

EVALUATION OF TRAINING MODULES IN OPEN SOURCE ERP

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ABSTRACT

Enterprise resource planning (ERP) system is an information system that integrate most of the organizations' business processes which was and is still being used heavily. The adoption of open-source software ERP (OSS ERP) is increasing recently by small and medium enterprises (SMEs). There are many vendors of open-source ERP where some offer community editions for free and enterprise edition as proprietary software. Human resources (HR) is one of the main functional areas of ERP where the software is used to automate many processes including recruitment, hiring, training, payroll and benefits. One of the main business activities of HR is training by which the HR team can manage their daily employee's training processes. The employee training raises the organization productivity by affecting positively the successful accomplishments of organization's goals and objectives. The aim of this paper is to provide a comparison between existing human resource modules on community edition of several OSS ERP vendors (Odoo, ERPNext, aXelor, Dolibarr, Bitrix24, MixERP, EasyERP) and then compare more specifically the functionalities and features of training management systems in ERPNext and aXelor ERP. Furthermore, available training management system apps in Odoo store (apps) will be examined. Our evaluation reveals that many of the basic training functionalities (for example employee training reports) are missing from the free editions of OSS ERP and requires specific purchases or programming to be added as plug-ins.

KEYWORDS

ERP, open-source ERP, human resources, training management system

1. INTRODUCTION

Enterprise resource planning (ERP) is one of the information systems that most companies are utilizing nowadays to process their business operations and daily activities. The major functional areas for business operation that most companies have are human resources (HR), supply chain management, sales, marketing, finance and accounting [1]. The human resources functional area contains several business functions namely recruitment, training, payroll, benefits and government compliance.

The role of HR department is to manage the process of all of these main business functions and ensure accomplishing the related tasks which are required for a system that can control the information flow through all the HR department tasks. The training business function for HR deals with the employee training process to enhance employee performance and productivity which lead to the success of the organization. Many job positions require continuous development and updated professional certifications which needs continuous education. There is a need for a system that can help the organization to manage the employee training process automatically to reduce the time of performing the tasks and reduce human error.

The adoption of open-source software (OSS) in the field of enterprise resource planning has been increased nowadays due to several reasons like cost reduction and continuous enhancement, maintenance and support [2]. There are different vendors that provide a web-based open-source ERP including: TinyERP, ERPNext, Odoo, Dolibarr, OpenBravo and Tryton [3]. The community editions of those vendors have different modules and systems. This paper provides a comparison between the HR modules available on community edition of OSS ERP including Odoo, ERPNext, aXelor, Dolibarr, Bitrix24, MixERP, and EasyERP. Then, the paper will provide a comparison between the functionalities of training management system module available on ERPNext and aXelor. The third comparison will be between the existing training management systems apps on Odoo store based on provided functionalities.

2. LITERATURE REVIEW

2.1. ERP

There are many definitions that can be used to define enterprise resource planning (ERP). It has been defined by Ellen Monk and Bret Wagner as an information system used by companies to integrate all business areas including finance, accounting, human resources, sales, marketing, manufacturing and logistics to manage the company’s business process using joint database and mutual management reporting tools [1]. Business process is a set of activities that use different input types and produce a valued output to the customer of certain process [1].

Daniel e. o’leary has defined ERP as “a powerful software packages that enable businesses to integrate a variety of disparate function in which it can provide the foundation for wide range of E-commerce-based processes, including web-based ordering and order tracing, inventory management, and built-to-order goods” [16].

There are many functional areas of operations that most of the organizations have which are sales and marketing, finance and accounting, supply chain management and human resources. Each one of these main functional areas have sub business functions which perform specific operations and activities [1] as presented in (Table 1).

