To Study of ERP based software used in Construction Industries

Mr. Swapnil Tiwari[1] and Prof. H H Ahire[2]

PG Student, Department of Civil Engineering[1]

Assistant Professor, Department of Civil Engineering[2]

School of Engineer & Technology, D Y Patil University, Pune, India

Abstract*: The construction industry operates on a project-oriented business model that involves various stakeholders, such as owners, general contractors, architects, engineers, sub-contractors, material suppliers, and business partners. It is necessary to have extensive communication with these parties. Unlike other industries, this particular industry does not frequently encounter new technologies and procedures on a daily basis, with the exception of a few novel materials. Emphasise the significance of Enterprise Resource Planning (ERP) systems in the construction business, which enhance efficiency and productivity by minimising extraneous information. By conducting a market survey, we can determine the most often utilised ERP software for construction management in the construction industry. To thoroughly examine the intricacies of the programme and analyse its application within a Construction Company. To analyse the outcome of implementing the software in a construction company. To provide suggestions and recomm endations on software and construction companies. The construction industry is distinguished by several participants from diverse disciplines who are assembled at different phases during a singular project. The outcome is a dependence on an extensive collection of data generated by numerous sources at various degrees of abstraction and specificity, leading to the division of the sector. Compared to industries in distribution & commerce, service, and manufacturing, the construction business is far more unstructured and complicated*

Keywords: construction industry

I. INTRODUCTION

Enterprise resource planning (ERP) systems, often known as enterprise systems, are software systems designed to handle many aspects of business operations. These systems consist of modules that serve several functional areas, including planning, production, sales, marketing, distribution, and accounting. Based on our analysis, we may deduce that the construction industry is significantly more disorganised and intricate when compared to the distribution & commerce, service, and manufacturing sectors. Therefore, to ensure precise estimation, monitoring, and management of projects in terms of cost, timeline, and quality, modern management has adopted the implementation of Enterprise Resource Planning (ERP). This implementation aims to streamline processes and enforce better discipline, reducing reliance on employees. ERP encompasses financial, human resource management, project management, inventory management, service and maintenance, transportation, and e-business.

The software's architecture enables seamless integration of modules, ensuring the smooth flow of information between all departments within the organisation in a consistently visible manner. Implementing enterprise resource planning (ERP) systems in corporate computing enables firms to replace or re-engineer their legacy information systems, which are often incompatible, with a single integrated system. Enterprise Resource Planning (ERP) software programmes are at the forefront of information systems technology. Enterprise Resource Planning (ERP) programmes facilitate the management of business processes across a whole firm by utilising a unified database and shared tools for management reporting. ERP software facilitates the streamlined execution of busine ss operations by combining several business functions, such as sales, marketing, production, accounting, and staffing.

II. METHODOLOGY AND DATA COLLECTION

Steps in implementing ERP system

Internal Support: - Top-management support, planning, training, and team contributions can be groupedtogether to form a single factor from the results of their factor analysis and scale-reliability analysis.

Software Selection: - The importance of software capabilities, the software capabilities and needs are mismatched with a company's business processes, this can lead the ERP implementation to failure.

Consultant Support: - Top management identified that consultant support is one of the success and failure factors in ERP systems implementation. Questions were developed to assess to find out consultant's support for the ERP implementation project.

Information Systems Area Participation: - The information system should be included in ERP systems implementation was one of the most important factors that was highly associated with the success of ERP implementation projects.

Key Findings from The Literature Review: - Being very costlier, failure in selection or implementation of right ERP system will cause a dead investment of lacs and lacs of rupees.

Factors Affecting ERP Implementation

The major factors can be classified into four subheadings namely, the top management, training, the data collection & Software design and Testing. The 8 factors affecting the ERP implementation are determined. The factors are can be illustrated as follows

- Data provided
- Parallel systems
- Training and testing
- Expectations from the ERP System
- Employee Retention
- Design & Testing
- Customization should be less than 30%

Methodology and data collection

Initially, we must create a questionnaire to be used in conducting a survey across multiple construction companies. A questionnaire is a tool used to gather valuable information from various individuals for the purpose of data analysis. Questionnaires rely on the recipients' decisions and the answers they provide based on their genuine and personal perspectives. Questionnaires will be administered to various construction enterprises and construction groups in Pune to assess their organisational culture profiles and the extent to which they have applied quality procedures.

