

## CUSTOMIZATION OF OPEN SOURCE ENTERPRISE RESOURCE PLANNING SYSTEM

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### ABSTRACT

*This paper proposes the implementation of Open Source Enterprise Resource Planning (ERP) System called ADempiere based on a predetermined case study of Table Facility of Furniture Company called Global Furniture. The implementation process is focused on two points; those are customization and systemization. Customization is the process of adjusting the ERP system in order to fit it to the business process of the company, while the systemization aims to process the customer order by using the ERP System that has been customized previously. The result of this study is the success of the customization and systemization process based on the business processes in Global Furniture Company.*

**Key words:** *Open Source ERP System, Customization and Systemization, Adempiere*

### 1. INTRODUCTION

The rapid changes and intense competition in industrial world become the reasons for the company to continue work smartly in order to survive and winning the rivalry. This usually could be conducted by continuing to improve the company performance towards a better direction. Along with the development of the technology, many companies now are using the technology to improve the performance, such as by implementing Enterprise Resource Planning (ERP) system.

ERP system is a highly integrated enterprise information system that manages all aspects of the business operations of an enterprise (Wang, 2005). It includes production planning, purchasing, engineering design, manufacturing, marketing, distribution, accounting and customer service.

There are so many advantages could be obtained by the company from implementing ERP system, such as having the integrated information of the financial and customer-order. Besides, the company will also able to standardize and accelerate the manufacturing processes, reduce the level of inventory and order lead time, standardize the information of human-resource, and so on (Ayag, 2007).

There are two kinds of ERP system implementation in the company. First, ERP system implementation could be performed by changing the business processes of the company so that the business process will fit the available ERP. The company that implements this system must have the courage to take the risks in changing the existing business processes which are not easy to be conducted. Common difficulties are usually caused by employee's culture that already comfortable with the old system and unfamiliar with the new one. Second, ERP system implementation could be conducted by the way of customization to the available ERP system which refers to the existing business process of the company. This method is more difficult and takes a long time. However, the ERP system will be easier to be implemented, because the company does not need to change the cultures and only require conducting the additional training to accommodate employees with the ERP system.

In addition, a successful ERP system could not only meet the requirements of current business functions, but also needs to satisfy the future requirements (Wei, 2008). Continuous upgrades and maintenance are very important for an ERP system. An upgrade to the ERP system could occur

because the company should adapt to the changes of the surrounding. This will inevitably affect the existing business processes of the company and will further impact on the ERP system as well. Therefore, there are some factors to be considered when a company decides to implement the ERP system, including the ease of customization of the ERP system (Zhang, 2003). Ease of customization will help the company to upgrade and maintain the ERP system that has been implemented. The company that implements commercial ERP System requires huge cost for upgrading and maintaining the system because of the need of experts. Meanwhile, by implementing open source ERP system, the company does not need huge amount of investment in upgrading and maintaining the system because the company could provide their own expert by learning in depth about system customization.

There are so many researches related to the ERP system implementation in the company. Reference (Dowlatshahi, 2005) conducted the research to analyze the strategic success factor in ERP design and implementation by using two kinds of case studies. Reference (Berchet, 2005) also conducted the research related to the implementation and deployment of an ERP system based on the industrial case study of Alcatel in Annecy, France and those kinds of implementation and deployment are considered very success and there are major advance for the company in the area of information management. Reference (Mishra, 2010) implemented the ERP system based on the case study for the Fast Moving Consumer Goods (FMCG) house in South-Asia which outcome of the implementation was the integrated of the whole part of the supply chain on a one-single platform avoiding duplication of data and the improvement of the resource productivity. Reference (Tambovcevs, 2010) also implemented the ERP system based on the case study of construction enterprise and has successfully implemented ERP system which could link all areas of an enterprise including customer relation, manufacturing, human resource, financial management and distribution with customers and suppliers, and forming a highly integrated system with

shared data. Potential benefits include the decreasing in inventory level, the reduction of the working capital, the abundant information about what customer wants and needs, along with the ability to view and manage the extended enterprise of customers, suppliers, and alliances to be integrated. Reference (Gore, 2011) conducted the research to explore the preference for customized ERP in the Nordic log house manufacturing context. Reference (Shah, 2011) conducted the research based on the case study to identify the obstacles that appear when implementing the ERP system in the public organization, while reference (Johansson, 2011) conducted the research related to the synchronization between the ERP system and business process during the new ERP system development.

