

Implementation of ODOO ERP for Business Applications

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Abstract: Every Small, medium-sized and large businesses enterprises require an in-house ERP software for running its business smoothly. A framework catering to the solutions for their business requirements. Also, companies look for open-source ERPs which are free to use/modify and have lower costs with large scope for development and customization. "ODOO" (formerly known as OpenERP) is one such open-source ERP software framework most widely used by different companies across the globe. The organizations belonging to different industry domains world-wide such as Information Technology, Manufacturing, Retail, Education, Health care, Publishing, Travel, Transportation and Logistics, opt for the development and customization of "ODOO" ERP applications. This paper analyses the optimum benefit of "ODOO" for the various Industry sectors. As ODOO is very contemporary technology very few papers are available but there are many web articles available to describe the need of this study done which are done for this paper.

Keywords: "ODOO" ERP, Open Source ERP, ERP for Business Application, ERP Business App, ERP for SME

I. Introduction

1.1 ERP Defined

The term ERP stands for Enterprise Resource Planning. It refers to the systems and software packages that organizations use to manage daily business operations, transactions and activities related to Sales, CRM, Purchases, Accounting and Finance, Manufacturing, Project management and other business modules. ERP systems tie together and define a pool of business processes and enable the flow of data between them. ERP systems collect shared transactional data of an organization from different possible sources and store, manage and analyze, interpret this data related to multiple business activities. They help to eliminate data redundancy and duplication and provide data integrity with a "single source of truth."

ERP refers to business-management software which is a suite of integrated applications related to core business processes all under one roof. It provides complete visibility to all the vital and significant processes across various functional departments of an organization. It manages these business processes in real-time and mediated by software and technology.

An ERP system's objective is to integrate back office processes related to different business modules and enable necessary flow of information within an organization required to make data-driven business decisions. ERP systems assist in improved internal and external business communication. These systems can be customized and extended to provide Business intelligence functionalities that can provide high-level insights on existing on-going business processes and hence can help to solve problems and identify potential areas of improvements. Having a structured approach to build ERP systems in line with the business processes of a company can help the company to setup standard and automated business processes and their effective management. This will ensure that everyone is working with the same relevant data and executes the business processes as per the same key performance indicators (KPIs).

1.2 "ODOO" - An Open Source ERP

"ODOO" (formerly known as OpenERP) is one such open-source ERP software framework most widely used by different companies across the globe. "ODOO" provides numerous modules and business applications under one-roof such as Sales, Purchases, Warehouse, Accounting, Human Resources, Helpdesk, Manufacturing, Project Management, Website/ECommerce etc. – helping to record the business data and transactions, tracking their status, enabling integration and inter-relationships between different business modules, developing and optimizing business workflows, developing dashboards and deriving Reports to track the progress of business operations from Management perspective.

The organizations belonging to different industry domains world-wide such as Information Technology, Manufacturing, Retail, Education, Health care, Publishing, Travel, Transportation and Logistics opt for the development and customization of "ODOO" ERP applications as per their needs and client requirements which helps them to boost their Sales and increase the CRM in turn accelerating the business processes and helping to

achieve the organizational goals and objectives. Example: Toyota uses “ODOO” to solve their operational challenges and simplify their workflows.