Table 1: Functional Area of Operations with Related Business Functions [1]

Functional area of operation	Marketing and Sales	Supply Chain Management	Accounting and Finance	Human Resources
Business Functions	Marketing a product	Purchasing goods and raw materials	Financial accounting of payments from customers and to suppliers	Recruiting and hiring
	Taking sales orders	Receiving goods and raw materials	Cost allocation and control	Training
	Customer support	Transportation and logistics	Planning and budgeting	Payroll
	Customer relationship management	Scheduling production runs	Cash-flow management	Benefits
	Sales forecasting	Manufacturing goods		Government compliance
	Advertising	Plant maintenance		

There are many benefits of ERP for large, small and medium organizations. The main benefits of ERP as mentioned by (Beheshti , 2006) in his research are saving million of dollars for companies during a log run of the system, reducing a huge amount of paperwork, integrating many systems in a unified system and improving business processes [17]. A research by Justin (Goldston, 2020) classified the ERP benefits into three main categories which are technological benefits, knowledge sharing benefits and leadership benefits [19]. More benefits have been mentioned by Stair and Reynolds on their book “principles of information systems” including ERP support of the operational decision making by improving data access to all information related to business transactions, enabling organizations to reduce the cost of utilizing many separated systems by replacing them with a single system that integrates all business functions and provide enhancement of organization’s work processes [18].

2.2. Open source ERP

The open source initiative was founded back in 1999. Open source initiative (OSI) is a nonprofit organization that has been formed globally to distribute the knowledge and education about the open source benefits and build relationships between different communities of open source [21]. According to OSI’s definition of open source, open source is the access to source code with the following characteristics, free distribution, no discrimination against persons or groups, no discrimination against fields of endeavor, license must not be specific to a product, license must not restrict other software and license must be technology neutral [2].

Open source software (OSS) is a free to use software systems in which its source code is fully accessible by everyone who needs to use it and being able to modify and redistribute the copies of the same software [20]. There are two types of open source software which are community OSS that is developed and owned by the software community and commercial OSS which is developed and owned with revenue intent [3].

Open source ERP is an enterprise resource planning system software that its source code is available for free for any developer and can be modified based on polices provided by the OSS vendor so the company can customize the ERP features based on their business needs [22].

There are many criteria that the company can take on their consideration while choosing an open source ERP for their organizations. Johansson and Sudzina (2009) identified a list of criteria that the organizations can consider while choosing the appropriate OSS ERP that suite their needs including, the speed and ease level of implementation, product price, vendor support, reliability, ease of use, customization capability, integration capability, fit to organization, flexibility, training provided, use of latest technologies, upgrades and scalability [24].

SMEs are the most suitable candidates for utilizing open source ERP due to their low budget, flexibility and agility [23]. According to Small and Medium Enterprises General Authority (Monsha'at) in Saudi Arabia, the difference between small and medium enterprises is presented in (Table 2).

Table 2: SMEs Definition by Small Medium Enterprises General Authority

	Number of Employees	Annual Revenue
Micro	1 to 5 full time job employees	Zero to 3 million
Small	6 to 49 full time job employees	3 to 40 million
Medium	50 to 249 full time job employees	40 to 200 million

(Table 3) presents a comparison between all web based open source ERP according to the programming languages used and database management system (taken from Mladenova, 2020).

Table 3: Comparison of Web Based Open Source ERP [3]

OSS ERP	Programming language	Database Management System
Odoo	Python, JavaScript	PostgreSQL
ERPNext	Python, JavaScript	MariaDB
Apache OFBiz	JAVA	Derby, PostgreSQL, MySQL
Dolibarr	PHP	PostgreSQL, MariaDB, MySQL
Tryton	Python	PostgreSQL
Axelor ERP	JAVA, Scala, Kotlin, Groovy, JavaScript	PostgreSQL, MySQL
WebERP	PHP	MySQL
Openbravo	JAVA	PostgreSQL
Bitrix24	PHP	MySQL
MixERP	C#, .NET	PostgreSQL

2.3. Human Resource Information System

HRIS stands for human resource information system which is a system that contains several modules in ERP used to manage HR business functions activities and processes. The department of human resources is responsible for several activities that organization performs like recruitment, hiring, reward, training and termination of employees [1]. The responsibilities of HR departments' employees include recruiting and hiring new employees, building the organization structure, defining job positions, providing a proper education and training for employees, managing performance of employees, determining merit increase and bonuses, managing personnel actions, and handling employee benefits [1].

