

Application of ERP in Construction Project

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Abstract- India has finally fallen into the groove as far as globalization is concerned. This has led to the domestic large and medium sized companies embrace standards and processes that measure up to global standards. It has become more the reason for IT solutions vendors to cheer up looking at the requirements of the Indian market. Statistics reveal that there has been a significant increase in the IT spends of Indian companies in the last few years. ERP was one of the first IT concepts to hit the Indian construction market, although with meagre success. Enterprise Resource Planning (ERP) is software driven business management system, which integrates all facets of the business, including planning, execution, sales, and marketing. The business environment has become increasingly complex and the marketplace has changed from local to global. Management is under constant pressure to improve competitiveness by lowering operating costs and improving logistics. Organizations therefore have to be more responsive to the customer and competition. And ERP as a business solution aims to help the management by setting better business practices and equipping them with the right information to take timely decisions.

I. INTRODUCTION

ERP is a computer based system that attempts to unify all systems of departments together into a single integrated software program based and uses a single database so that various departments can more easily share information and communicates with each other. Enterprise Resource Planning (ERP) software is a business solution that provides powerful analytics using data from various construction processes such as accounting/financial management, contractor management, equipment/inventory management, human capital management, project management, vendor management, bid management, Customer Relationship Management (CRM), scheduling, submittals, asset management, and more. ERP systems can support a construction company's work in many ways. Since ERP systems integrate all parts of a company seamlessly, more proper control is possible. ERP systems are able to minimize redundancy of data, control the data produced by different departments and reduce data registration errors. ERP system are sets of packaged application software modules with integrated architectures used by organizations integrating data

and processing information in real time across their supply chain. The results derived from implementing ERP system have made them essential part of today's organization. The construction industry presents a unique set of challenges different from those of the manufacturing and service industries. This creates a demand for effective resource allocation, project planning, employees tracking and most importantly information sharing. Due to their unique requirements, and the very limited availability of construction industry software in developing countries, organizations in these countries are generally reluctant to adopt ERP systems.

A. Enterprise Resource Planning (ERP)

An Enterprise resource planning system is a fully integrated business management system covering functional areas of an enterprise like Logistics, Production, Finance, Accounting and Human Resources. It organizes and integrates operation processes and information flows to make optimum use of resources such as men, material, money and machine.



Fig 1 Enterprise Resource Planning

B. OBJECTIVES

- 1) To study concept of Enterprise Resource Planning (ERP) in construction project.
- 2) To study implementation of ERP- Case Study.
- 3) To analyze implementation of ERP in construction project.
- 4) To discuss the results of implementation of ERP.

II. CONCEPT OF ERP IN CONSTRUCTION PROJECT

Generally material management is concerned with the planning, identification, procuring, storage, receiving and distribution of materials. Material management covers a much wider field and deals with all aspects of material supply, utilization as well as costs. It is a body of the knowledge which helps the managers to improve the productivity of capital by reducing material costs preventing large amount of capital being locked up for larger periods and improving the capital turnover ratio. Material management is therefore a total concept involving the overall organizational structure. It can also be defined as the procurement of right quantity of materials, at the right quality from the right source, at the right time, for the right price.

A. Process of Material Management

Material management process initiates from need generated from site then this information conveyed to store department and material is ordered in the store, indent is generated. Vendor selection is to be carried out for the least value and best times. Materials are received at store department and inspection is carried out.

B. Working of Modules of ERP for Inventory In Construction Industry

The process starts from calculating quantities and preparation of estimate of the project with preparing resources, work item specification and rate analysis. Measurement planning is done with LBD measurements formula and direct quantity. Estimation is imported in project. In the project planning bar chart preparation, material quantity planning is carried out. In the process of project execution work is completed related with inventory. The process such as requisition of material, price request, and comparison, purchase order material inward entries on daily basis, issue slip entries and register of site bills this all process is carried out. After project billing with supplier, subcontractor and client billing, reconciliation reports are made

III. STUDY AREA

NITHYAM BY GADA GROUP, CHAROLI

Located at the sacred land of Alandi, Nithyam promises comfort with convenience. Our 1 & 2 BHK cozy and comfort homes offer the work-life balance for you. Alandi is one of the fastest growing areas of Pune, an important commercial hub. Located in a place surrounded by ample greenery, Nithyam is the quintessential dream home of many.

