

[MAN 16] THE EFFECTIVENESS OF ERP IMPLEMENTATION IN MANUFACTURING INDUSTRY

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ABSTRACT

The purpose of this study is to discuss the effectiveness of ERP implementation in the manufacturing industry. The manufacturing industry has discovered the effectiveness of the ERP system but also facing some challenges in the adoption of ERP. In Malaysia, there are lacks of ERP implementation in the manufacturing industry due to its complexity, cost and time-consuming. This study covers the benefits, challenges, and the implementation across the organization. The data collections were collected from primary data and secondary data. In the primary data, an interview with a manufacturing company is conducted in order to gain more knowledge regarding the topic. Meanwhile, the secondary data is obtained from the literature review from journals, books, articles and the internet. This study identifies the effectiveness of ERP implementation. The identified factors provide a foundation for identifying the effectiveness of ERP implementation and give a direction for further improvement. Besides that, the analysis conducted shows that ERP implementation has the effectiveness in automating the entire business processes and the improvement in productivity and performance in the manufacturing industry.

Keywords: *Enterprise Resource Planning, effectiveness, manufacturing industry*

INTRODUCTION

Organization nowadays is frequently searching for the best ways to improve their business performance in more effective and efficiency processes in order to sustain competitive advantages in the global market. To achieve the goals, the manufacturing needs to upgrade their production technology in order to improve their productivity. Through a solid information business system, Enterprise Resource Planning (ERP) is business process management software that allows an organization to use a system of integrated applications to manage the business and automate many back office functions (Beal, 2015). Manufacturing industry need to seek for ERP system as it is able to solve many challenges and provide valuable benefits such as reduce cost, streamline processes, manage growth and gain a competitive advantage (WorkWise, 2013) ERP system can help an organization's administrators monitor and manage supply chain, sales and distribution, inventory, finance, logistic, human resource and other mission-critical components of a business through a series of interconnected executive dashboards (Rouse, 2014). Besides that, ERP system is a system that able to integrate all these systems into a single database which is more effective in internal and external communication and data transfer (Shamsudin, 2008).

Furthermore, ERP system allows standardization and centralization of information and transforms it into useful data which is very helpful for the company in making the right decision. In fact, this system able to improve the company's competitiveness by providing easier way to access the important and right information which in turns of making appropriate decision faster (David, Khondkar & Robert, 2009). Manufacturing industries in Malaysia are facing many challenges in implementing ERP systems due to the lacking support from human and financial resources. In fact, the manufacturing companies in Malaysia is increasing and the competitive environment between companies is aggressive provides great opportunities for ERP vendors to infiltrate Malaysian market (Shatat & Udin, 2012). ERP implementation requires the development of new procedures, training and converting data (Khaparde, 2012). However, ERP system allows the company has a better understanding of the overall business situation and provide the ability to generate any necessary reports; ERP system has the benefits of unlimited (Dunaway & Bristow, 2011).

STATEMENT OF PROBLEM

Although many studies indicated that ERP system significantly improved a company's effectiveness in the overall business process, actual results of many ERP systems had a failure to gain significant benefits of its system. An ERP system implementation must have defined the goals and expectations clearly in every industry. However, the industry still will report failed to partially even though they had followed the correct step to define their goals and expectations clearly (Graham, 2009). Most of the failure of ERP implementation was not caused by the system itself but causes the large number of changes resulting from the ERP's high complexity of the organization (Seo, 2013). In addition, a lot of adjustments need to be done on the design and system analysis in the software of ERP system but system implementation management is a very challenging issue (Holland & Light, 2014).

The main reason of this issue is that ERP implementation requires a huge investment in money, resources and time (Azhar & Mallikarjuna, 2016). An ERP system takes the longer time to understand an implement. Hershey made a mistake as it tried to fit a complex ERP implementation project into an unreasonably short timeline which leads to failure of the system (Gross, 2013). Furthermore, the cost of an ERP implementation can be unpredictable as the organizations take more time to plan for their project costs which normally will cause over budgets. There are 63% of manufacturing industry implement the ERP system go over budget which exceeding the expected cost by an average of over \$3 million. According to the Panorama's research stated that the cost of ERP implementation in the manufacturing industry is \$11.4 million which is higher than of all industries which only cost \$9.8 million. This is because ERP system in manufacturing industry requires more customization (Panorama Consulting Solution, 2014).