On daily bases, most of HR processes can be done using human resource information system which can support the organization in tasks automation, resources reduction, HR cost reduction, and minimize the use of papers [25]. Chakraborty (2013) mentioned that the companies can benefit from HRIS in increasing the efficiency and effectiveness of HR business process and providing self-services HR [25].

Wibawa et al. (2018) mentioned on their research about the objectives of using HRIS in SMEs that includes offering the enterprises with a comprehensive information system of people and job positions, provide information in timely manner with appropriate cost, increase security of data and raise personal privacy [26].

2.4. Training Management System

Okechukwu (2017) stated on their research that the training and development for employees can be seen as a way of gaining new knowledge, skills, abilities for accomplishing duties and tasks at working environment [4]. Nda et al. (2013) mentioned on their research that employee training results in increasing the organization productivity by affecting the successful accomplishments of organization's goals and objectives [5]. They mentioned also that the main goal for many organizations is to increase revenue, gain a high profit and use of a vital tool to recognize the workforce efficiency and effectiveness. Figure 1 shows the relationship cycle between the employee training and revenue [5].

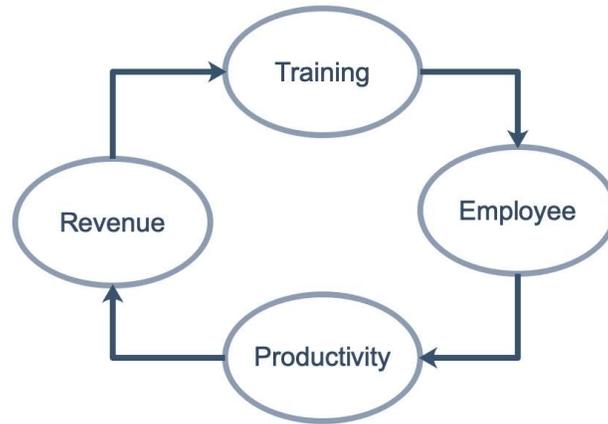


Figure 1: Relationship cycle between employee training and revenue

Training management system (TMS) is a software that can be used to automate the existing training operations that is done by HR team in daily basis which is designed to organize the delivery of training processes [27]. The TMS can support the HR team in scheduling the training courses, register training centers, track the payments and help in reducing the time spent in administration work [27]. The TMS contains several features and functionalities include training course creation, scheduling, training categorization, training centers and trainers' registration, trainee registration, payments tracking and report generation [28].

3. RESEARCH METHODOLOGY

The methodology used in this paper is a comparative methodology for the following segments:

- a. A general comparison of HR modules in OSS ERP

We will compare seven OSS ERP vendors that provide HR modules on community edition. The seven OSS ERP are Odoo, ERPNext, Dolibarr, aXelor ERP, Bitrix24, MixERP and EasyERP. The HR functions used to compare between them are training, employees, expenses, leaves, appraisal, loan, fleet, attendance and recruitment.

- b. Training management system comparison of two OSS ERP

We will compare the functionalities available in two community editions of training management systems available in ERPNext and aXelor ERP. The system functionalities are: training program management training courses management, training providers, training scheduling, register training results, register training feedback, training categories identification, training skills identification, employee registration on training, generate application reports and generate employee training reports.

- c. Training management apps on Odoo Store

We will compare between three different training management systems apps available on Odoo store based on : supported version of the app, if it's paid or free, the price and the functionalities. The functionalities used in the comparison are: training program management, training courses management, training providers, training scheduling, register training results, register training feedback, training categories identification, training skills identification, employee registration on training, generate application reports and generate employee training reports.

4. RESULTS AND DISCUSSION

Open source ERP vendors provide many human resource modules to manage the HR business processes and activities in both community edition for free and enterprise edition for charge. The HR modules that are available in community edition for different open source ERP solutions are presented in (Table 4).

