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A Review Study of Feasibility Analysis of ERP in Construction Industry

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Abstract – The success of the a building project is based on a variety of construction project factors. Among them, integration management is critical since efficient project administration starts with the connection of systems and processes inside a building project. This research explores and analyzes the influence of different integrated and comprehensive elements on the performance in the construction industry project managers. The link between those elements and integration management One of the suggested integration process components is the creation of connection process components. Knowledge integration, process integration, personnel assimilation, supply chain, and change integration are all part of the project charter. Program management performance in terms of time, cost, performance, safety, and client satisfaction. A questionnaire was developed and disseminated. Data from 121 projects was evaluated using structural equation modelling after construction experts were surveyed. SPSS AMOS analysis was used to analyze the data. The study's results indicate that knowledge area has a substantial influence on project management. performance. By providing a conceptual framework constituted of particular ideas, the research contributions to the body of expertise in project management. elements for project implementation, illustrates the influence of integration management practices on performance, and recommends numerous tools and tactics for successful integration across the project life cycle Professionals in the business may profit from the structure produced by putting into account the Following aspects have been provided and solutions have been advised for the building stages.

Keywords: ERP, Study, Construction, Structure, Management

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INTRODUCTION

Enterprise resource planning (ERP) is an abbreviation that refers for ERP (ERP). As a programme for managing and integrating the financial, supply chain, operations, commerce and reporting aspects of a company's business operations and human resources. One of the main goals of ERP is to bring together all of the company's multiple software programmes and databases into a single, integrated software package that can be used by all of the company's many departments. There are many different types of construction processes that ERP software can help you manage, such as accounting/financial reporting, contractor management, inventory control, human capital planning and development, and more. ERP software can also help you keep track of all of these different aspects of your company's operations, such as project timelines and costs as well as customer relationships. There are several ways in which ERP systems might assist a building company's work. ERP systems provide for better management of a firm since they connect all of its departments. Reducing mistakes and duplication are just a few benefits of using an enterprise resource planning (ERP) system. Packaged software applications with linked architectures used by enterprises to integrate data and process data in real time across their distribution chain are called ERP systems. ERP systems have become a vital element of today's businesses because of the positive outcomes they have produced. Compared to the industrial and service sectors, the construction business has its own set of difficulties to overcome. Effective resource allocation, planning, monitoring, and most crucially, information exchange is needed to meet this demand. Organizations in developing nations are hesitant to implement ERP systems because of their particular needs and the restricted availability of new industry technology in these areas.

1.1 What is Enterprise Resource Planning (ERP)

Logistics, production, finance, accounting, and human capital are all included in an ERP system, which is a comprehensive corporate management tool. In order to make the most efficient use of resources including people, materials, money, and machines, it organises and integrates various operational processes and data flows. The promise of Enterprise Resource Planning is that it would

unify the diverse systems that formerly governed production, distribution, finance, and sales under a single database, application, and user interface. Incorporating data from every department, it helps workers and managers plan, monitor, and govern the whole organisation. With a contemporary ERP system, a factory can better plan output, maximise capacity, and minimise inventory while still meeting delivery deadlines. The management of physical assets, economic ability, materials, and human capital are all part of this computer-based system. In order to simplify the flow of information across all business units inside the firm and manage the links to external stakeholders, this is a computer design that is designed to do just that. ERP systems, which are based on centralised databases and often make use of a single computer platform, bring together all aspects of a company's operations under a single, standardised framework.

Fig . 1 Construction project management

Benefits of ERP

Following are some of the benefits they achieved by implementing the ERP packages:

- Additionally, it allows Accounts Payable staff to take greater control of billing and payment processes, increasing efficiency and reducing their dependence on computer staff.
- Reduce paper papers by offering on-line methods for inputting and retrieval of information rapidly.
- The ability to upload information on a daily basis instead of once a month improves the accuracy of information.
- The auditors were pleased with the information's correctness and thoroughness, as well as its presentation.
- Cost-cutting measures have been taken.
- Improved customer response and follow-up.
- Improved cash collection, such as a significant decrease in consumer payment delays.
- Monitoring and resolution of inquiries will be improved.
- Facilitates rapid responsiveness to changes in corporate processes and market circumstances.
- A competitive advantage may be gained through strengthening the company's business process.
- It makes it easier to connect distant sites and branches in other countries to the supply and demand chain.
- The ability for all apps to access a single customer database is provided.
- Support for numerous tax structures, billing methods, currencies, multiple periods of accounting, and languages helps international businesses run more smoothly.
- Access and management of data is improved at all levels of organisation.