The lack of further explanation of the effectiveness of ERP implementation in manufacturing industry is one of the reasons of this research studied (Abugabah & Sanzogni, 2010). In Malaysia, it was found that majority of the manufacturing industry do not aware about the ERP system and only a few organizations had implemented the system. According to iControl Software, chief executive officer, Frank Lee said ERP implementation in the manufacturing sector in Malaysia is low compared to another

country due to the complexity of the adoption process (iControl Asian Business Culture, 2016). Hence, it is significant to seek for the effectiveness of ERP implementation in the manufacturing industry including its challenges in order to meet the requirement and satisfaction to the company involved. Therefore, the purpose of this research is:-

- a) to identify the benefits of ERP system implementation in the manufacturing industry to achieve the goals and expectations in more effectiveness.
- b) to explore the challenges involved when using the ERP system during the business processes in manufacturing industry.
- c) to explore the effectiveness of ERP system in business function in the manufacturing industry.

LITERATURE REVIEW

There several kinds of literature that had been review and the review is categorized into benefits of ERP system, challenges of ERP implementation and ERP systems functionality.

Benefit of ERP system

ERP system must be dynamic, scalable enough to match the growth of the business and will form a standard best business process by the centralized system based on organization best practice (Saleh, 2016). Moreover, ERP system is able to provide and gather the correct data needed in order to maximize the efficiency of business process across the entire organization (Jetley, 2016). According to Cesarini and Gunnarsson (2014), there are four dimensions of ERP benefits:-

Operational Benefits; ERP systems can improve the level of automation, thereby eliminating unnecessary processes which bring an outcome of cost reduction. Besides that, ERP enable the improvement of productivity of the great management on products produced and delivery to the customer effectively. The duplication and error rate decrease and the accuracy and reliability of information improved which can lead to quality improvement (Burnson, 2016).

Managerial Benefits; ERP system is able to reduce stock and increase turnover which as a result of better inventory management. Besides, ERP system improved the human resource management as well by allocating and utilization of employees based on their experience and skills. Integration of data into a single system provides the ability to generate operative data which enable the organization to make the better decision effectively. Furthermore, ERP provides better performance control enables the organization experience the overall improvement in operational management effectiveness and efficiency (Rajesh, 2011).

Strategic Benefits; ERP system can support business alliances. Newly acquired businesses can be effectively incorporated into an organization's standard business practices. ERP is able to build external linkage into the system. Besides, ERP system enables worldwide expansion by having the ability to handle global resource management, global market penetration, and cost-effectively (Rajesh, 2011).

Infrastructure Benefits; ERP system enables the organization can respond faster, cost-effectively and provide some alternatives for internal and external changes in order to increase business flexibility (Cesarini & Gunnarsson, 2014).

Challenges of ERP implementation

Manufacturers face more challenges than non-manufacturing companies on ERP implementation. They do tend to have more complex business processes (Ann, 2014). According to Hall (2014), the challenges need to be considered during the implementation such as:

Bing Bang Approach; ERP system functions as an independent system which does not integrate with the existing system in an organization. This issue has proven to be ineffective and inefficient and even worse that will lead to the failure of implementing the ERP system (Hall, 2014).

Choosing the Wrong ERP; Choosing the right ERP system to fit into the organization's culture and its business processes is very important in order to achieve the effectiveness. This is because if choosing an inappropriate ERP system can cause a lot of problems to the organization as it will weight down the entire organization (Needle, 2014).

High Cost; ERP system is extremely expensive to implement. Panorama found that 57% of manufacturing industries overstep their ERP budget and they tend to experience bigger overruns by an average of \$3.8 million (Panorama Consulting Solution, 2016). The main reason of the ERP budget overrun is due to the organization underestimate and unanticipated costs. ERP system required additional costs such as training, integration, testing, maintenance, adjustment, data conversion from old systems and consulting fees which cause the organization overrun their budget (Rajesh, 2011).

ERP systems in business functions

ERP system can improve the accuracy, quality, speed and availability of information in every internal corporate relationship (Sulaiman, 2013). ERP system in business functions are:-

Operations and Logistics; ERP system improves the order management, improves interaction between the business partner and unit, and able to generate different product based on the customers' needs and the market. By implementing the ERP system, the data and information between the business unit will be facilitated, as a result, the communication and interaction between them go effectively and efficiently (Sulaiman, 2013).

