



Evaluation of ERP Selection System in Small & Medium Workshop Enterprise

Sinanuri Surawijaya, Galih Prakoso, Iwan Syahrial, Euis Nina S. Y.

Master of Industrial Engineering, Graduate School, Mercu Buana University, Indonesia

Abstract Companies with resources and limited financial situation is not an obstacle to implementing ERP. On the other hand, with limited human resources that have implemented ERP systems to help control the running of the business processes for small and medium enterprises. The aim of this study is to make ERP software selection process in accordance with the business to a company workshop in the industrial area of Cikarang Delta Silicon 2. The method used to determine the appropriate ERP software is to use 5 stage. First, define business processes that take place. Second, providing develop alternative software which might be applied in the company. Third, the software has a feature set that is close to standard business processes, then specify a unique business process and the latest is the customization of the software. From 5 open source software options are 1 software that best fits the company's business processes are iDempiere.

Keywords Selection, ERP Software, Business Processes

1. Introduction

In recent years competition in the industry in Indonesia is extremely tight, especially especially with the new entrants company (newcomer) who appears to have a much better strength. The Company's have long-standing should to dare to compete with companies newcomers. On the other hand, with the weaknesses of global economic downturn caused a decline in purchasing power that can reduce the need, so that it will lead to a trend in which inventories (supply) exceeds demand market. It required an integrated system or method that can provide important information so that companies can quickly and easily control its production costs to be kept to a minimum.

The concept of ERP is a system that integrates the process of each line in the company's management transparency and accountability are high enough. To enter the international market, ERP is one that becomes a basic pre-requisite for any company. Indonesia is a developing country, where the economic base rests in the field of business, then the efficiency is one factor that is important in every company. ERP implementation is usually done on large companies in Indonesia for integrating and optimizing every business process within the enterprise into a computerized system

Small firms (SMEs) are very rarely do implementasian ERP because it was very difficult to apply even the rationale for applying the integrated system as if still a novelty. For smaller companies (SMEs), there are several methodologies in the ERP implementation process so that it can appropriate with the requirements and needs in order to support the business processes of the company's activities [1]. In this case, the research carried out at a workshop company that engages in the services of the machining process in Cikarang industrial estate. Machining process that took place in this workshop is the process of CNC Milling, CNC Lathe, CNC Grinding and machining process using conventional machines.

The company plans to implement an ERP system, this is done because at this time the entire process in the company is still done manually between departments so often errors in the information provided for each department. Selection of the appropriate ERP software for the company's workshop in the course of production is



needed to keep the cost required for the implementation of the ERP system can be suppressed and the ERP program obtained also in accordance with the company's business processes.

2. Literature Review

In a complex organization with many departments to carry out the functions and objectives of each, often occurs biased information, perception and decision-making positions between one department with another department. Enterprise Resource Planning (ERP) is a cross-functional enterprise system is driven by an integrated suite of software modules that support basic internal business processes of each company [2]. According Marnewick and Labuschagne (2005) in Alok and Mocherla (2016) [2], ERP enables organizations to automate and integrate the majority of its business processes, share common data and practices across the company as well as generate and access corporate information in real-time. In addition, ERP has been promoted as a link desirable and important to improve the integration between all functional areas within a manufacturing company, and between the company and its trading partners from upstream to downstream [2].

ERP system is an application that has the most important developments in the use of information technology in the company in the 1990s' [3]. ERP implementation typically requires a considerable cost, complex projects, involving large groups of people and other resources, working under time pressure and face many unexpected development. Not surprisingly, many of the ERP implementation in the company to be less successful than its original purpose [3]. ERP uses Internet technology to integrate the flow of information from internal business functions and information from customers and suppliers. The system uses a relational database management system, the architecture of client / server network, to capture valuable data management [4].

In its application, the use of ERP systems is very beneficial to the production process in the business conducted by the company. The benefits can be felt by the company include: (a) There is a significant direct relationship between the implementation of ERP and (continuous improvement, productivity of the company, improvement in customers' services, communication cost, risk of price miscalculation and operation process), (b) operating activities become faster, so there is no wasted time for employees to acquire data or send the data, because data is available on time., (c) Implementation of ERP improves productivity and enhances customers' services, because goods and services are available on time without any delay, (d) Implementation of ERP improves the production cycle, and cost reduction improvements are due to reducing the number of mistakes, so that work is going on in order and on time with very few mistakes. This leads to fastening the processes and reducing the operation costs, (e) Implementation of ERP leads to improve the production process and the stock procurement process.

Implementation of the ERP system will be done by a company will face many challenges that must be addressed so that the application can be run smoothly and successfully. Where the challenge could be: (a) the variation of complex products, (b) the production process with the needs of production scheduling must be defined where the current ERP system can handle these conditions, (c) the assignment of continuous product to process different and work orders [5].

In making the selection of the right ERP software to be applicable in companies with small and medium scale there are three basic components that are needed, namely the function of ERP systems, business processes today and the needs and requirements of the company. The analytical method used in this study to determine the functional requirements in selecting ERP applications can be seen in Figure 2.1 [1].