It offers easy connectivity to prime places of leisure and entertainment in the city. Then comes the distinct price advantage. In spite of being located close to big townships, Mantra Park View is economically priced. Chakan MIDC, Sant Dyaneshwar temple, all of them are close by. A home here provides easy access to lifestyle amenities due to its proximity to prime educational institutes, banks and daily utility stores.



Fig 2 3D view Nithyam from outside, Charholi

IV. ANALYSIS AND STARTING WITH DATA COLLECTION

- A. Items List and supplier list update in ERP**
- B.**

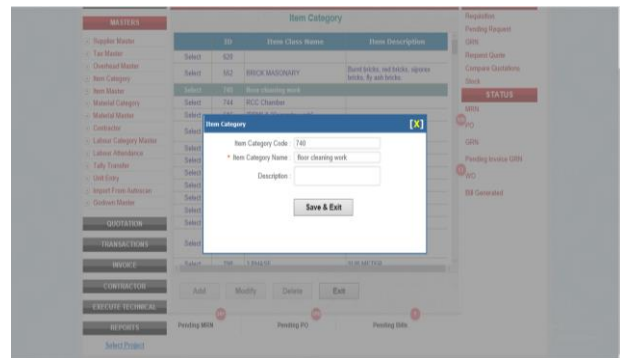


Fig 3 Add items as per list in ERP

B. Supplier List update in ERP

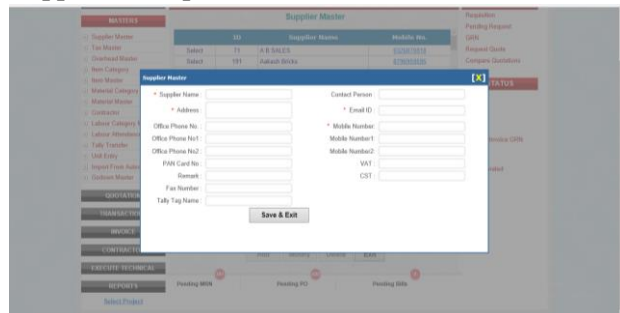


Fig 4 Add Suppliers in ERP

C. Labour category and list

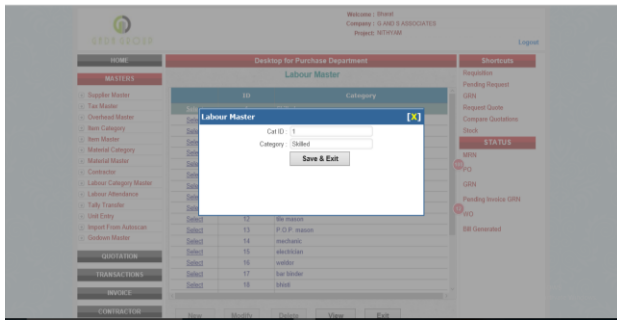


Fig 5 Add and Modify labor list in ERP

D. Work Order Report

G AND S ASSOCIATES
 201, Sai Siddhi, 2nd floor, Behind Congress Bhawan,
 Bhandra, Mumbai - 400005

Work Order
 Wo. No. : NITH000063

Contractor Name : Square 9 Corporation Pvt Ltd
 Siddhi Tower, Office No.10, 4th floor,
 Kondhwa Khurd, Pune - 411058.

Contractor : Square 9 Corporation Pvt Ltd
 Name : Square 9 Corporation Pvt Ltd
 Seal: _____
 Checked By: _____
 Authorised Signatory: _____

Contract Ref No : 7774060009
 Contact No : 7774060009
 Contact Person : Siddharth Shah
 PAN : AATCS8532R
 TAX NO :
 VAT :

Wo. No. : NITH000063
 Wo. Am. No. : FINL000000
 Wo. Date : 7/3/2018 12:00:00AM
 Tender Ref No :
 Site Name : NITHYAM
 Site Address : Survey No. 1/2/34/5,
 Charoli Khurd, Alandi,
 Pune 410501

Please execute the work as per terms and condition mentioned here in

Sub Total	Discount	TDS	Tax	Total Amount
83,582,235.00	0.00	0.00	0.00	83,582,235.00

In Words : Eighty-Three Million Five Hundred Eighty-Two Thousand Two Hundred Thirty-Five Only