Personal Interviewing.

Self-Administered Questionnaires/Surveys.

In order to complete this section of the questionnaire, the target demographic is demanding accurate information from the company. There are no definitive answers to the questions, just as there is no absolute standard for what constitutes a correct or incorrect culture. It is anticipated that each organisation will possess an own organisational culture. Hence, it is imperative for each organisation to accurately disclose the fundamental beliefs and assumptions when filling out the questionnaires. The data submitted by individuals in various management levels in these questionnaires is highly confidential. The success of the ERP is heavily influenced by departmental processes, as well as the organisational and departmental structure. The survey involves visiting different departments and observing ongoing processes to identify any discrepancies between the requirements and capabilities of the ERP system and the processes/needs of the organisation

Companies Survey

The data regarding using ERP software is given in following chart
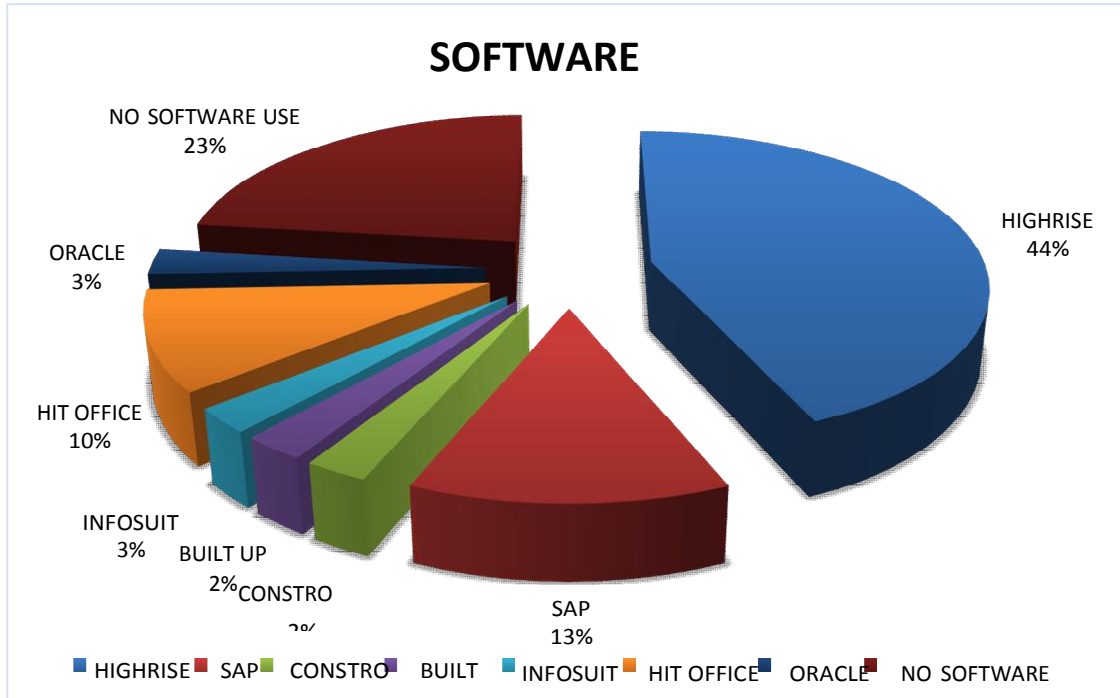
Figure No. 1 Pie Chart of Market Survey

From this market surveying which 30 construction companies was participate, we can conclude that the HIGH RISE is most commonly used in construction industry so that we can decide to do focus on HIGH RISE software.

Introduction to Highrise

Integrated software encompassing all the functional departments of the enterprise. High -rise consists of integrated functions of Accounts & Finance management, Sales & Marketing Management, Project Estimation & Planning, Purchase & Inventory Control, Contra cting Management, Human Resource Management, Quality Control, Lease & Mall Management, and Tender Management. All the above functions share common data thus makes the organization homogenous.

Advantage & Features of HIGHRISE Software

- Audit trails
- Built in knowledge banking
- Directly read CAD drawings
- Multilevel user security
- Direct connect to site using internet
- Connecting Sites Online

High-rise Web Modules provides the power to connect remote construction site online with the Head office using internet connectivity. The ASP.Net based application runs in internet browser from any part of the world. This enables to keep the business online at all times.