Disadvantages of implementing the ERP systems

- Workforce skills and knowledge, as well as education and ability to correctly implement systems, are critical to a company's success.
- Resistance to exchanging internal information across divisions may lower the software's performance.
- Using the systems might be a challenge.
- When a corporation hires an administrator who is not educated in the ERP plan of the organisation they work for, the administrator may propose changes in business practises that conflict with system.
- ERP systems provide numerous benefits, but they do not ensure the company's success. Organizational culture, employee involvement, and anticipating the changes that will occur as a result of implementing this management system are all critical to the implementation's success.
- Resistance to sharing information across corporate divisions or departments may reduce the ERP system's performance. There may be employees who are under-trained or uninterested in working with the

ERP system because of the radical shifts in the workplace culture brought about by its installation.

- Having an Erp solution has long-term advantages that aren't immediately apparent when the programme is put into operation.

- ERP system installation costs a lot of money. The cost of ERP consultants is roughly 60% of the total expenditure.

Engineering Module

SAP is an all-purpose accounting and financial management system that can be used across a wide range of industries. Departments like Sales & Marketing, Project & Planning, Purchasing, Contracts, Human Resources, and Quality Control may all work together seamlessly with this system. Many users and a significant amount of data are no problem for this programme.

The processes involved are:

√ Specify the project, WBS, and deliverables

√ Rate analysis definition

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√ Prediction (directly converting CAD drawings)

√ Re-estimate and maintain versions of the project

√ Scheduling and planning of the project

√ Costing and budgeting for a project

√ Quantity and Cost Variance Calculation based on Activity and Material Variance

√ At the task level, quality checks are implemented via quality check lists.

√ Profitability:

√ document control and management at the central level

√ Assuredly accurate estimates

√ Controlling and managing change more effectively

√ Project planning, implementation and monitoring must be accurate

√ Achieving real-time data availability and improved management direction

√ Alerts and escalations for any aberrant activity; prevent post-mortem investigations

√ Project completions on time and at a high standard of quality

1.2 Benefits of ERP for the construction industry

1. Automation of operations

There is a lot of construction going on at once. Project management, customer handling, employee management, cost estimating, and procurement are just few of the functions they do. As the firm grows, so does the scope of all of these activities. Because of this, it is an immense task for company managers to maintain perfect management.

However, using an ERP solution makes the process much more straightforward. ERP modules eliminate human error by automating and managing all activities with extreme precision.

2. Optimization of project management

In the lack of suitable project management, no construction business will be able to endure its life span or secure long-term clientele. Delays in delivery or construction errors may have long-term consequences, even for small flaws. It's possible for the business to properly handle numerous projects simultaneously using ERP software suppliers, but Better project optimization is made possible by the ERP program's selection and use of optimal resources at precisely the correct moment and in precisely the ideal location. This also entails a reduction in expenses and an expansion in revenue.

3. Effective internal communication

Project deadlines may be missed if all departments don't communicate well.

As a result, we need an ERP system supplier that can help us increase internal communication amongst our numerous divisions. Any ERP tool's built-in chat forums with video interactivity have a significant influence. Discussions may be started by any member of a project's team, or by anybody interested in the topic of the project. This method ensures that all of the relevant parties are informed at the same time and without delay.

4. Mobile friendly

ERP software suppliers are making their products mobile-friendly. As a result of the ubiquitous nature of mobile devices, this is the case. The company's entire operations are accelerated thanks to mobile access to project-related information.

Use of SMS notifications and bulk SMS communication is a key component of ERP

software's mobile-friendly feature. The access of ERP on a mobile device ensures that real-time update of the project keeps taking place from every project site.

5. Indicates a presence that is constant and available at all times

It is impossible for any project to be delayed due of the absence of a single resource thanks to ERP software. As a result, it guarantees that each and every member of the project team has access to all of the relevant information at the right moment. It signifies a 24-hour presence in business. No matter where you are on the site, you can always get to the papers you need on your mobile device or laptop, no matter where you are. Employees will also benefit from this, since they will be able to work more or less as they see fit.

6. Ease of transferring data

The construction sector, as previously said, involves a large number of simultaneous activities and documentation. As a result, corporate leaders have increased difficulty in effectively managing and allocating data. This becomes increasingly difficult as the scale of the company increases.

Professionals in the construction business benefit greatly from ERP database management since it efficiently centralises data of any size. It also makes it possible for data to be safely and quickly transferred across various divisions within a company. As a result, locating certain records is quick and easy.