1.3 The “ODOO” Architecture

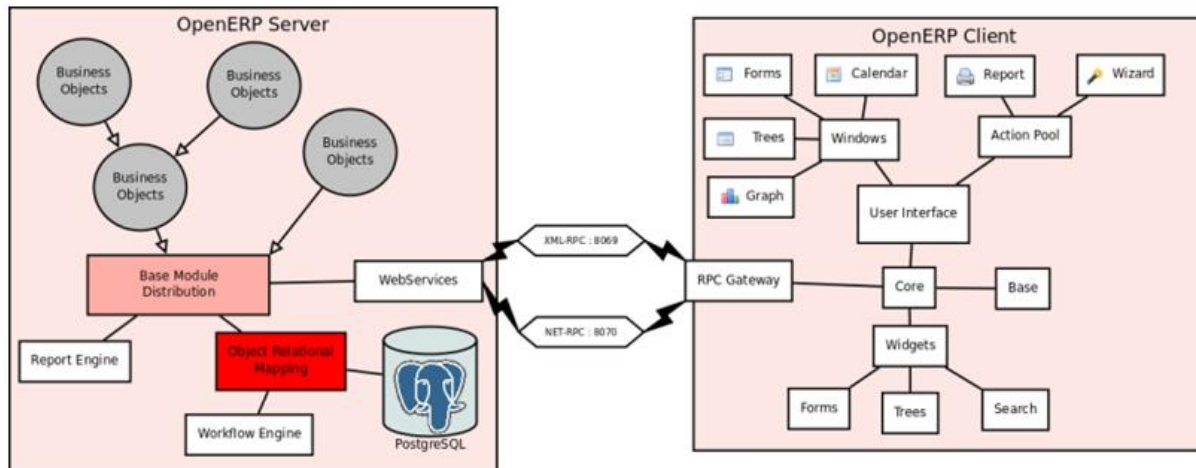


Fig. 1.3.1 “ODOO Architecture” Source: doc.ODOO.com

1.3.1 Overview

“ODOO” is a multitenant three-tier architecture. The application tier itself is written as a core, multiple additional modules can be installed to create a particular configuration of “ODOO”.

The core of “ODOO” and its modules are written in Python (programming language). The functionality of a module is exposed through XML-RPC (and/or NET-RPC depending on the server's configuration). Modules typically make use of “ODOO’s” ORM to persist their data in a relational database (PostgreSQL). Modules can insert data in the database during installation by providing XML, CSV, or YML files.

1.3.2 The “ODOO” Server

“ODOO” provides an application server on which specific business applications can be built. It is also a complete development framework, offering a range of features to write those applications. The salient features are a flexible ORM, a MVC architecture, extensible data models and views, different report engines, all tied together in a coherent, network-accessible framework. From a developer perspective, the server acts both as a library which brings the above benefits while hiding the low-level details, and as a simple way to install, configure and run the written applications.

1.3.3 “ODOO” Modules

For any enterprise, the value of “ODOO” lies in its different modules. It is the role of the modules to implement any business needs. The server is only the necessary machinery to run the modules. A lot of modules already exist. Examples of modules are Account, CRM, HR, Marketing, MRP, Sale, etc.

A module is usually composed of data models, together with some initial data, views definitions (i.e. how data from specific data models should be displayed to the user), wizards (specialized screens to help the user for specific interactions), workflows definitions, and reports.

1.3.4 “ODOO” Clients

Clients can communicate with an “ODOO” server using XML-RPC. A custom, faster protocol called NET-RPC is also provided but will shortly disappear, replaced by JSON-RPC. XML-RPC, as JSON-RPC in the future, makes it possible to write clients for “ODOO” in a variety of programming languages. “ODOO” S.A. develops two different clients: a desktop client, written with the widely used GTK+ graphical toolkit, and a web client that should run in any modern web browser.

As the logic of “ODOO” should entirely reside on the server, the client is conceptually very simple; it issues a request to the server and display the result (e.g. a list of customers) in different manners (as forms, lists, calendars, ...). Upon user actions, it will send modified data to the server.

1.3.5 Relational database server and ORM

The data tier of “ODOO” is provided by a PostgreSQL relational database. While direct SQL queries can be executed from “ODOO” modules, most database access to the relational database is done through the Object-Relational Mapping.

The ORM is one of the salient features mentioned above. The data models are described in Python and “ODOO” creates the underlying database tables. All the benefits of RDBMS (unique constraints, relational integrity, efficient querying) are used when possible and completed by Python flexibility. For instance, arbitrary constraints written in Python can be added to any model. Different modular extensibility mechanisms are also afforded by “ODOO”.

II. Literature Review

The well programmed to help customization and manage all business application with different business needs is accomplished by ODOO’s business apps[5] says in its review on the technical website of *project-management.com*.

As per Hieu Le[6], Implementation of ERP projects, especially long-term projects, requires the ability to scale up, to extend gradually depending on the initial requirements of clients and their increasing needs through the time. The source code of ODOO which is open source and designed for scalability, each application is a separate module which can be installed when needed.