Furthermore, since ERP systems often require a great deal of customization, having an open-source ERP seems like a good fit (Lemos, 2008). Open source ERP system also appeared to become an opportunities to be implemented for the company, if the company could not support the cost of large ERP systems (Costa, 2006). Until now, there have been some researches in the form of review, analysis, and implementation of open source ERP system, as has been conducted by reference (Lee, 2009) who has conducted the research about open source ERP system and how to do the development using the Service-Oriented Architecture (SOA). Reference (Huynh, 2010) conducted research on the use of xTuple open source ERP system for teaching the business process integration in supply chain management and reference (Johansson, 2010) also conducted the research which focuses on the differences between proprietary ERP development and open source ERP development and the possibility of open source ERP system to be implemented in Small Medium Enterprises (SMEs).

This research proposes the implementation of an open source ERP system called ADempiere for the company based on a case study of one facility in a furniture company called Table Facility of Global Furniture Company. The implementation is

more about how to customize and systemize the ERP system in order to fit with the existing business processes of the company.

## 2. CUSTOMIZATION

The customization process is a process of adjusting the ERP System in order to fit it with the business processes of a company. The customization process of Table Facility of Global Furniture Company consists of some steps; those are:

- a. Managing the Chart of Account, that would be used to run the accounting engine of ADempiere. The Chart of Account that is used by Global Furniture

Company is the Indonesian Chart of Account that contains lists of useful account related to the business processes of the Global Furniture Company that has been adjusted to Rupiah currency.

- b. Registering Global Furniture Company as the new client of ADempiere.
- c. Registering company structure of Global Furniture Company into ADempiere which consists of a client company, organization, warehouse, and internal location inside the warehouse. This figure below shows the company structure of Global Furniture and the general organization structure of ADempiere.

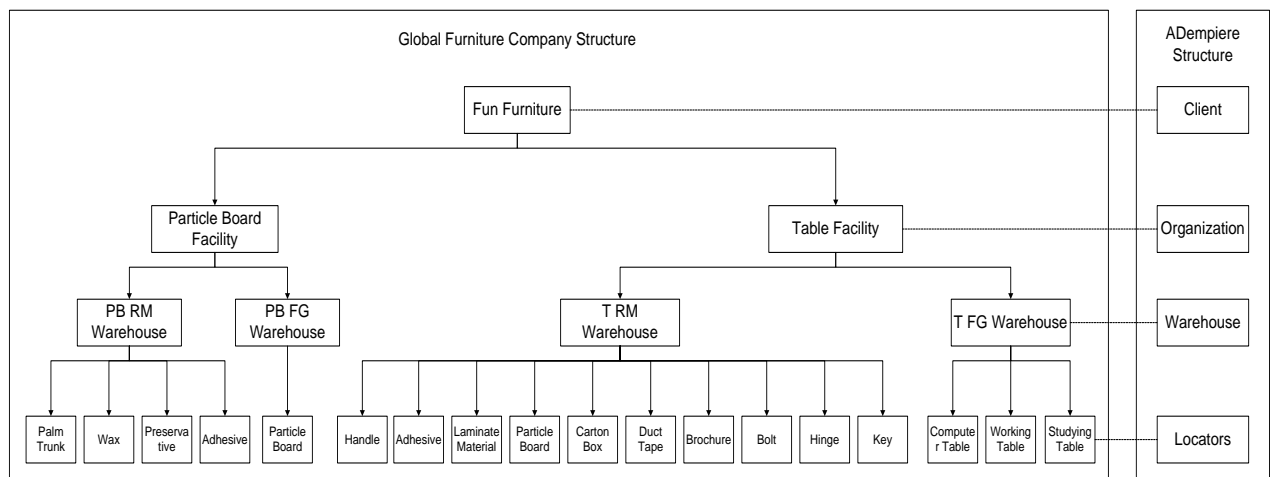


Figure. 1. Company Structure

- d. Defining the calendar year and period of ADempiere for Global Furniture Company. In this step there will be setting up for the calendar year and period for 2012 from January until December for Global Furniture Company.
- e. Setting up some required master data of Table Facility of Global Furniture Company into ADempiere. The setting up process consists of several steps, including:
  - e.1 Managing business partner of Table Facility of Global Furniture Company. This business partner management process consists of three steps. The first one is creating business partner group for grouping the location or area of business partner of Table Facility of Global Furniture Company. The second and the third one are

vendor registration process and customer registration process for Table Facility of Global Furniture Company.

