



Assessing the Factors Affecting ERP (Enterprise Resource Planning) Application Selection: A Study on Education Sector

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Abstract

Every large organization is an amalgamation of different functions which stores immense amount of data. Such organizations are getting a huge support from the Information Technology and its innovative software, in order to manage all together. This has attracted the Higher Education Institutes (HEIs) towards IT Applications & Software which will support them. It will support them to operate in today's dynamic and hectic work cultures. HEIs need a more complex yet complete system which would help them to function smoothly. As a result Enterprise Resource Planning (ERP) emerged as a solution which can be adopted by the institutes.

ERP is useful for different sections such as management, faculty, staff, record handling, accounts, and students. It is a crucial step for organizations, especially those who are already operating, to choose and implementing new software as an integral part. Thus, it becomes inescapable to go through a deep discussion before selecting the appropriate software. This paper makes an effort to identify and assess the few core factors which could act as crucial selection element for HEIs. The components set a parameter which makes it easier to decide and select the best from the available alternatives.

The paper is based on both primary and secondary data. The source of primary data is in-depth interviews taken by IT and CS personnel. The secondary data has been collected by various previous research papers, thesis, reports, journals, documents and websites related to ERP software selection.

Keywords: *Enterprise Resource Planning, Education Sector.*

1. Introduction

In this dynamic and fast moving business environment, the organizations are inclining more towards integrated form of communication and information sharing. They need to manage the day to day activities very carefully in order to avoid issues in long term, but along with that the resource planning and customer handling is also a major part of work. The increasing need of better tools for management has contributed to major influence of Information Technology (IT) on enterprise working models.

Enterprise Resource Planning is a system which aims at connecting and managing all the different functions of an organization together in order to maximize the resource utility, taking effective decisions and boosting



organizational efficiency. ERP is designed in such a way that it supports the basic processes of a business and provides a real time view of its core functions. It integrates business functions, provide real time view, facilitate in prompt decision making, cost effective working and empowering the customers and users.

In the earlier days ERP was developed with an aim to provide facilities for production and manufacturing businesses, and was more related to core functions of enterprise. But later it was introduced in service sector too. In service industry also, the various functions need to be highly managed and operated well, as it is more complex in comparison to manufacturing industry due to its intangibility and customers oriented approach. ERP has already been introduced in various service sectors such as, hospitals, financial institutes, hospitality, human resources, etc, ERP is very supportive for performing the key service activities such as, delivery of services, client dealing, staffing of employees, service notification, contact management, etc. Each ERP should be customized enough to suit the various projects of service organizations. (deskera)[1]. But still there are few sectors which are in their primary stage of adopting ERP, one of which is Education Sector.

The education sector is also developing the need of goal directed management. Especially the Higher Education Institutes are identifying the emerging need of market, and trying to fulfill the need of their stakeholders (students, staffs and government). With the changing global trends, Higher Education's has been highly influence by government concern for effective and efficient performances by universities (david allen, 2001)[2]. In order to meet these expectations the institutes are searching for an easy yet powerful tool for management. And this need has brought the attention of education sector towards ERP Software. Now many educational institutes are adopting ERP for integrating their management functions. It provides ease in flow of information, better connectivity among teachers and students, well framed schedules and teaching facilities, payrolls and fees record maintenance, attendance and better teaching experiences. In developed countries it has already been adopted by various higher educational institutes, but few developing countries like India are still reviewing their resources for ERP adaptation. The institutes are analyzing the various aspects before choosing and implementing the software as it is an important decision to be taken. The software will bring a drastic change to the overall control system of organization, it will convert the overall functions interlinked and integrated. The institutes are continuously trying to improve their systems and administration in order to increase their value at national and international level. To meet the need of dynamic environment and to improve their business processes, the higher education institutes are investing largely in ERP software (Mehlinger L. B., 2013)[3].

ERP as a concept: The basic idea to introduce ERP was to integrate the various functions to provide an ease of accessibility to people associated with organization. It was introduced as tool which will provide a common or single database to be operated by various parties who work within organizations, or operate from outside.