ODOO is a multiplatform and supports Windows, Fedora, CentOS, RHEL, and others says Robin Muilwijk, Jan 2015[7]. ODOO is a very good tool to help multiple users to work on proposals as well as minutes of meeting simultaneously while allowing users to send email too. ODOO being a licensed software helps developers with their requirement as well as in documentation. It helps tasks and issues of the KANBAN view as well support to control the deadline and Gantt Chart[7].

ODOO being an open source business apps[8] says the technical site Capterra.com that help companies to integrate business applications like CRM, POS, website builder, eCommerce, sales, billing, accounting, manufacturing, warehouse, HR, project, marketing tools etc., anything and everything that any business would require.

La Community in their news letter published in Dec 2017[9], publish that for new business have some sort of automation and which are acquired from different vendors, thus pay more for the automation for the outdated technology hampering the required growth. Customization of these system would bring in efficiency and easy access to information say the technical news letter.

III. Implementation Of Project Management Module Using “ODOO” ERP

There are many articles available related to “ODOO” ERP and the Projects module in “ODOO”. The Projects module in “ODOO” provides some basic functionalities related to handling projects. However further developments and customizations can be done to the basic Projects module in “ODOO”, so that it can be used for Project Management. Some snippets from research articles found on ODOO are as follows:

Amal Ganesh, in 2015 said “OpenERP is one of the prominent systems. The beauty of the framework, the open source technologies which they used in the system makes OpenERP unique and efficient. By drawing a detailed comparison between OpenERP and other prominent ERP systems, it became very clear that OpenERP meets the expectation above its competitors.”

K.N. Shanil, in 2016 said “With the introduction of ODOO/OpenERP 8.0, the ODOO has taken the ERP system to a new dimension. They have incorporated a CMS, an e-commerce system and added business intelligence to the new system.”

Thus the module used for Project Management in “ODOO” was taken as a base and further developments, customizations and configurations were done taking into account the processes of Project Management. Some of the developments done are mentioned below:

Beginning with the Project, the “ODOO” v10.0 framework was installed on the OS Ubuntu 16.04. A fresh new Database was created especially for development of Project Management module.

3.1 Installation of modules related to Project Management

In ODOO, the user can search and install the following modules related to Project Management:

1. Project
3. Issue Tracking
3. Project Forecast

The user can install all the 3 modules related to Projects one-by-one. Hence, the Project module will be installed and the user will be directed to the “ODOO” DB Home screen where he can see the Project module icon.

3.2 Creating a new Project

a. To create a new Project, the user can click on the Create button → a wizard will open on the screen which is the form view of the Project where he can see different fields.

b. On the Project form, the user can mention the name of the Project in the 'Project Name' field. Also, there exist three checkboxes as follows:

- i. Use Tasks – a checkbox field – the user can tick this to use the Tasks feature in the Project.
- ii. Allow forecast – a checkbox field – the user can tick this to use the Forecasts feature.
- iii. Use Issues – a checkbox field – the user can tick this to use the feature of tracking issues.

c. And click on Create → thus a new Project will be created and it will be seen on the Kanban view.

d. On the form view, the user can edit/add details of the Project like assigning the Project Manager, selecting the Customer for whom the project is undertaken, selecting the Privacy option (where there are 3 options available as – On Invitation only, visible by all employees, visible by following customers), selecting the Working Time of the project for the Project Team members (like Standard 40 hours per week) etc.

3.3 Creation/Allocation of Project Tasks

a. Selecting a particular on-going project, the user can create a new task related to that project.

On the Task's form, the user can enter the details like the Task Title, the Project to which the Task belongs, the Project Team member whom the task is allocated, the deadline date of the Task, the description of the Task, the name of the Customer.

b. At the bottom of the form view of Tasks, a history of the Transactions is maintained which highlights if any changes are being made to the Task created; if yes then who made the changes on what date, day and time.

3.4 Raising Issues related to the Project

a. Selecting a particular on-going project, the user can create a new issue related to that project.

b. On the issues form, the user can enter the details like the title of the issue, its description, who raised the issue, whom the issue is assigned to, what is the priority of solving the issue, the email-id of the POC, the related project of the issue.

c. At the bottom of the form view of Issues, a history of the Transactions is maintained which highlights if any changes are being made to the Issue created; if yes then who made the changes on what date, day and time.