High-rise supports three tier structures of operations namely as Head Office, Branch Offices, Site Offices.

The state of art Financial Accounting Module follows Standard Accounting Practices (SAP) and helps break a Company Project-wise and see Balance Sheet, P & L, and Trail Balance & Cash Flow on one hand and view consolidated multi Company Balance Sheet, P & L, Trail Balance & Cash Flow on other hand

Case study and data Analysis

The company situated at Pune. This is one of the leading construction business conglomerates in Pune that has successfully completed over 30 projects. With more than a decade's excellence in developing innovative and futuristic residential and commercial landmarks. They are a name to reckon with Excellence, Ethics and Empowerment. Their plans, designs and structures are always inspired by their customer's aspirations. They identify, analyze and understand the changing lifestyle trends and offer projects tha t reflect this paradigm shift. Before implementation of HIGHRISE software, company were using MS- Excel software for daily work on site and off-site work.

During that period company faced so many problems such as

- Missing of documents
- Lot of paper work
- Delaying material purchase
- Delay for requirement etc.

Due to occurrence of these problems they initially preferred OTHER software [Name not mentioned here due to company policy]

After use of this software, they found that this software is not user friendly and it is mostly catering to Sales & Estimation purposes and this software does not fulfill all the requirements of company as an end to end solution

Challenges faced by company during the use of OTHER software

- Mismanagement –It is the main problem faced by the company
- Communication Problem- It is also challenge which is faced by company
- This problem is occurred in between labor and office staff
- Delay of materialon site-Work gate stopped due to lack of material that's way Duration of construction will be increases
- Wastage of material –This is another big problem which is faced by company
- Lot of paper work
- Missing of documents
- Requirements of labour is more
- They cannot handle all the data at one place
- This software is not accessible from remote area
- This software can not able to prepare work break down

Highrise Modules

Various moules used in Highrise software, but we decide to use following modules

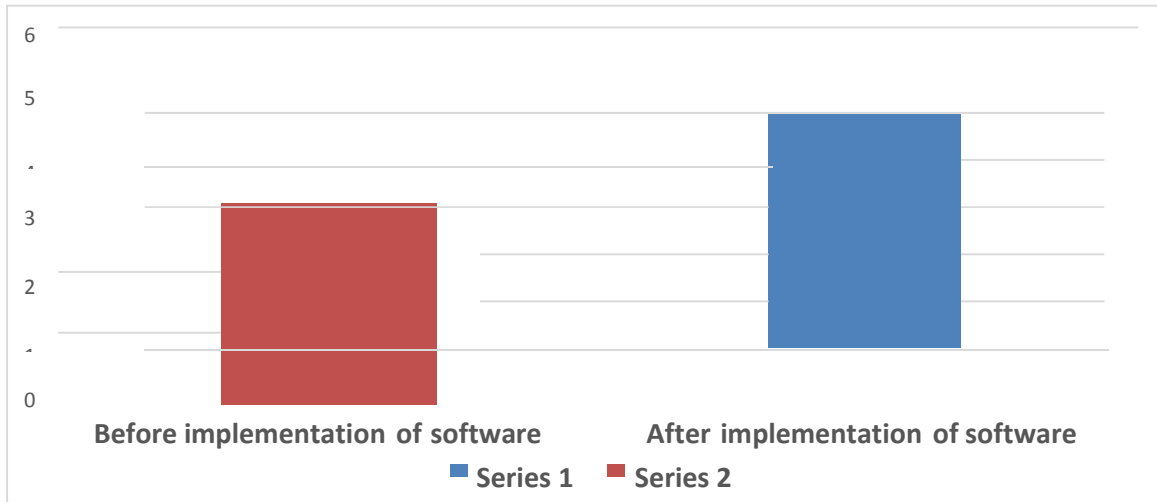|	
Engineering	Sales and Marketing
Material Management	Financial Account
Contract	