The companies have recognized the need of interrelated and coordinated system of operating. The major objective of ERP was:

- Facilitate in prompted decision- making,
- Providing a single database to operate different functions,
- Provide support for different operations,
- Interface capability,



- Boost a more structured and organized system of data management.

ERP as a system: The ERP is based on modular software design. The whole system operates on a common database, and information from different departments is feed into it. These data are stored in a database which can be accessed through different departments as per their use. It allows the interface of data and establishes a coordinated functioning. Some of the popular service providers of ERP are SAP (System Application and Products), People Soft – Oracle, Microsoft dynamics, etc. There are few organizations which use customized and self-built ERP systems. In Education Sector some of the ERP systems are Mastersoft Education ERP, Eshiksha Classroom, School Management software, Peoplesoft Campus Solution, etc.

2. Objective

The various researches conducted in the field of ERP were focused on its implementation, determining critical success factors, its adaptation in different organizations, the benefits and issues with adaptation, etc.. But as per my knowledge there was very few researches done which identify the factors responsible for selection of an ERP Software in education sector, in India. This paper tries to fill this research gap by demystifying and assessing the factors affecting the selection process of an ERP application in Higher Education Sector in India.

The overall paper has been divided into following sections. Second section states the objective of this particular research work. The third section consists of various literature reviewed from different research work done on related issues. The next section states the research methodology used to collect information, which will be analyzed further to provide some valuable output in the form of descriptive explanations. And last the conclusions will be drawn as per output from various data and resources.

The main objective of the study:

- To identify the factors considered while selecting an ERP software application, by an Educational Organization.

The paper will focus on identifying the factors or criteria which a Higher Educational Institute should consider during selection of an Enterprise Resource Planning application.

3. Literature Review

The study focuses on ERP software, its selection and ERP in higher educations. The literature background is studied from previous journals, articles and conference preceding.

Enterprise Resource Planning is integrating software which is popular among organizations. Along with large organizations medium and small enterprises are also adopting the software for ease of work and better management. After realizing the benefits of ERP in large organizations, the Higher Education Institutes are also considering an automated system for better management and administration (Ahmad A Rabba'i, 2009)[4].

3.1 ERP

ERP is abbreviation for Enterprise Resource Planning, and it is basically business management software that allows the organizations to handle the back office functions and other integrated functions with a complete ease. These functions are usually related to the technology, services, and human resources, logistics, finance, etc; ERP software has now become extremely important as it is impossible for the humans to keep a record of everything



manually. This software helps them to manage almost every details and data of the company and employees with a complete ease (Advanta Innovations, 2018)[5].

ERP allows various departments to connect and communicate with each other and share different information. This sharing is possible with a single system only due to ERP application. This creates cooperation and increases interaction among different departments of a business organization (Harrison, 2004)[6].

Helmut Klaus, Roseanne Michael & Guy G. Gable, 2000, has stated that ERP is described in various ways, as a product, software, a developing object, a key element which delivers a solution, etc., by different authors and researchers. But there is still not any particular definition which can summarize the whole aspect of ERP in one universal definition (Klaus, 2000)[7].

This shows the difficulty of explaining ERP software in a single statement. But ERP has always been a better option over other software, for instance a Management Information System (MIS) also provides an automated system to operate, manage and improve the work system through information technology but an ERP is considered an advanced version of it. The main reason behind it is that MIS works at departmental level, whereas an ERP functions in an integrated way and connects all the functions of an organization together. This provides a more flexible working structure and coordination for different divisions working together (Leon, 2000)[8].

The ERP success and failure depends upon the various critical success factors which can lead to the negative and positive impact of ERP. The implementation process should also consider the viewpoint of stakeholders associated with the project, as they are the ultimate beneficiaries of ERP application (Ali Tarhini1, 2015)[9].

A case studied by **Baker & Frolick, 2003** they had illustrated the case of ERP failure of an independent bottlers in soft drink industry. The ERP implementation failed in this organization due to two main reasons which were, firstly they didn't consider the ideas given by consultant and ignored their recommendations. And second the lack of appropriate IT staff and understanding. Both these led to the failure of ERP in the organization. Even though they realized the need of ERP software, but then also they failed to understand the proper selection and implementation of the application.