Fig 6 Sample work order report

E. Overhead Masters in ERP

	ID	Overhead Name	Overhead Percentage
Select	00001	No Oh	0.00
Select	00002	Water Charges	1.50
Select	00004	Transportation	0.00
Select	00006	Overhead 5	22.00
Select	00008	Hamali	2.00
Select	00009	Loading	1.00
Select	00010	Unloading	1.00
Select	00011	Tools And Plants	1.50
Select	00012	Overhead And Profit Charges	15.00
Select	00013	Water Tools And Plants Profit And Overhead	18.00
Select	00014	Tools And Plants Curing Profit And Overhead	21.00
Select	00015	Water Tools And Plants And Overhead	

F. Purchase Order (PO) & Material Requisition Note

Purchase orders (POs) are documents sent from you, as the buyer, to a supplier with a request for products or services as an order. Each PO will include a number for tracking the purchase order throughout the system, as well as the type of item, quantity, and agreed upon price. More specific orders will include more details, but as a general rule, the more information you include, the more effective you're PO.

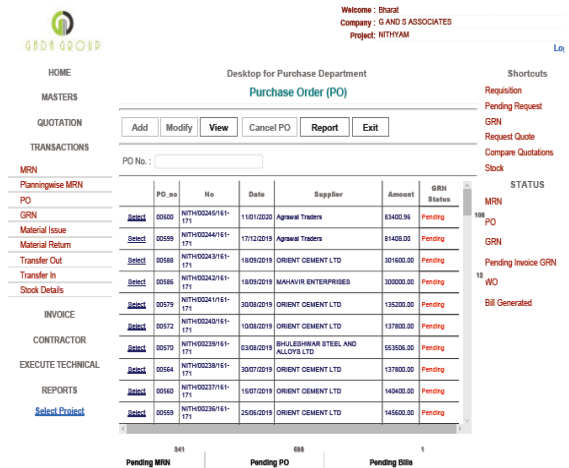


Fig 7 purchase order

Welcome : Bharat
Company : G AND S ASSOCIATES
Project : NITHYAM

Desktop for Purchase Department

Status

Pending PO Approval

PO User ID	Supp_Name	Director_Approval	Head_Approval	PO_date	PO_No
NITHY001516-17	JARY GLASS VENEERS	N	N	10/29/2016	0006
NITHY001716-17	SAPPHIRE SALES CORPORATION	N	N	12/09/2016	0007
NITHY001216-17	INDIA CABLES.	N	N	12/05/2016	0006
NITHY000316-17	INDIA CABLES.	N	N	11/16/2016	0004
NITHY000516-17	INDIA CABLES.	N	N	11/19/2016	0004
NITHY0012016-17	INDIA CABLES.	N	N	11/16/2017	0028
NITHY000316-17	INDIA CABLES.	N	N	03/14/2017	0016
NITHY000916-17	INDIA CABLES.	N	N	12/29/2016	0047
NITHY002616-17	G S ENTERPRISES	N	N	01/04/2017	0009
Anim001216-17	CHETAN ELECTRIC TRADING COMPANY	N	N	05/23/2017	0019
NITHY000316-17	Agarwal Agencies	N	N	02/14/2017	0014
NITHY001416-17	Agarwal Agencies	N	N	12/29/2017	0020
NITHY002216-17	Agarwal Agencies	N	N	02/26/2019	0032
NITHY000516-17	Agarwal Agencies	N	N	12/15/2016	0049

Summary: Pending MRN: 341, Pending PO: 508, Pending Bills: 1

Fig 8 Purchase Order Status

V. CONCLUSION

- It is concluded that ERP is a software which is used to centralize all systems of various departments together into a single database so that various departments can more easily share information and communicate with each other.
- To keep more proper control over all parts of a company seamlessly, ERP is useful.
- ERP systems are used to minimize redundancy of data, control the data produced by different departments and reduce data registration errors.
- A construction ERP system has ability to schedule construction activities accurately, scale back inventory and meet secure system.
- It is observed that the many construction firms in Pune have awareness about the ERP systems but very few of them have implemented such systems. The reason behind this is the implementation of any ERP system requires a huge investment in time, money and resources.
- The enterprise resource planning software market has been growing at a very fast pace over the last few years and has been predicted to keep growing rapidly in the long term.
- The results derived from implementing ERP system have created them essential a part of today's organization.
- ERP systems integrate all elements of a company seamlessly, additional correct management is possible for the project.

- Construction ERP is an ultimate solution to manage entire enterprise under a single roof.
- Results of various ERP processes gives a huge data of the project in just some clicks which can be used to minimize time, to manage resources, to perform scheduled activities on time, etc.
- Overall conclusion of the study is though ERP has huge initial investment cost, it is very useful to coordinate, to manage the construction project.

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