Table 4: Open Source ERP (HR) community edition

Open source ERP	Training	Employee	Expense	Leave	Appraisal	Loan	Fleet	Attendance	Recruitment
Odoo [6]	-	yes	yes	yes	-	-	yes	-	yes
ERPNext [7]	yes	yes	yes	yes	yes	yes	yes	yes	yes
Dolibarr [8]	-	yes	yes	yes	-	-	-	-	yes
aXelor ERP [9]	yes	yes	yes	yes	yes	-	yes	-	yes
Bitrix24 [10]	-	yes	-	-	-	-	-	-	-
MixERP [11]	-	yes	-	yes	-	-	-	yes	-
EasyERP [12]	-	yes	yes	-	-	-	-	yes	yes

The OSS ERP vendors that provide training management system in their community editions are ERPNext and aXelor. The comparison between training management system module features that available in ERPNext and aXelor is presented in (Table 5).

Table 5: TMS features comparison between ERPNext, aXelor and proposed system

#	Training Module Features	ERPNext [7]	aXelor [9]
1.	Web based application	yes	yes
2.	Training program	yes	yes
3.	Training course	yes	-
4.	Training providers (training centers)	yes	-
5.	Training session (schedule)	yes	yes
6.	Training result	yes	-
7.	Training feedback	yes	-
8.	Training categories	-	yes
9.	Training skills	-	yes
10.	Training registration	yes	yes
11.	Application report	yes	-
12.	Employees training reports	-	-

Odoo doesn't have a training management system module in the community edition or the enterprise edition. There are several apps available in Odoo store that some developers and companies developed and offer them for free or for charge with different prices as substitutes for the training module. We have found three apps for employee training management system in Odoo store with different functionalities. One of them is free and two of them are paid

application. The names of these apps and information related to their technical name, available versions and fees are available in Table 6.

Table 6: TMS apps available in Odoo

Training Module Features	Employee's Training Management [13]	Employee Training Management Application [14]	HR Training by Openinside [15]
Technical Name	Elsaka_HR_Training	Odoo_training_management_app	Oi_hr_training
Available versions	V 11, V 12	V 12, V 13, V 14	V 11, V 12, V 13, V 14
Free/Paid	Free	Paid	Paid
Price	0	\$115.14	\$646.59

The features and functionalities in these three apps vary. All of the three apps are web-based applications as the main Odoo feature. The comparison between these available apps and the proposed system are presented in (table 7).

Table 7: Comparison between available apps and proposed system

#	Training Module Features	Employee's Training Management [13]	Employee Training Management Application [14]	HR Training by Openinside [15]
1.	Web based application	yes	yes	yes
2.	Training program	-	-	-
3..	Training course	yes	yes	yes
4.	Training provider (training centers)	-	yes	-
5.	Training session (schedule)	yes	-	-
6.	Training result	-	-	-
7.	Training feedback	-	-	-
8.	Training categories	-	-	yes
9.	Training skills	-	-	-
10.	Training registration	yes	yes	yes
11.	Application report	-	yes	-
12.	Employee training report	-	yes	-

The app called “Employee’s training management” which its technical name is “Elsaka_HR_Training” is free but only available for version 11 and 12 of Odoo, it has limited functionalities like training course creation, training course scheduling and employee registrations. It doesn’t provide features for creation of training programs, training providers, register results, feedback, categories, skills and generation of training reports [13]. The app called “Employee Training Management Application” which its technical name is “Odoo_training_management_app” is available for charge which costs \$115.14 and available for version 12, 13, and 14; it has limited functionalities like training course creation, training providers, training course scheduling, employee registrations, and report generations. It doesn’t provide features for creation of training programs, register results, feedback,

categories and skills [14]. The app called “HR Training by Openinside” which its technical name is “Oi_hr_training” is available for charge which costs \$646.59 and available for version 11, 12, 13, and 14; it has limited functionalities like training course creation, training categories, and employee registrations. It doesn’t provide features for creation of training programs, training providers, training scheduling, register results, feedback, skills and report generation [15].

5. CONCLUSION

The open source software is gaining popularity nowadays. There is an increasing interest from small-medium companies (SMEs) in using open source software to build their information systems including enterprise resource planning (ERP).

This paper shows that there is a lack of a training management systems module on open source ERP. There is an actual need to develop a training management system that contains the features and functionalities to support the training and development of business activities in human resources especially for Odoo software.

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