3.5 Configuration of Requirement Stages

a. For configuration of stages related to new requirements, a new Tab for Stages has been added in the Project module under the parent tab of Configuration.

b. Once the user clicks on the Stages tab, he can view the list of Stages created such as:

- | | |
|---------------------------|------------------|
| i. Requirements Gathering | iii. Development |
| ii. Analysis | iv. Unit Testing |

c. In the form view for creating a new stage, the user can give the name of the new Stage in the Name field; also in the Projects field, he can mention the names of different projects.

Thus the stages are defined project-wise. The new stage created will be applicable to all the requirements of the projects mentioned in the Project field.

3.6 Creating a new Requirement

a. A new tab has been added under the Projects module for the Requirements Gathering process wherein the user can create a new requirement.

b. In the form for creating a new requirement, the BA/Consultant can give the Requirement title in the Summary field. He can mention the Developer's name whom the requirement is assigned to and who is the Point of Contact for the requirement.

He can define the Priority of the requirement whether its low, medium or high from the client's point of view.

He can also add the Project and the module to which this requirement belongs to.

Thus the necessary fields to define a new requirement have been added in the Requirements form.

When a new requirement gets created, it automatically gets a sequence number in the format as RQ005.

3.7 Managing Change Requests

A new feature of 'Change Requests' is also developed in the Project module. If there is a change in any requirement communicated by the Customer, then it can be tracked and recorded using this newly developed feature in "ODOO".

In the Change Requests form, the user can fill in the details of the Change Request like giving its title in the Summary section, who raised the change request, whether it was approved or rejected, who approved/rejected it, who is the point of contact, the date when the change request was raised etc.

3.8 Customizing Issues section

In the newly developed Project module, in the Issues section, some additional customizations have been done as follows:

(a) Every issue is given a unique sequence number (b) Configuration of stages for issues

a. Whenever a new issue is created, it automatically gets a new sequence number in the format IS001. This helps to uniquely identify every issue and also for easy reference of issues.

b. Configuration of Stages for issues which helps to indicate the current status of every issue → whether the issue is still open or closed successfully.

There are 3 stages configured for every issue:

(a) New (b) In Progress (c) Solved

3.9 Managing Test cases

a) For testing a developed functionality during the execution of a Project, a new tab has been developed in the Project module called Test Cases.

b) Here the user can create a new Test Case for every round of Testing being conducted for the developed functionality.

c) In the form view for Test cases, the user can fill in the details of the Test case like giving the Title of the Test case, mentioning the related module, whom the Test case is assigned to for solving, who derived the Test Case, on what date the Test cases were derived and the related Project.

d) Thus 1 record can be created for 1 round of Testing and the multiple Test cases can be added in the 'Test Cases' table below. Also the user can mention the current status of every Test case whether it is New, In Progress or Completed.

3.10 Project Forecast

A new feature called Project Forecast has been added in the Project module. The Project Team can plan the time required for completion of every Task in the Project and hence can forecast the total time required to complete the entire project. Also, the time required for completion of every task is compared with the Timesheet of every Team member. Hence, the functionality calculates and displays the % of Time (in hours) utilized for completion of the Task.

The user can select the Employee (the Project Team member), Project and related Task for which the forecast needs to be made. He can select the Start and End Dates of that Task. Once the dates are selected, the Effective hours get automatically displayed based on the Working Time schedule of that Team member.

Now the user can plan the time that may be required to complete the task and add that time (in hours) in the 'Planned Hours' field. Due to this the % of Time that is planned to be utilized in the specified duration of that task gets automatically displayed.

For the Task: Setting up Approval Hierarchy for Sales users, as per the plan, its Start and End Dates are 16th Oct 2017 and 20th Oct 2017 respectively → hence the task is planned to be completed within 5 working days.

The Working Time Schedule of the Team member Mr. Ankush Kudtarkar is 40 Hours per Week with 8 working hours per day.

Hence, the effective Hours is automatically calculated as 40 Hours (since the Project Team member works for 5 working days from 16th to 20th Oct with 8 hours per day).