Departmental Structure:
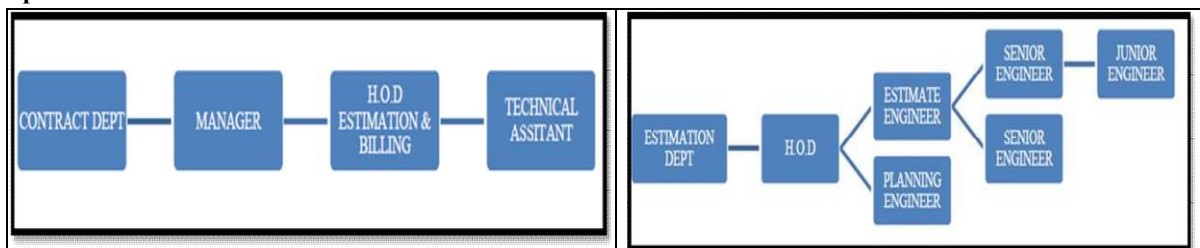
Departmental Structure of Contracts Dept.

**Departmental Structure of Estimation Dept.**

Fig 2 Departmental Structure of Contract and Estimate Department

Graph 1. Before and after development of company due to software in contract dept

This bar chart of contract department of company. This chart shows the situation of company before implementation of software and after implementation of software. After implementation of software the situation of contract department improved with better result. As compare to before implementation of software the result are approximate two times improved.
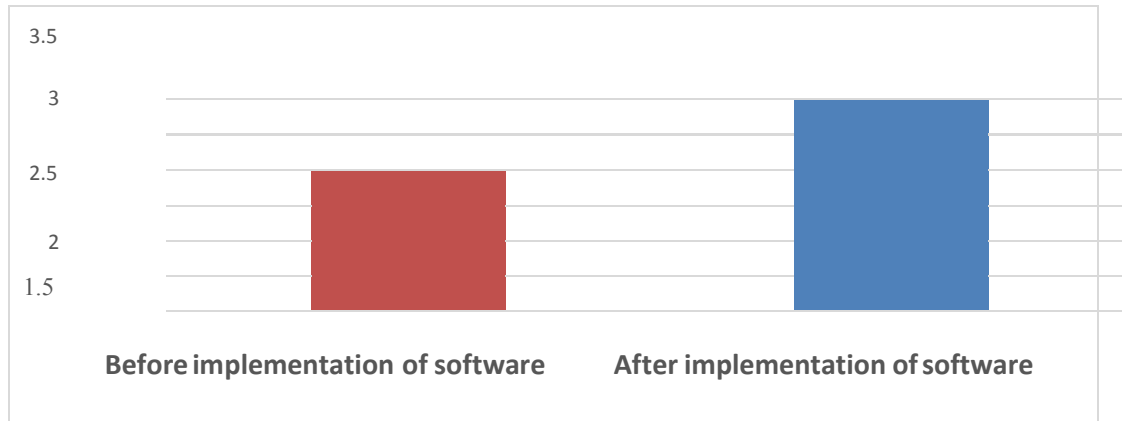
Estimation Department:
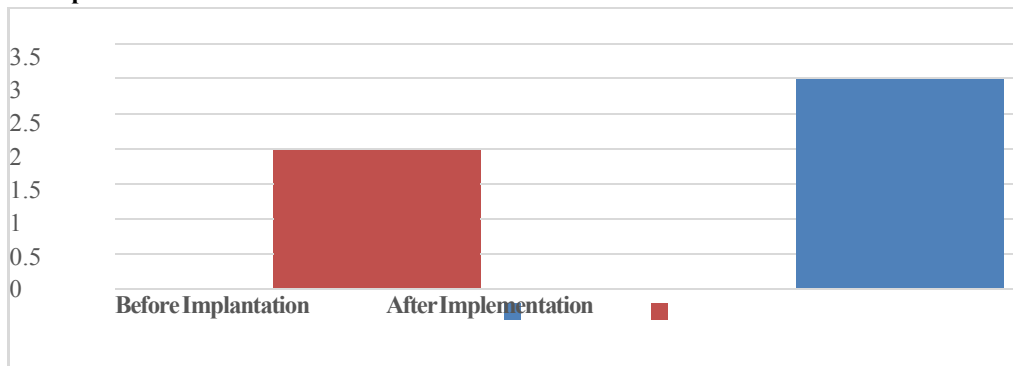
Graph 2 After and before in estimation department

This bar chart of estimation department of company. This chart shows the situation of company before implementation of software and after implementation of software. After implementation of software the situation of contract department improved with better result. As compare to before implementation of software the result are shortly improved

Purchase Department:

Figure No. 2 Departmental Structure of Purchase Dept.