7. Effectiveness in making decisions

All company choices may be made quickly and accurately thanks to excellent consolidation of data and processes. Preventative measures may be taken to avoid bottlenecks.

8. A more effective approach to marketing

A comprehensive data analysis provided by an ERP programme aids in the improvement and optimization of marketing tactics. Various departments' data is gathered and Strategic objectives may be developed and implemented by analysing data on a shared platform.

9. Preliminary cost and revenue estimates for construction projects.

Marketers in the building trade must submit bids for contractual projects. There will be only one winner in this competitive bidding process. These cost estimates are made using ERP software. An accurate cost estimate may be made using the resources that will be employed and other pertinent information. It also helps in figuring out the project's operating costs. The construction industry benefits from AI-based ERP by reducing the gap between actual and estimated costs.

10. There are ten things to keep in mind when it comes to

The implementation of ERP reduces the amount of paper that is used to keep track of information. The digitally saved data may also be accessed at any time and from anywhere. Additionally, unauthorised individuals will have less opportunity to gain access to documents, ensuring the privacy and secrecy of sensitive information.

1.3 Problem Statement

"To Study the Feasibility Analysis of ERP In Construction Industry"

1.4 Objectives of the Study

- ► To study ideas of ERP in construction project.
- ► To study current standing of typical procedures.
- ► To establish practicableness of ERP.
- ► To establish edges of ERP over typical procedures.

1.5 Scope of the Study

The scope of this paper is to study and implement construction ERP software for an organization paper is mentioned point wise as follows:

- ► To study scope of ERP software's in Construction Industry.
- ► To analyze process flow of ERP software's in construction.
- ► To implement the ERP system and study the success factor for ERP software.

2. LITERATURE REVIEW

2.1 Cheng, Jack CP (2011)

To learn, The substantial fragmentation of the building sector makes supply chain integration difficult. Participants with a diverse variety of hardware and software capabilities share information, applications, and services. As a result, participants in construction projects are typically reluctant to provide knowledge because of the transient nature of the work. The need for a safe, modular, and adaptable system that is able to gather and distribute information across applications is consequently significant. Both of these

characteristics can be provided by a service-oriented, web-based system that we have prototyped.

2.2 Paul Arnold (2013)

In It is clear from this study's findings that data reentry is a prevalent problem when it comes to using PMSS, and that future construction ICT improvements should concentrate on making the PMSS more collaborative, project-based, and accessible to all project team members. A collaborative PMSS deployment strategy, however, may be hindered by governance difficulties. According to the responses, general contractors should continue to serve as the PMSS's administrators and controllers.

2.3 Sevilay Demirkesen, (2017)

There is value in developing a conceptual framework with particular components for integration as part of this research, which adds to the corpus of project management knowledge shows the influence of integration management on performance, and presents many tools and tactics for facilitating successful integration across the project life cycle. The success of a construction project depends on a variety of factors, including project management. Because efficient project management begins with the successful integration of processes and people inside a construction project, the significance of integration management cannot be overstated This research explores the impact of different integration management components on the performance of construction project management and quantifies the link between these components and integration.

2.4 Laith HADID, (2017)

It is the goal of this study to create a decision-support tool that aids in the prioritisation of the adoption of ERP systems. The research suggests that ERP adoption in the construction sector is very susceptible to failure. ERP deployment in the construction business may be done successfully with the help of this study's methodical methodology. This study's ERP implementation methodology benefits construction organisations throughout the globe and Saudi Arabia in particular.

2.5 Jui-Sheng Chou (2012)

Project performance, customer satisfaction, and project success are examined in this research by examining the effectiveness of management approaches, tools, and skills for executing infrastructure and building construction projects.. Experts from commercial and public engineering businesses filled out a questionnaire, which was then evaluated using a structural equation model. The findings of the study support the notion that the PMBOK® Guide should be given top priority in the building sector.

2.6. Saumyendu Ghosh, (2010)

The purpose of this research is to consolidate existing literature on ERP deployments' potential connections to CSFs, define difficult projects, and compare ERP to project management has an influence. It is possible to determine the degree of project complexity involved in any ERP deployment by an examination of the most probable CFS and RFs listed in the literature. Due to the fact that it is based on a literature evaluation, this research is classified as exploratory. Future study should involve data collecting from ERP users and long-term analysis of trends based on advancements in ERP project management and governance capabilities in diverse ERP deployments.

