Comparative Analysis of ERP Systems:
Microsoft Dynamics NAV vs. OpenERP

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Abstract—This paper concerns the comparative implementation of Microsoft Dynamics NAV and OpenERP at ICIMOD and Possible Health respectively. Organization can get optimum level of benefit in terms of ERP performance and result as per the implementation of its requirement. The goal of this paper is to help organizations select ERP system cost effectively to attain better efficiency in various organizational processes.

Keywords—Microsoft Dynamics NAV, OpenERP

I. INTRODUCTION

Addressing the information needs of all the functional departments across the organization without a single unified system is inefficient. Enterprise Resource Planning (ERP) systems are both commercial and non-commercial software that optimize, automate and integrate most of the business processes and transactions in an organization. ERP systems promise integration of organizational processes and access to integrated data across the entire enterprise. Moving to being a paperless organization, ICIMOD and Possible Health adopted extensive integration of all the subunits of the organization since 2009 and 2015 respectively. Before ERP, different programs and subunits carried out their day to day activities either in a tedious paper based manner or by some separate application for different modules.

II. ERP ARCHITECTURE

A. Microsoft Dynamics NAV

- RoleTailored Architecture (3 tier architecture)
  - Presentation level (RoleTailored client)
  - Business logic and communication level (Microsoft Dynamics NAV Server)
  - Data level (SQL Server database)

Fig 1: RoleTailored Architecture (K. Dhindsda et. al, 2013)

- Web Client Network Architecture (4 tier architecture)
  - Presentation level (Web Browser)
  - Web server (Microsoft Dynamics NAV web server components)
  - Business logic and communication level (Microsoft Dynamics NAV Server)
  - Data level (SQL Server database)

Fig 2: Web Client Network Architecture (K. Dhindsda et. al, 2013)
B. OpenERP

An Open ERP system is formed from 3 main components:

- **Database Layer (PostgreSQL)**
  Open ERP uses PostgreSQL as the default database for all its functionality. The PostgreSQL database server contains all of the databases that contain all data and most elements of the Open ERP system configuration.

- **Open ERP application server (Middle Layer)**
  The Open ERP application server contains all of the enterprise logic and ensures that Open ERP runs optimally. The Server itself is written in Python language. Open ERP application server is released under Aeffro GPL License.

- **Client Layer**
  The web server, a separate application called the Open Object client-web, which enables connecting to Open ERP from standard web browsers and is not needed when system is connect using a GTK client. The client-web component can be thought of as a server or a client depending on the user’s viewpoint. It acts as a web server to an end user connecting from a web browser, but it also acts as a client to the Open ERP application server just as a GTK application client does.

### III. REAL TIME IMPLICATION OF ERP

Major Modules of ERP Software used at ICIMOD and Possible Health:

#### A. Major Modules of ERP Software – ICIMOD

- **Human Resources Module**
  Human resource management module capability will keep employee data in a secure manner, track timesheet, leave balance, process contract and also provide quick access to the employee’s complete employment information.

- **Finance and Accounting Module**
  A quality Enterprise Resource Planning software solution will include strong financial management module that is fully integrated with the organization’s core functional areas of manufacturing and sales order management. In robust Enterprise Resource Planning systems, the transactional data generated from these departments will be available for immediate review. These capabilities offer full financial visibility into the organization’s payables and receivables with up-to-date access to inventory level. This transparency will provide accounting personnel and the executive staff with real-time financial data that helps facilitate quick, yet highly informed organizational decisions.

- **Event Management Module**
  Event management module keeps the tracking of in-house/out-house as well as in-country/out-country event details as well as facilitates staffs to claim the event expense form.

- **Travel Application Module**
  Travel application module enables staffs to post their travel application as well as claim travel expense if needed through a managed integrated system.

- **Procurement and Logistic Module**
  Procurement and Logistic Module smoothens the processing of order. The module is highly applicable in tracking vendor information, process purchase request and goods receipt note.

- **Project Management Module**
  This module basically deals with donor’s profile, funding and other activities related to corresponding cost centers.

#### B. Major Module of ERP Software – Possible Health
• Stock Management Module

Central stocks are managed by the Openerp. When clinician prescribe medicine from Electronic health record system that request is parsed to the atom feed management and gets synced with the current stock available at the warehouse.

IV. COMPARATIVE ANALYSIS OF MICROSOFT DYNAMICS NAV AND OPENERP

A. NAV at ICIMOD

Broader Modules are available in NAV as per the organizational requirement. NAV is proprietary software of Microsoft which implies that Microsoft is liable for all the maintenances and the vendors are available for support, as per the current scenario in Nepal. ICIMOD users are more aware of Microsoft products and its technologies. NAV being windows OS dependent, implementation of it takes into account the dependencies with OS as well as other implications like users integration with active directory, etc. This also makes Microsoft Outlook integration, Jet Reports addition, SharePoint implementation possible with ERP system in the organization. Professional software support provides stronger documentation which is one of the major requirement at ICIMOD.

B. OpenERP at Possible Health

Single ERP modules along with supporting apps for different functions are used at Possible Health. Extension of the existing standard module is not of much importance of the organization. OpenERP is a community owned software and there’s no partners working currently for OpenERP in Nepal which increases the dependencies for support. The implementation of ERP at Possible is so that not much of configuration as well as module enhancement is required to perform on daily basis. The organization uses Open Source technologies and the System Integrators/CTOs as well as the users are well aware of open source technologies like CentOS, etc., thus making OpenERP optimum in the current scenario

V. RESULTS AND DISCUSSION

OpenERP being platform independent software and Possible Health opting for open source software for the operations in the organization, this ERP solution has been able to perform to the optimum level since its implementations. It has so far been able to maintain the transparency and ease-of-use amongst around 50 ERP users. ICIMOD on the other hand where the users are well acquainted to windows operating system since the beginning, uses Microsoft Dynamics NAV for enterprise resource planning purposes. The ease-of-configuration is higher with the frequent configuration requirement of the organization. Local Partner support and strong documentation makes NAV the best choice for ICIMOD where the number of user exceeds over 300 on a daily basis.

VI. CONCLUSION

Medium-sized companies like ICIMOD and Possible Health typically gain the optimum advantages with the implementation of ERP software as per the organizational needs. Whether we use open source development tools or proprietary tools, it requires custom development at some level. In order to implement ERP cost effectively and attain better efficiency in organizational processes, organization should study the must have capabilities and that would be nice to have features. Depending upon the cost implications, in-house efforts (availability of resources: both human and technological) and the ability to customize the product for streamlining the processes, an organization can opt for OpenERP or proprietary software.
REFERENCES