Graph 3 After and before in structure and purchase department

This bar chart of purchase department of company. This chart shows the situation of company before implementation of software and after implementation of software. After implementation of software the situation of contract department improved with better result. As compare to before implementation of software the result are better improved.

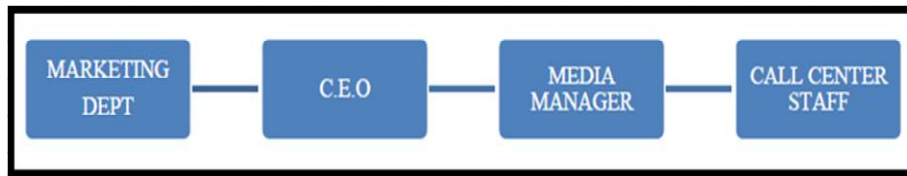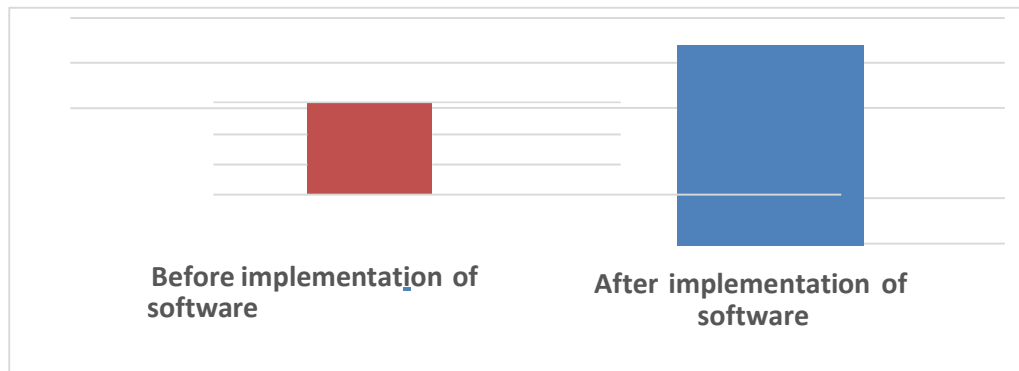Departmental Structure of Marketing Dept

**Figure No. 3 Departmental Structure of Marketing Dept.**

Graph 4 After and before in structure and Marketing department

This bar chart of marketing department of company. This chart shows the situation of company before implementation of software and after implementation of software. After implementation of software the situation of contract department improved with better result. As compare to before implementation of software the result are good improved

Recovery Department:

Figure No. 4 Departmental Structure of Recovery Dept
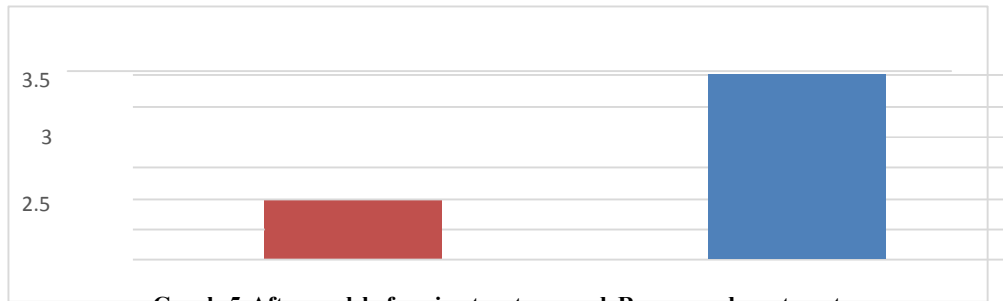
Graph 5 After and before in structure and Recovery department

This bar chart of recovery department of company. This chart shows the situation of company before implementation of software and after implementation of software. After implementation of software the situation of contract department improved with better result. As compare to before implementation of software the re sult are good improved.