Human Resource; The management of human resources and human capitals can be simplified by ERP system. ERP system enables the organization to preserve a complete employee database including their attendance, salary details, performance evaluation, contact information, promotion and compensation of all employees. This ability provides another department to access specific employee data easily (Ross, 2015).

Financial; The manufacturer can implement the ERP system to manage the financial management which can streamline accounting, consolidation, process scheduling, workflow, and collaboration. By implementing the ERP system, financial data accuracy increase which can support the faster decision-making capability (Sulaiman, 2013).

Sales and Marketing; ERP system enables the organization to access the latest information of the customer. ERP system can minimize the errors in data entry and provide real-time information. The employees can track all transaction involved in the sales order. It also provides a full picture of customers' activities, creates opportunities for sales, and manage order fulfilment (Jandu, 2014).

Suppliers; ERP system is able to improve supplier performance by setting an alert with the system. ERP system records every transaction including the date, time and quantity. The organization can use the alert tool to remind them when the stock is low. This will improve the interaction between both parties and increase the effectiveness in order process (Miller, 2015).

RESEARCH METHODOLOGY

Primary data

Interview; The interview is the method for the researcher to understand clearly regarding her study field. According to Degu and Yigzaw (2006), there are two types of qualitative interviews which are semi-structured or unstructured. In this research, the researcher used the semi-structure interview to gather the information needed and a set of was prepared in order to collect the data in more accurately and efficiency. This is an opportunity for the interviewee and interviewer to interact in order to discuss and gain more information in detail to accomplish the research.

Questionnaires; There are two sections in the interview questions which are:

1. Aspect demography
 - a. May I know your name?
 - b. Which department are you?
 - c. May I know your position in the department?
2. Aspect benefits of ERP system (Seo, 2013)
 - a. Did the ERP system show immediate benefits upon start-up?
 - b. How would the use of ERP become more efficient?
3. Aspect challenges of ERP system (Elbardan, 2014)
 - a. What were the project period and costs? Estimated vs. Actual
 - b. How long did it take to stabilize the ERP system?
 - c. What are the problematic areas in ERP system and how would you solve these problems?
 - d. What are the challenges that your organization faces after implementing the ERP systems?
4. Aspect of ERP in business functions (Kotiranta, 2012)
 - a. How was the communication changed between employees?
 - b. How well are internal and external communication and information sharing working?

Secondary data

Literature review; The literature review provided a general overview of the information on the specific topic for the researcher and also to demonstrate how the research is fit into the larger field of study (Labaree, 2009). In this research, the researcher had studied several journal articles regarding the research topic and made the review. The data

collected are used by the researcher and also helped the researcher has a better understanding on the topic that wants to study.

DATA ANALYSIS AND FINDINGS

The analysis of data is done from the data collected from an interview at a manufacturing industry, Panasonic Appliances Refrigeration Devices Malaysia Sdn Bhd (PAPRDMY) which is located at Cheng, Melaka. All the information and data collected from the process of the interview by asking a list of questions. The interview was conducted with Mr. Yap Hock Heng, Information System Centre Team Leader in PAPRDMY. During the interview section, the researcher focused on the effectiveness of ERP implementation in the company. Data were analysed to identify the benefits of ERP system, challenges of ERP implementation and the ERP system in business functions in the company in order to improve its effectiveness.

Aspect benefits of ERP system

PAPRDMY had implemented the ERP system since the year 2013. ERP system brings benefits to the company and improves their effectiveness. The benefits that gained by the company of ERP implementation are:

Single Business Management; As PAPRDMY is a global organization needed to consider the biggest differences in geography and culture. ERP systems allow company to break down these cultural and geographic barriers and enable people to work together in an efficient manner and with the best possible processes. The organizations are able to monitor every company through the system which is more effective than manually monitoring.

Standardization; ERP system allows standardization of information and transforms it into useful data which is very helpful for the organization in making the right decision. ERP systems help the company optimize and standardize business processes while encouraging best practices across the organization (Interview, 2016) Standardization processes and information lead to better performance, more efficient people and enable the organization to use company-wide standards (Richards, 2013).

Automation; ERP system enables an organization's planning goes automatically from the raw material processes through the final products. It is very effective way of planning in the manufacturing industry. Planning automatically can reduce human mistake and well control on the production cost.