3.2 ERP in India

The ERP was initially implemented by first tier companies in India, such as Maruti Udyog co, Essar, Sony India, Mahindra & Mahindra, etc. But it was later discovered that the market for ERP for large companies will be saturating soon. This created a market for medium and small scale industries to be targeted by ERP software vendors to approach the second tier companies. These companies framed a future market for the ERP application developers in India (EresourceERP, 2018)[10]. At present there are various companies which provide ERP Application for different users as per their need and capacity to adopt the system.

3.3 ERP in higher education sector

Other organizations and an educational organization differ from each other because of their environment and circumstances. Thus the ERP used in education sector is mainly for the academic purpose (Mehlinger L. , 2006)[11].



With the increasing influence of Information Technology on universities the adaptation of ERP has increased. It facilitates development and reengineering of administrative systems as a way to improve their performance (King, 2002)[12].

According to Radut and Codreanu the most important thing in ERP adaptation is its selection part, as it is the crucial point. A good selection decision will decide the future pros and cons of procuring and implementing any ERP system in organization. For this purpose they stated few criteria which must be taken into account while selecting ERP in any organization which were, functionality, reliability, efficiency, usability, maintainability, and portability (Radut, 2012)[13].

There are many issues associated with ERP selection and Implementations but the challenges associated with technology selection, change management, knowledge management and emerging technology need to be reviewed more in future, as they are still to be studied in brief and depends on changing environment (ranjan, 2016)[14].

This was a general idea for any organization. Although these criteria may differ according to the choice of company, type of organization, size of organization, vendors, environment and customized choices. For education sector in India these factors may correlate or differ as per requirements of institutes.

Rabaa'l, Bandara & Gable has done a descriptive case study was used for research at an Australian University named Queensland University of Technology (QUT), where they studied ERP in higher education through interviews. The university found that ERP is the solution for their complicated system. Hence they introduced ERP and implemented it after a deep selection discussion. The ERP at QUT is working well and providing a better management to the administration. The only issue they face is that there is no specified method or tools to evaluate o ERP at Higher Education (HE) (Ahmad A Rabba'i, 2009)[4].

4. Research Methodology

The main aim of this research is to analyze the major factors which affect the selection decision of Enterprise Resource Planning Application by an education sector. The focus is on the Indian HEIs who are very sensitive about selection & implementation decision of new IT software. There is a need of understanding that what could be the possible issues and components, which should be kept in mind by electing bodies while buying or acquiring ERP software. Every provider presents their work with a better picture which might create a situation of dilemma for institutes. This paper will aim at providing a help through assessing the selection factors through exploratory research.

The research methodology used is qualitative in nature. The qualitative study is preferred over quantitative study because ERP selection is a part of decision making which includes brainstorming and deep discussion.

Data Collection: The primary source of data collection was semi-structured, in-depth interview. There were eight qualitative interviews conducted. The interviews were carried out in Higher Education University; Madan Mohan Malaviya University of Technology, Gorakhpur, Uttar Pradesh. The focus was on the factors and components which should be considered while making ERP selection decisions by HEIs. The interviews ranged from 30-40 minutes with each person, and proper notes were taken during interviews. Audio records were also



kept for the purpose of analysis and record keeping. The respondents were IT Professors and Research Scholars who have adequate knowledge of ERP software, and its utility for an organization.

In addition to primary data, various secondary sources of data such as, previous research works, reports, publishing, journal proceedings, websites, etc, were reviewed in order to identify the factors.

5. Result

The analysis of interview responses and different secondary form of data revealed various factors which must be considered while choosing the ERP software in organizations. Factors such as organizational requirement analysis, assessing stakeholders need, cost-benefit analysis, compatibility, system reliability, availability of resources, vendor analysis, flexibility, expertise, and application specificity were highlighted by the respondents. In context of HEIs there were few additions such as customized systems, independency and user friendly, as the organizational structure and working may change frequently, and preference is given to the needs of students.