- e.2 Registering the products that are exist in the company, either raw materials, work in process, or finished goods of Table Facility of Global Furniture Company. This figure below shows the customization of products of Global Furniture Company.
- e.3 Registering the product attributes of Table Facility in Global Furniture Company, both raw materials and finished goods. Not all of the raw materials available in the Global Furniture Company have attributes, only some of the raw materials such as laminated materials, carton box, and brochure. Meanwhile, all of the

finished goods of Global Furniture Company have the color attributes.

e.4 Managing some financial aspects of Table Facility in Global Furniture Company. The management process consists of the bank information managing steps that will manage the company's bank account information, currency used, and register the entire product price in the company, whether in the form of raw materials or finished goods.

f. Managing Bill of Materials (BOM) for finished goods of Table Facility in Global Furniture Company such as Working Table, Studying Table, and Computer Table.

### 3. SYSTEMIZATION

Furthermore, once the customization process is completely conducted, the research step continues to the systemization process which aims to manage the real case study which deals with the order of customer of Global Furniture Company, as well as to ensure that the customization process runs correctly hence the systemization process could be conducted. Here, in this part, the research is only focusing on the systemization of Table Facility in Global Furniture Company. The process of customization is conducted based on the business process of the Global Furniture Company. Figure 3 below shows a picture of the business process from Global Furniture Company, while Figure 4 is a picture of the systemization flow that has been conducted.

Product	Client	Organization	Search Key	Version No	Name	Description	Comment/Help	Document Note	UPC/EAN	Sk
Bahan Laminasi	Global Furniture	*	Bahan Laminasi		Bahan Laminasi	Bahan Laminasi				
batang kelapa sawit	Global Furniture	*	batang kelapa sawit		batang kelapa sawit	batang kelapa sawit				
Baut	Global Furniture	*	Baut		Baut	Baut				
brosur	Global Furniture	*	brosur		brosur	brosur				
engsel	Global Furniture	*	engsel		engsel	engsel				
handle pintu	Global Furniture	*	handle pintu		handle pintu	handle pintu				
karton boks	Global Furniture	*	karton boks		karton boks	karton boks				
kunci	Global Furniture	*	kunci		kunci	kunci				
lakban	Global Furniture	*	lakban		lakban	lakban				
lilin	Global Furniture	*	lilin		lilin	lilin				
Meja Belajar	Global Furniture	*	Meja Belajar		Meja Belajar	Meja Belajar				
Meja Kerja	Global Furniture	*	Meja Kerja		Meja Kerja	Meja Kerja				
Meja Komputer	Global Furniture	*	Meja Komputer		Meja Komputer	Meja Komputer				
papan partikel FG	Global Furniture	*	papan partikel FG		papan partikel FG	papan partikel FG				
papan partikel rw	Global Furniture	*	papan partikel rw		papan partikel rw	papan partikel rw				
pengawet	Global Furniture	*	pengawet		pengawet	pengawet				
perekat meja	Global Furniture	*	perekat meja		perekat meja	perekat meja				
perekat pp	Global Furniture	*	perekat pp		perekat pp	perekat pp				
Standard	Global Furniture	Pabrik Papan Partikel	Standard		Standard					