Systematic; ERP system provides a systematic management for all information including the coding of the part, quantity, price, and date. All the information has to key into the system. Hence, every process must be discreet and also avoid been modified by other people which provides all the information in more transparency and more accuracy way.

High-security system; ERP system enables an organization to secure their private and confidential information by setting the authority level in the top management employee. The confidential information only can be access by the top management that has the authority to access.

Aspect challenges of ERP implementation

PAPRDMY faced some challenges during the ERP implementation but they are able to solve it with their excellent management.

System Breakdown; When the ERP system breakdown, all the processes are stopped functioning which bring a challenge to the company. The system is control by the dedicating system and the company only focused on troubleshooting. When the system is breakdown, the company will solve the problem within 24 hours to avoid from affected the production processes. Therefore, to avoid the issue above, the company had maintenance on the system every end of the month.

High cost; ERP system is a very high-cost system. PAPRDMY spent around RM 2 million to adopt the ERP system and spent roughly RM 810,000 every month for the user ID. Although the cost is high, the company did not overrun their estimation cost and it is under control.

Lack of user's knowledge; ERP system is new for the company and it is more complex for the non-IT base user. Although the company had provided 5 months of training and consultant for the user, it took longer time for the user to get used of the system without any mistakes and delay. Poor knowledge of the user causes the poor quality data entered into the system.

Aspect of ERP in business functions

ERP system consists of many functions modules. PAPRDMY had chosen the main five functions modules to operate the business processes effectively. The five functions modules are:-

Finance; This is the most important modules since every department are integrated into financials. This module including balance sheet, accounts receivable, accounts payable, cash management, budget, general ledger and much more. This is the core module of the organization and collects financial information from other departments to prepare balances and financial report in an effective way.

Master Plan Schedule; ERP master module is designed for the material creator for the products. It integrates with the financial, production and material control to generate accurate information for the materials including the material coding, quantity, and price.

Production; ERP production module is designed specifically for the specific needs of the manufacturing industry include core capabilities. It facilitates production planning, take orders and deliver products to the customers. It helps an organization handles the optimal use of manpower and machinery and scheduling of productions. It enables the manager to arrange the work in the desired way.

Sales; ERP sales module is an important module for the organization to operate and existence. This enables order scheduling, placement, shipping and invoicing. It integrates with the organization's website which is more effective in making the connection.

Inventory Control (Material Control); ERP systems are able to maintain the level of inventory required in the warehouse. It helps identify inventory requirements, provides replenishment options, report inventory status, monitors material usage, set targets and much more. The material control module integrates with the sales modules to generate alert reports.

DISCUSSION AND CONCLUSION

Discussion

ERP system has becoming a critical part to an organization's success. This is because ERP system enables all the processes run effectively and as a result of saving time, money and resources. Moreover, ERP system facilitates the flow of information between all business functions within an organization and links to external parties. The key goal of implementing ERP system is to centralize the different functions of the organization into a single system enable operations to operate more efficiently.

This study makes a contribution in identifying the benefits, challenges, and business functions of ERP implementation in manufacturing industry. In order to improve the data accuracy, future researcher can conduct a case study of one or two manufacturing companies and make a more detail investigation of the effectiveness of ERP implementation and how well its effects on the outcome. A particular industries or organization size may have different organizational characteristics and the business requirement for ERP systems and this may have a different impact on the effectiveness factors.

Conclusion

By implementing the ERP system enables an organization to improve the productivity and better performance by its integration features through the entire business process. ERP system enables an organization to run its globally business effectively in a timely manner through the standardization of the information. Besides that, it is difficult for an organization to implement the ERP system without any knowledge and consideration. The biggest challenge of the ERP implementation is the system breakdown which brings a slowdown production and a shut-down process to the organization. By understanding the features of the ERP system and its complexity, an organization has the ability to face those challenges by having a good management and planning during the implementation. Every business functions is significant to the effectiveness of the ERP implementation as they are link together during every business process throughout the entire organization.

In conclusion, there is not much research has been conducted regarding the effectiveness of ERP implementation. Therefore, this study was to identify the benefits, challenges, and business functions of ERP system in the manufacturing industry. Through the interview that has been conducted, the researcher can identify more closely related issues, challenges and its functionality that will be faced by the manufacturing industry before they decide to start to implement the ERP system.

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