In HEIs the need of organization vary on the basis of different features such as, amount of data to be assessed, number of students, number of staff to be managed, academic sessions, events and programs conducted, admission procedure, etc. In such case the requirement may vary from institute to institute. But, despite of variations the ERP selection factors has been categorized in a way that it may provide a generalized basis for ERP selection.

The major factors are:

- (i) Organizational factor,
- (ii) Requirement analysis,
- (iii) Technological factors,
- (iv) Vendor analysis,
- (v) Cost-benefit analysis,
- (vi) Application specificity.

Organizational Factor:

The organizational factor indicates the elements which exist within the organization and influence the selection decision. It includes various sub-indicators. Organizational Capability indicates the availability of required resources in the organization. Management support is the Top – Management advocacy and commitment towards the project (Parr & Shanks, 2003)[15]. There should be a balanced team which will operate the whole system, experts to handle the complication. The people must have a positive attitude towards the changes.

Requirement analysis:

The major requirement of institute should be identified well before opting for any software. Without knowing the exact demand and needs it's impossible to select the best alternative. This is important because if the requirements do not match with the system, the system will be directly eliminated from the list of alternatives. (Haddara, 2018)[16].

Technological factor:



Technological factors are the technical attributes which characterize an innovation. (Dayal, 2016)[17]. It includes the different technical aspects such as its compatibility with the existing systems, technical development for future use, how complex it is and how easily it can be operated.

Vendor Analysis:

There are number of available vendors who can provide ERP services. It is essential to choose the most suitable vendor on the basis of their expertise, experience and budget specified. Several vendors are expert in specific field or function, in such case the vendor selection should be appropriate enough to meet the requirements. They act as ERP Partners who will resolve all the future issues and provide required expertise and help. Vendor's financial position and market position also plays a vital role (Stefanou, 2000)[18].

Cost-benefit Analysis:

ERP needs a huge investment at time of implementation. This is the reason organizations do cost-benefit analysis before investing in ERP. The return on investment should be high enough to bring long-term benefits.

Application Specificity:

The ERP software should be capable enough to merge with existing system working, and can be modified as per future requirements. There should be better access for integration of data and systems.

Organizational factor	Requirement analysis	Technological factors	Vendor analysis	Cost-benefit analysis	Application specificity
<ul style="list-style-type: none"> • Organizational capability • Management support • Balanced team • Commitment to change 	<ul style="list-style-type: none"> • Type of ERP • Customization • Stakeholders Requirements 	<ul style="list-style-type: none"> • Technical Compatibility • Complexity • Technical Development • Security 	<ul style="list-style-type: none"> • Expertise • Experienced • Agreement 	<ul style="list-style-type: none"> • ROI • Running Cost 	<ul style="list-style-type: none"> • Customization • Integration • Modularity • Flexibility

Figure: Major factors affecting ERP Application Selection in HEIs.

6. Discussion

The respondents have mentioned these factors during the interview, as they were very precise about the components. Few of them have named the factors in different ways, but have agreed to the major categories mentioned over here. The factors given can be supported by the statements of respondents, and different secondary source of study.

- 1. Organizational Factor:** It is very important to understand the need of organizations at very first. The idea of ERP implementation is highly dependent on whether the organization is demanding it or not. In HEIs the management needs to analyze various factors before adopting new software. Organizational resources such as manpower, equipments, financial resources should be adequate enough to implement ERP successfully. Sometimes, the people working in organization do not accept the changes or are too rigid to work on a new system. In such case, the organization should be ready to motivate people for the new working methods. "A different IT cell should be developed to handle the software development and improvement, and it must constitute technically expert personnel's to handle any sort



of complications in future.”(Mr. Bal Krishna Bajpai, Computer Programmer, former IT Professor, MMMUT).

“The managerial requirements and the objective must be fulfilled.” (Mr. Muzammil Hasan, Assistant Professor, Computer Science Department, MMMUT).