Now, for the specified task, if the Planned Hours for the given duration is entered as 32 Hours, then the % Time that will be utilized in the given duration for this task also gets calculated automatically → i.e. 80% of the Time will be utilized for the completion of this Task.

3.11 Project Timeline Representation using Gantt Chart

A Gantt Chart is used to illustrate the Project schedule. It shows the Start and End dates of different tasks in the Project. In “ODOO”, the Gantt Chart can be used to show the Planned Timeline of different Project Tasks as per the data entered in the Project Forecast feature. Also, it can be used to show the actual Timeline of the Project Tasks i.e. showing the actual status or the time taken for completion of the tasks.

IV. Survey, Data And Methodology

A survey was done amongst the users of “ODOO” ERP to figure out efficiency of “ODOO” ERP and Project Management module in following parameters:

- a. Usability
- b. Performance
- c. Scalability
- d. Robustness
- e. Efficiency
- f. Ease of use

An exploratory study was conducted which adopted two types of methodology. In this study, first type of study was mainly carried on Secondary Data Survey, consisting of the data collected from previous research studies and reports and the second type of study was on the Primary Field Survey- data collected from users of “ODOO” ERP.

Effort was made by the researcher, as far as feasible, to take all related aspects in understanding “ODOO” ERP and development of Project Management module using “ODOO” ERP.

The secondary data was collected from various published and unpublished sources like electronic resources, documents, reports, magazines, journals, websites etc.

This research work, on the basis of primary field survey is classified as survey research or field investigation because the researcher picked up the data from the dynamic real-world field conditions, so ensure the findings to be realistic. The advantage of this kind of research was that the respondents gave the real live information which they experience in the daily activities which has helped to find to the actual situation that how the Projects module in “ODOO” can be efficiently used for Project Management with appropriate developments, customizations and configurations as per the user requirements.

V. Analysis

The “ODOO” ERP survey was conducted amongst the “ODOO” users across different organizations. The main motive of this survey was to find out the efficiency of “ODOO” ERP and Project Management module in terms of its usability, performance, portability, scalability, robustness, efficiency and ease of use. The sample size was 25. In the sample, there were 75% of male users and rest were females. Almost 60% of the users belonged to the age group of 25 to 30 years.

5.1 Usability

Usability refers to the extent to which “ODOO” ERP and its modules like Sales, CRM, Purchase, Project Management etc. can be used by its users for different business functions. It is measured in terms of attributes like effectiveness, efficiency and customer satisfaction. Also, it focuses on whether the basic and customized functionalities developed in different modules are easily understood and extensively used by the users.

From the survey it was observed that almost 54% of the users use the Project Management module in “ODOO”. Also, the results show that about 79% of users/developers feel that the basic Project module provided by “ODOO” is not sufficient for Project Management, there is a need for extra developments or customizations in the basic Project module in “ODOO”. About 56% of the users are developers who have developed functionalities in the Project Management module in “ODOO”.

Thus the survey results depict that the Project Management module in “ODOO” is extensively used and developed by “ODOO” users.

5.2 Performance

The Performance attribute specifies whether the basic and developed functionalities of Project Management and other related modules in “ODOO” ERP work properly as per the user requirements; also whether the data and field validations work correctly in case of incomplete or inconsistent data.

From the survey it was observed that 65% of the users agree that if proper developments, customizations and configurations are done as per the project management and SDLC stages, then it can be used as a fully efficient and cost-effective tool for Project Management.

Also, 67% of the users strongly agree that the Troubleshooting (Issue-solving) section in the Projects module helps to continuously track, prioritize and solve the issues; also shows a clear status of issues whether solved or not and no. of issues pending to be resolved; hence helps in increasing overall project efficiency.

56% of the users agree that the Reports generated using Project Management module in “ODOO” give a clear picture of the status of the progress of Projects under implementation.

Thus the survey results depict that if the Project Management module in “ODOO” is developed properly then it will work well in different stages of Project Management yielding better results.