From the analysis method in Figure 2.1. can be described steps in the selection of ERP software industry small and medium enterprises, namely:

- Classification of Business Processes
- Comparing the software alternatives
- Business Process Analysis suite with software features
- Unique Business Process Analysis

Customization ERP modules selected by the previous step



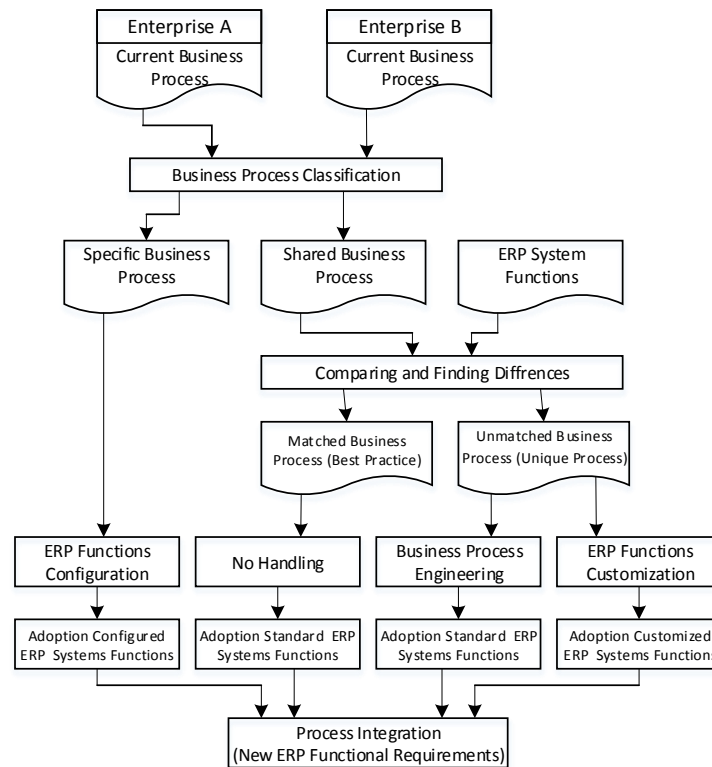


Figure 2.1: Requirements Analysis Method

3. Methodology

In this research, using qualitative and quantitative methods, where quantitative methods used to determine the business processes currently owned by the company so that it can provide information about system requirements in the company that was then used to examine the criteria, sub-criteria and alternatives are used in the selection of software. While qualitative methods are used to select the software to be used based on the established criteria. The object that becomes a study of small and medium enterprise shaped workshop engaged in the services of the machining process in an industrial area of Cikarang.

Analysis & Discussion

1. Current Business Process Analysis (Step one)

Business processes that take place at this time (table 1) is to take place manually using the mail messaging. Letter of acceptance of this order using carbon copy paper 4 copies to be distributed to several departments for further processing.

Table 1: The Company’s Business Processes

Department					
Marketing	Engineering	Purchasing	PPIC	Production & QC	Accounting
Customer PO	Material Request	Material Order	Production Scheduling	Production Process	Delivery Note & Invoice
Order Receipt Note	Process Estimation		Delivery	Inspection (NG/OK)	Delivery Order

Business processes according to the process flow in table 1 of the companies asked not to be changed because it is in accordance with the company's business model and was quite effective. Therefore, the software selection can be based on the existing business processes, and software which has the features that are approaching the business processes.

2. Comparing the features of ERP (Step two)

Table 2: Comparing of ERP Software

iDempiere	ODOO	WebERP	Openbravo	ERPNext
a. Engineering Management	a. Manufacturing Planning	a. Sales Orders and Quotations	a. Procurement Management	a. Bill Of Materials
b. Planning Management	b. Manufacturing Process	b. Accounts Receivable	b. Warehouse Management	b. Production Order
c. Production Management	c. Manufacturing Control	c. User defined sales analysis	c. Production Management	c. WorkstationOperation
d. Distribution Management	d. Bill of materials	d. Purchase Orders	d. Sales Management	d. Subcontracting
e. Quality Management	e. Routing/process planning inventory & Manufacturing Analytics.	e. Accounts Payable	e. Project & Service Management	e. Tools Production
f. Standard Costing Management	f. Quality control	f. Inventory Management	f. Project Management	f. Planning Tool
	g. Machine runtime & downtime	g. Multi-currency bank accounts	g. Service Management	g. BOM Replace Tool
		h. Shipment Costing	h. Customer Relationship Management	h. Setup Manufacturing
		i. Contract Costing	i. Financial Management	i. SettingsArticles
		j. General Ledger	j. Master Data Management	j. Nested BOM Structure
		k. Manufacturing Multi-language		k. Production Planning & Subassembly
		l. Multi-currency, complex tax system support.		l. Valuation Based On in BOM
		m. Multiple inventory locations with serial number and lot tracking facilities		
		n. Fixed Assets		
		o. Full double entry accounting		
		p. Sales orders support assemblies and kit-sets		
		q. Supports Materials Requirements Planning (MRP I)		

Workshop machining process on the company is included in the category of medium-sized enterprises with a turnover seen sales by 1.5 to 2 billion rupiah per month even if viewed in terms of a workforce of just less than 50 people. For middle-class industry certainly is not appropriate to apply the ERP with the high costs such as SAP, Oracle or Compiere. Based on the industrial scale, the company is not including big industry that would be more appropriate to use the ERP system with the software provided is open to the public or that is more often referred to as open source. Although open source does not mean 100% free, but there is a charge of third-party



development due to the need for customization features used by the company as well as maintenance costs for the software. Software options that can be used seen in table 2.