Figure 2. Lists of Products

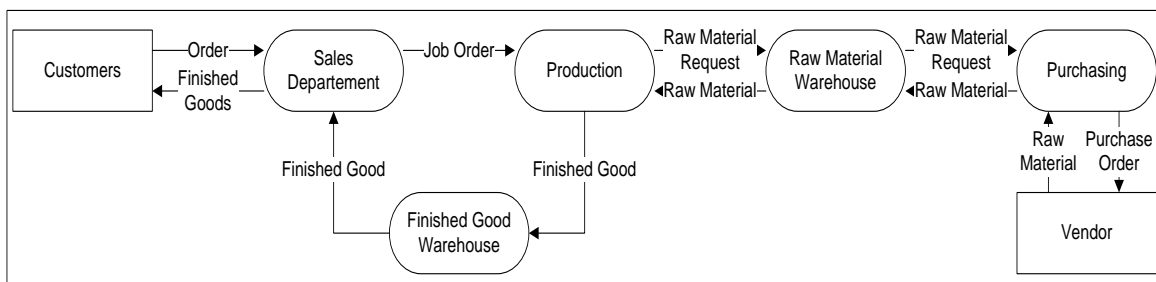


Figure 3. Information and Goods Flow of Global Furniture





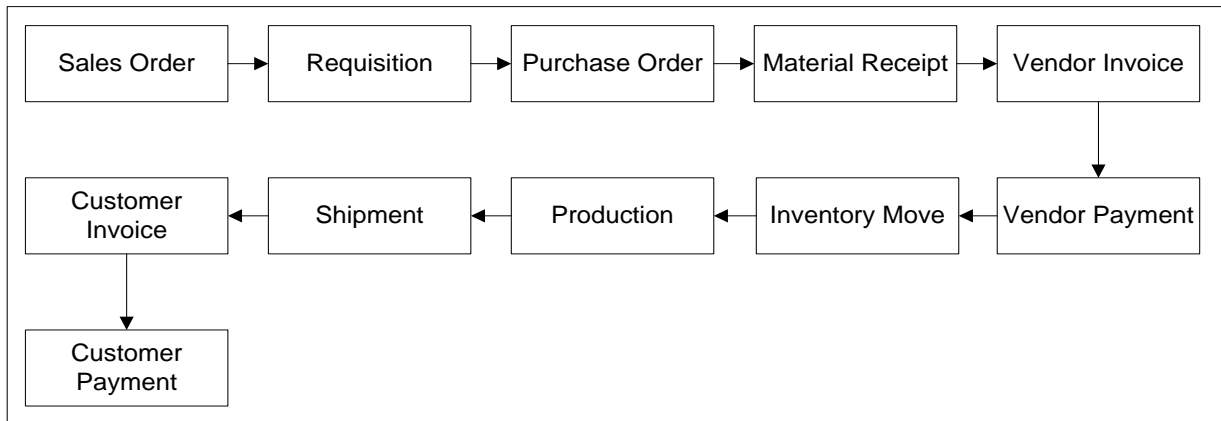


Figure 4. Systemization Flow

As seen in Fig. 4 above, the systemization process that has been conducted is already adjusted to the flow of information and goods that have been previously described. Order from the customer would be defined in ADempiere using the sales order. Further, before starting the production process, Global Furniture, in this case Table Facility should procure raw materials needed for production. Raw materials procurement process is defined in several processes; those are the step of listing requirements of the raw material which is called requisition, ordering step which is called purchase order, raw material receipt step, invoice management step, and payment step. Before the production process could be performed, all of the materials needed have to be stored at the same place. Therefore, in the next step, all materials that previously stored separately in the different locators would be moved into one single locator. This step is called the inventory move step. Then, as the entire materials collected in the same locator, the production process is now able to be performed. After the production process is completed, and the finished goods have been stored in the Finished Goods Warehouse of Table Facility, then the next step is to deliver the finished goods to the customer, manages the invoice for the customer, and the last is to manage the customer payment.

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#### 5. CONCLUSION

Based on the previous explanation, it can be concluded that the customization and systemization process of open source ERP system has been conducted well based on predetermined case study.

The customization process covers some aspects; those are Company Structure, Chart of Account, Calendar Year and Period, Business Partner Group, Vendors, Customers, Products, Product Attributes, Bank Account, Currency, Price, and Bill of Material.

Meanwhile, the systemization process is conducted through Sales Order, Requisition, Purchase Order, Material Receipt, Vendor Invoice, Vendor Payment, Inventory Move, Production, Shipment, Customer Invoice, and Customer Payment.

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