2.7 Young Hoon Kwak (2012)

It is the goal of this research to provide an alternate perspective on ERP acceptance by users. End-users' and various organisational settings' views on ERP system adoption continue to be investigated empirically despite the enormous body of research. An ERP system's end-users' cognitive view of the system and their behavioural desire to utilise it are of interest to us, hence we focus on project-based industries as our target demographic.

2.8 Eziyi O. Ibem (2014)

Web-based apps that promote real-time communication and cooperation throughout the building supply chain represent the majority of current digital technologies, according to the report. As a result of this endeavour, the current debate on the use of digital technology in construction procurement has been enriched. It's noteworthy to note that, despite technological advancements in construction, no one digital technology has yet to combine all six procurement processes into a system that buyers can use to manage the whole procurement lifecycle in construction.

2.9 Christoph Merchbrock (2012)

This article provides an overview of the research on BIM in the construction industry building, with the goal of finding areas in which IS research might make a difference. In order to facilitate collaborative and integrated building design, construction, and operation, BIM utilises a set of IT technologies. Many current procedures, organisational roles, contractual norms and collaboration arrangements in the building industry will have to be rethought to accommodate this new integrated construction strategy. We discovered that BIM research encompasses a broad range of technical and organisational concerns, many of which have a direct connection to IS research foci. IS acts as a reference discipline, and the ideas employed in IS

research are now being applied in modern BIM research, according to our findings.

2:10 Me'xas, Mirian Picinini (2012)

Methods for evaluating these systems have been discussed, taking into consideration a variety of perspectives and assessment criteria. ERP system selection criteria and subcriteria for enterprises in the construction sector are suggested after a study of the literature on the deployment and use of multi-criteria models for the assessment of ERP systems.

2.11 Hande Aladag (2016)

Changes in business circumstances owing to globalisation, increased technology, altered client expectations, and other factors are discussed in this article, which leads to an increase in competitiveness in the construction sector. In this setting, construction businesses must keep up with the times in terms of technology and innovation in order to be viable in the long run. For the construction industry's success, innovative techniques such as information technology (IT) must be applied in construction. The use of BIM technologies, including as CAD, Revit, and SAP2000, as well as enterprise resource planning (ERP) and data management software, has marked a significant change in the construction industry's approach to managing the mutual relationships across various disciplines.

The consideration of the rising complexity of construction projects in design, bidding and construction as well as extra advantages on change control, repeatability, energy efficiency, health and safety, risk and quality management in addition.

2.12 Bilal (2016)

An interdisciplinary assessment of the literature in the disciplines of statistics, data mining, data warehouses, machine learning, and Big Data Analytics is presented in this work to address a gap in the literature. 24 Discussing Big Data in the 25 construction business, we look at how it is now being used, as well as its future potential across a wide range of 25 sub-specialties within the broader construction sector. In addition, we identify 28 unresolved concerns and possible hazards linked with Big 29 Data adoption in the sector.

2.13 Ibrahim Younis (2019)

A thorough evaluation and synthesis of 39 empirical studies on the dangers of MiC were undertaken and 30 CRFs were found. Top 10 CRFs in MiC have been analysed based on their frequency of appearance in the application. The five most common CRFs are: stakeholder fragmentation and management complexity; higher initial capital costs; inadequate supply chain integration and disruptions; delays in the delivery of modular components to the site; and insufficient government support and regulations.. The results are relevant to nations that have not yet adopted MiC and may help researchers and practitioners better understand the hazards of MiC. Future research would score the CRFs numerically and provide management solutions.

2.14 Nenad Cus Babic (2019)

The results of a research and development project carried out at the Construction IT Centre of the University of Maribor are presented in this paper, which deals with the introduction of a building information model (BIM) and a model-based construction process into the operational environment of a construction firm. Initiated by the construction sector, the project was carried out in collaboration between a research institute and a construction firm.

2.15 Christoph Merschbrock (Germany) (2015)

The purpose of this article was to do research. Building information modelling (BIM) and other digital technologies may help the design, engineering, and construction sector become more transparent, more integrated, and more productive. Despite this, many project teams have difficulty adapting to new technologies. Using shared information systems like BIM for collaborative design calls for a shift away from long-established routines and procedures. A big hospital facility's integrated BIM design case study

CONCLUSION

An overview of the literature on "An ERP Feasibility Analysis in the Construction Industry" was covered briefly in this chapter. According to a literature research, the use of ERP in the optimization of building processes was discussed in the review of the literature.

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