In table 2 are the features provided by 5 open source software that is used as a reference to be implemented in the company. The reason for choosing software above for 5 open source software that provides module manufacturing. In the manufacturing modules are the details of the above-mentioned features correspond.

3. Matching Business Process with ERP Software (Step three)

ERP selection of the alternatives that have been given, then the next step is to choose a suitable alternative ERP or close to existing business processes. WebERP seen a focus on accounting, financial and stock control manufacturing so less in accordance with the existing business processes in the company so that the only remaining four alternative options. Features that are not in accordance with the company's business processes is removed so that only the remaining features that are required by the company.

Table 3: ERP Software Selected

iDempiere	ODOO	Openbravo	ERPNext
a. Engineering Management	a. Manufacturing Planning	a. Procurement Management	a. Bill Of Materials
b. Planning Management	b. Manufacturing Process	b. Production Management	b. Tools Production
c. Production Management	c. Manufacturing Control	c. Project & Service Management	c. Planning Tool
d. Distribution Management	d. Bill of materials	d. Financial Management	d. Production Planning & Subassembly
e. Quality Management	e. Quality control		
f. Standard Costing Management			
Result			
Excellent Matched	Good Matched	Matched Enough	Matched Enough

The results of the filtering feature in the 4 ERP software that has been done can show that the software iDempiere are the best choices to be implemented in the workshop company's. Features manufacturing standards given iDempiere software approach business process that currently take place in the company.

4. Unique Processes (Step Four)

Machining workshop Company's has the characteristics of job shop or job order. In contrast to manufacturing in general that every process of making the same product, characteristics of job shop is for any products made with each sequence of processes have different machines and different time anyway. So it needs special addition to scheduling with type Jobshop.

5. Configuration ERP System (Step Five)

Based on the results of step 1-4 and then configure an ERP. If companies choose software iDempiere, then the company simply add a special feature for scheduling with Jobshop system so many standard features not modified. Software ODOO still has weaknesses in its standard feature that is not yet accommodate the needs of engineering, companies need to add features for engineering and setting characteristics of job shop system. Then, for Openbravo and ERPNext need to add a feature associated with quality control and engineering in addition to scheduling menu Jobshop characteristics. Best software course is iDempiere ERP software. Nonetheless, beyond the existing business processes, another software has a feature that does not exist on iDempiere manufacture modules such as CRM, Maintenance, etc.

5. Conclusion

Selection of ERP software that is appropriate to the business processes that take place in the company's helpful to support the performance of the company itself so that it is not necessary to do business process re-engineering when it will be implemented ERP. The results showed that the workshop company is most



appropriate use ERP software iDempiere with the addition of scheduling adjustments to Jobshop. Although at the end of the existing alternative-alternative can be selected in accordance with the budget provided by the company. The other 3 software even though it needs more additions of standard features, the cost can be cheaper than iDempiere and is also easier to use or development.

Limitations of this study is the lack of reviews quantitatively both time and cost for the detail of each alternative software. This is because the nature of open source software although free but still need to pay the cost of third parties in the development and maintenance. Every software developer to fix different prices depending on the agreement with the company that it is difficult to consider the cost and time factor. Nevertheless, a qualitative overview of the ERP software selection based upon features that correspond to the business process can be an alternative in choosing ERP software for the purpose of ERP implementation can be accomplished according to the target company.

References

- [1]. Khaleel, Y., Abuhamdah, A., Sara, M. A., & Al-Tamimi, B. (2016). Components and Analysis Method of Enterprise Resource Planning (ERP) Requirements in Small and Medium Enterprises (SMEs). *International Journal of Electrical and Computer Engineering (IJECE)*, 6(2), 682-689.
- [2]. Alok, S., & Mocherla, J. (2016). Predicting the behavioral intention to use ERP: An empirical study on the manufacturing industry. *IUP Journal of Operations Management*, 15(1), 7-24. Retrieved from <http://search.proquest.com/docview/1771703336?accountid=34643>
- [3]. Akkermans, H., & van Helden, K. (2002). Vicious and virtuous cycles in ERP implementation: a case study of interrelations between critical success factors. *European Journal of Information Systems*, 11(1), 35-46.
- [4]. Yusuf, Y., Gunasekaran, A., & Abthorpe, M. S. (2004). Enterprise information systems project implementation: A case study of ERP in Rolls-Royce. *International Journal of Production Economics*, 87(3), 251-266.
- [5]. Sinha, Abhinav., Sinha, Abhishek. (2016). Enterprise Resource Planning Design Challenges for Steel Industries. *IRACST- International Journal of Research in Management & Technology (IJRMT)*, Vol.6, No.4, July-August 2016.

