem was taken into consideration as to make sure that it is suitable to be solved by the expert system. We studied the problem to determine the feasibility and justification of the problem, including defining the overall goals for the project.
4. Knowledge acquisition and analysis – Expert system is all about applying human expertise into a computer program, which is based

primarily on the integration of human knowledge with the system. The knowledge acquisition is the heart of any expert system. After the problem domain was determined in the previous phase, the knowledge and information based on the problem was gathered. Basically the knowledge was gathered through a series of interviews with the implementation consultants and by sending them structured questionnaires.

5. Design and Implementation – The analysis of the knowledge acquired in the knowledge acquisition phase has led us to the design of the system which includes overall structure of the system’s knowledge, the programming part and the user interface part. It was designed after an insight gained from the previous phase on the best approach for representing expert’s knowledge and problem solving strategies in the expert system. The method which has been used to process system’s knowledge was also defined in this phase, where forward-chaining rule-based expert system was selected as the interface engine. After all the elements were determined, the development phase was started for programming and user interface. In this project Visual Basic has been used in programs and user interfaces, and Access as a database.

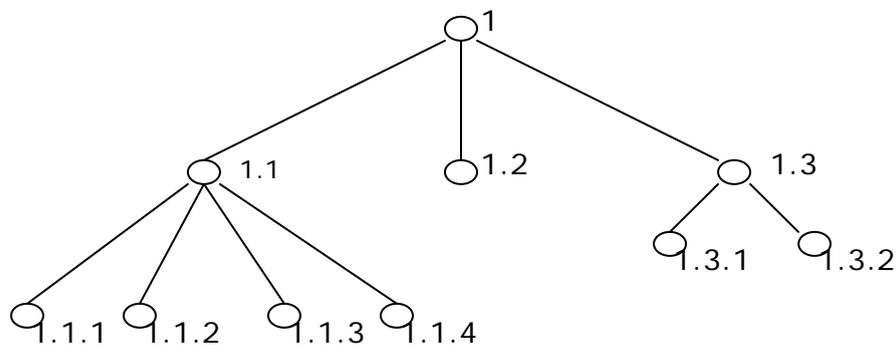


Fig. 3: Node

Analysis Table 1: Node details

Node	Meaning	Major Influencing factors	Possible results
1	Goal (Need ERP ?)	<ul style="list-style-type: none"> • Data volume • Business Complexity • Product Complexity 	<ul style="list-style-type: none"> • Yes • No
1.1	Data Volume	<ul style="list-style-type: none"> • Sales data volume • Materials Data Volume • Production data volume • Finance Data volume 	<ul style="list-style-type: none"> • High • Medium • Low
1.1.1	Sales Data Volume	<ul style="list-style-type: none"> • sales orders volume in Amount and numbers 	<ul style="list-style-type: none"> • High • Medium • Low
1.1.2	Materials Data volume	<ul style="list-style-type: none"> • Inventory volume • Purchasing volume 	<ul style="list-style-type: none"> • High • Medium • Low
1.1.3	Production data volume	<ul style="list-style-type: none"> • Number of products • Number of production stations 	<ul style="list-style-type: none"> • High • Medium • Low
1.1.4	Finance Data volume	<ul style="list-style-type: none"> • Invoices managed • Inventory carrying cost 	<ul style="list-style-type: none"> • High • Medium • Low
1.2	Reporting complexity	<ul style="list-style-type: none"> • Online / Offline • frequency 	<ul style="list-style-type: none"> • High • Low
1.3	Business operations complexity	<ul style="list-style-type: none"> • Business complexity • Product Complexity 	<ul style="list-style-type: none"> • High • Medium • Low
1.3.1	Business complexity	<ul style="list-style-type: none"> • Number of Business Locations • Currencies • Languages 	<ul style="list-style-type: none"> • High • Low
1.3.2	Product Complexity	<ul style="list-style-type: none"> • Made to order / Made to stock • Bill of Material complexity 	<ul style="list-style-type: none"> • High • Low

VI. EXPECTED OUT COME

Although, the system is expected to give us the result of E.R.P. implementation result on either side, the plan is also to generate a detailed

analysis report which will give a rationale and the rules path traversed for arriving at this decision.

We will also try to generate the outcome in a way which will be easy to understand and not a cryptic rules language. The plan is to incorporate business context in the whole report which in turn is more usable for decision making as well as analysis.

We will also see if this report can even be utilized for further business and other expansion plans simulation.

VII. CONCLUSION

Since these kinds of E.R.P. Implementation decisions are having long term impacts to the organizations and mostly are everlasting it is important that organizations take a calculated decision.

From the overall literature study and analysis it appears that such an expert system will be useful for effective decision making in E.R.P. implementation. This will probably act as having intelligence of multiple consultants at your fingertips to get help from.

VIII. FUTURE WORK

This study scope is limited to the decision on the deployment and selection of ERP solution for the organization. But we are expecting that, the software can be enhanced to capture the desired results expected out of ERP implementation and then recording actual benefits received. By this the success of the solution can also be found out.

Further, any organization who has implemented ERP can calculate some quantifiable ERP implementation index to identify the level of ERP implementation at that organization.

REFERENCES

1. Expert systems Applications in Integrated Network Management By Eric Ericson, LT Ericson, D Minoli 1989, Artech House Publication.
2. Essence of Artificial Intelligence By Alison Cawsey 1997 - Prentice Hall PTR Upper Saddle River Publication, NJ, USA.
3. Why ERP? : A Primer on SAP Implementation By F. Rebert Jacobs 2000, McGraw Hill Publication.
4. Enterprise Resource Planning: The Dynamics of Operations Management By Avraham Shtub 1999 -Kluwer Academic Publishers Norwell, MA, USA.
5. ERP Tools Techniques and Applications for Integrating the Supply Chain By Carol A Ptak 1999, St. Lucie Press.
6. A New Approach to ERP Customization By Avshalom Aderet, Ph.D. of Eshbel Technologies.
7. "Expert" knowledge module By Gary Berg-Cross.
8. On Line Integrated Computerized Information System By ABWEB INFOTECH PVT LTD.
9. Does the CIO need an ERP? By Geissler Golding.
10. Enterprise Resource Planning Systems By Rajiv Bankar.
11. www.erpfans.com ERP related news, chat groups. Used this site to discuss the questionnaires and add value to the same.
12. www.sapfans.com Same as ERP fans but this is specific to SAP.
13. www.erpevaluation.com ERP vendor evaluation site. Access was during early stage of the work.
14. www.baanfans.com Same as ERP fans but this is specific to BAAN.
15. <http://www.intuitivemfg.com/products> Intuitive offers ERP software solutions that enable mid-market manufacturing enterprises.
16. <http://www.bpic.co.uk/casesh> Home Page for Business Performance Improvement Consultancy.