Account department

Figure No. 5 Departmental Structure of account Dept.

before implementation of software   after implementation of software
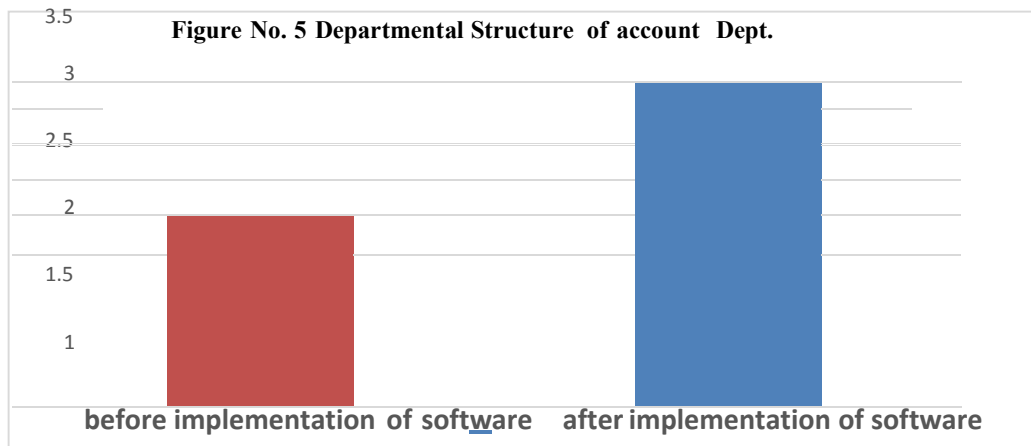
Graph 6 After and before in structure and Account department

This bar chart of account department of company. This chart shows the situation of company before implementation of software and after implementation of software. After implementation of software the situation of contract department improved with better result. As compare to before implementation of software the result are widely improved

III. CONCLUSION RECOMMENDATIONS FOR SUCCESSFUL ERP SYSTEMS

This result can be interpreted that in order to complete the ERP project on time and within the budget as initially planned, internal support including top management commitment, good project planning, and training would be mandatory as well as high-quality consultant support Based on the survey conducted and the inputs received from companies who had participated in the survey, the success ratio of implementing an ERP depends primarily on three factors:

1. Readiness of the company's management to move from manualsystem to an automated system:- This is a very important aspect, because the company's management should first understand their internal processes, their existing employees and their capabilities and the mindset of the employees whether they are ready to accept the change. A plan needs be prepared indicating the time frame for product evaluation, product implementation, availability of internal resources and the budgetary finance required

2. The ERP product capability: - With many ERP products available in the market from various price range, companies evaluating ERP should be cautious & show patience. The evaluation should be based on the following parameters: Product strength - ERP's standard product capabilities and functionalities available and mapping it with the requirements of the company.

3. Identify the areas where customisation is required Availability of regular upgrades Compliancy to Indian Governmental taxes, laws, statutory requirements

4. Success of the Implementation partner / vendor: - The success of an ERP implementation depends a lot on the vendor or the company that is implementing. It is very important to understand that vendor and evaluation of the vendor or the company implementing should be on the following parameters:

Domain knowledge and the skills of the consultants of the implementation team; the implementation consultants should be subject matter experts High-rise has inbuilt standard and best practices business process. High-rise software gives approximately 75-80% satisfactory result, as compare to other software. Through the usage of High Rise Software there is tremendous saving in construction cost as well as saving of material. From our report we can conclude that as compare to service sector, manufacturing sector, IT sector the construction industry is very complex and uncertain so for better management, accurate estimate, timely completion of project, for strategic planning, for better discipline and to follow the scientific way, to reduce the dependency on human resources etc. so now a days ERP software's are widely used in construction industry.

We were done the market survey in various construction company. From that survey we conclude that the high-rise software is most commonly used as compare to other software. High-rise is India's first and most successful specialize ERP for construction. It is rapid implementation process (RIP) methodology facilitates implementation in 45 days,with implementation guarantee. It is fully secured, provides configurable multilevel security, highly scalable also user friendly and easily adoptable. High-rise has inbuilt standard and best practices business process.

High-rise software gives approximately 75-80% satisfactory result, as compare to other software.

Through the usage of High Rise Software there is tremendous saving in construction cost as well as saving of material. Since the saving in material is being done the construction project becomes more economical & less time consuming which enables speedy constructions requiring limited employee with proper document management.

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