- 2. Requirement Analysis:** The requirement of ERP in HEIs is not associated with a single party. There are various stakeholders associated with them. For instance, the ERP software to be implemented will be used by different parties including top level management, accounts section; faculty members, non-teaching staff, and even the students need to operate their accessible data. This variation and multiple layer of data accessibility make it crucial to analyze the different requirement of different sections. Even for different departments the needs may vary as per their particular curriculum or events schedule or number of students opting for a course. “Thorough requirement analysis should be done by client and feedback from all stakeholders should be taken, also the choice of vendor should be wise enough.” (Mr. Muzammil Hasan, Assistant Professor, Computer Science Department, MMMUT).

In some organizations there is also a need of customized software. Many of the respondents have stated that customized software provides ease of use to the operators and is more acceptable in the organization.

- 3. Technological Factor:** Technological factor includes a long list technical attributes that must be there for a successfully utilizing the ERP software. The system to be adopted should be compatible enough to meet the present and future demands. It should not be too complicated to handle, it might demand the experts to handle a complicated system. But in HEIs not all the staff member s technically efficient to handle the complications. “The system has to be user friendly. Maintenance of system should not be an issue once installed.” (Mr. Sushil Kumar Sarooj, Assistant Professor, Computer Science Department, MMMUT).
- 4. Vendor Analysis:** Vendor selection is major step in ERP implementation. The selection of vendor is based on different aspects such as, the type of ERP required, expertise of vendor, their past experiences, the overall market reputation, available companies and the budget assigned. In such situation the vendors’ list should be reviewed well before choosing one. The chosen vendor is the one who becomes the ERP partner for organization in future, thus it needs a thorough analysis. “The vendor should be expertise in their field, and currently it must be providing services to other organizations too.” (Mr. Sushil Kumar Sarooj, Assistant Professor, Computer Science Department, MMMUT).
- 5. Cost- Benefit Analysis:** In HEIs there is always a set budget which is sanctioned for a project, and the tendor system is commonly used. In such situation it becomes crucial to analyze whether the investment is worth enough. The ROI (Return on Investment) is a major factor. Generally the purpose



of implementing a new software is to get benefits both for execution of work and financially. The running cost of ERP might be high, but the return on it must be comparatively higher, otherwise this will burden the organization in long run.

Unless the return or benefit incurred through the system implementation is high the one-time cost can be neglected. "The high cost is not that much important, if it yields long-run benefits in future." (Prof. A. K. Daniel, Professor, Computer Science Department, MMMUT).

- 6. Application Specificity:** The ERP software to be installed in HEIs should be flexible and customized. While selecting an ERP the organization must consider integration as a major component. The extent to which a system can be modified and integrated with the existing system and future requirements (Dayal, 2016)[17].

7. Conclusion

For any institute accepting the changes is a tough task to do. In country like India, the HEIs have been functioning from years, and thus they need an automated system to operate and manage the large amount of data. ERP systems have been a great support to business organizations, and now the companies providing ERP applications are focusing on Education Sector too. There are various ERPs which are designed and developed specially for the Education Sector.

This is an opportunity for educational institutes to modify their work system, and provide an easy way of data management and operations. But institutes need to analyze the factors of selection in order to avoid any future complications. Selection of ERP is the foremost step in ERP implementation process. It impacts the future stages and further impacts the overall organization. Thus, selection decision should not be taken in haste. It must be after a deep analysis of different aspects associated internally as well as externally with the organization.

The factors mentioned above will provide a guideline for HEIs in ERP selection process. The major limitation of this research was that the interviews were taken from a single institute. But there is future scope for the further study of this research work.

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Annexure

Interview Questions:

Given below is a set of Semi- Structured Interview Questions. The information collected through this interview will be used for Academic Research Paper on topic "Assessing the factors affecting Enterprise Resource Planning (ERP) Application selection: A study on Education Sector".

Que1. May I know your current role in organization?

Que2. What are your views on ERP software?

Que3. How ERP is useful in the Education Sector?

Que4. Will you support and suggest ERP implementation in Higher Educational Institutions?

Que5. Which factors should be considered for ERP application selection, and why?