5.3 Portability

Portability refers to the ability of “ODOO” ERP Software Suite to work on different Operating Systems (OS). As per the survey results, 62% users have used or installed “ODOO” on Linux (Ubuntu) OS, while 20% of the users use “ODOO” on Red Hat Linux and remaining opted for Windows OS. This implies that most of the users prefer installing “ODOO” on a Server with Linux (Ubuntu) OS. Also, “ODOO” uses Python and XML (programming languages) scripting for functionality development and GUI respectively; and Postgres database (with PostgreSQL DB Query Language). Thus, “ODOO” provides an open-source software framework which is freely available, portable, redistributable and the code can be easily modified.

5.4 Scalability

Scalability refers to the ability of “ODOO” ERP software suite to handle increasing number of users; also it refers to its capacity to store, process, and retrieve large amount of data. From the survey results, it is observed that about 77% of the users feel that “ODOO” ERP is efficient in terms of increasing the number of users. About 67% of the users agree that the reports generated using Project Management module in “ODOO” give a clear picture of the status of the progress of Projects under implementation. Also 54% of the users believe that the Project Management module is capable to be integrated with other modules like Accounting, HR Timesheets etc.

5.5 Ease of use

This attribute specifies how “ODOO” ERP is easy to use and user-friendly in terms of its Graphical User Interface (GUI), its developed functionalities, user navigations etc.

The survey results show that 79% users feel “ODOO” ERP is simple, easy-to-use in terms of GUI, user navigations. Based on its ease of use and convenience, about 67% users agreed that they will prefer “ODOO” ERP implementation for their own business. Also, based on experience with “ODOO”, 72% users will recommend their acquaintances, or business partners, or other companies in their network to use “ODOO”.

VI. Conclusion

“ODOO” offers multiple business benefits and hence helps the organizations to grow their businesses in an unprecedented manner. If a company’s current ERP system lacks in the desired functionalities required to support its business operations, then it’s time for the company to switch over to effective ERP systems like “ODOO”.ODOO provides a wealth of functionalities and features with numerous modules as per the business requirements which can be easily deployed to meet the business needs. “ODOO” provides an active support from its online community of developers and users and hence the stack of features and functionalities offered by “ODOO” will always continue to increase as released by it in its newer versions. Since “ODOO” is highly modular, one can find the business modules which are needed to support the operations of a business and can benefit from its integrated solutions.

“ODOO” is based on an advanced and up-to-the-minute technology processes stack. These technologies are being upgraded regularly from time to time and are capable of adapting to the latest business market paradigms.

Using “ODOO” to develop a Project Management tool, it offers flexibility to develop functionalities based on all stages of the SDLC and also assists appropriate configuration of all phases of Project Management. The tool can generate regular Project status reports giving a gist of the progress of the Project; it can assist in tracking the issues and solving them based on priorities set; it can also help to forecast the pain

points or risks and their impact on the Project progress, hence helping to develop strategies for prevention of forthcoming problems and risk mitigation. Having done proper customizations and thoroughly tested, it will help to keep track of everything, from big picture to the minute details of Project Management.

“ODOO” is open source is nature. It is free to download and easy to install. There is no licensing fee associated with “ODOO”. There is a vast community allied to this ERP and management tool which assures continued support. There is no specific group of people, technicians or developers that control the customizations and developments done to the “ODOO” ERP system, the businesses can enjoy no lock-ins by a particular vendor. The source code is freely re-distributable and customizable. This implies the businesses that use “ODOO” can also apply their own patches for developing, customizing, enhancing its functionality and fixing the issues or bugs in it.

“ODOO” delivers an imperative benefit of cost savings. Though, there is some initial cost incurred on the effective implementation of “ODOO” which is compensated by better technology and higher functionality, but there is also a wide range of tangible & intangible benefits continuously delivered by “ODOO” which makes it a highly cost-effective solution. “ODOO” decreases the administrative costs, operating costs, inventory costs, maintenance costs and obsolete inventory when implemented in the business significantly. These intangible benefits help in significant cost savings for the business.

Not only “ODOO” is an easy-to-use software, but also it is highly flexible as it can be easily developed and customized to meet the specific business requirements of an organization. It supports the continuous innovation and scalability which is required by the organizations in order to lead the market in today’s cutting edge competitive scenario.

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