UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ENTERPRISE RESOURCES PLANNING: A CASE STUDY IN AUTOMOTIVE INDUSTRY

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Engineering Technology

(Process and Technology) (Hons.)

by

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FACULTY OF ENGINEERING TECHNOLOGY

2016

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

TAJUK: **ENTERPRISE RESOURCES PLANNING: A CASE STUDY IN AUTOMOTIVE INDUSTRY**

SESI PENGAJIAN: **2016/17 Semester 1**

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfilment of the requirements for the degree of Bachelor of Manufacturing Engineering Technology (Process and Technology) with Honours. The member of the supervisory committee is as follow:

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Dr. Wan Hasrulnizzam Bin Wan Mahmood

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ABSTRAK

Sistem Perancangan Sumber Enterprise (PSE) digunakan oleh syarikat untuk meningkatkan respon berhubung dengan pelanggan, mengukuhkan perkongsian rantaian PEMbekalan, meningkatkan fleksibiliti, meningkatkan keupayaan membuat keputusan, mengurangkan masa siap projek dengan kos yang lebih rendah. Bagi sesetengah syarikat automotif, ERP digunakan untuk jaminan kebolehpercayaan komponen yang dihasilkan dan untuk memastikan produktiviti produksi secara optimum. Kajian ini membincangkan apa yang telah dilakukan oleh PHN Insdustry iaitu syarikat automotif yang terletak di Shah Alam, Selangor dan Sapura Industrial Berhad di Bangi, Selangor dalam melaksanakan sistem ERP. Segala aspek mengenai sistem ERP telah dinyatakan di dalam literatur. Maklumat dihimpun dengan menggunakan pemerhatian dan perbincangan dalam kumpulan. Keputusan kajian merangkumi pengenalpastian dan pembandingan pelaksanaan sistem ERP dalam syarikat yang dilihat memberi sejumlah kebaikan dan boleh dirujuk oleh syarikat-syarikat automotif lain yang menggunakan sistem ini. Modul-modul yang dilaksanakan dalam sistem ini dikaji dan disenaraikan mengikut kepentingan kepada syarikat.

ABSTRACT

Enterprise Resource Planning (ERP) systems are being utilised by companies to enhance responsiveness in relation to customers, fortify supply chain partnerships, enhance organisational flexibility, improve basic leadership abilities, reduce project completion time and lower costs. For some automotive industries, ERP is used in the company in order to guarantee reliability of components produced and to ensure optimum productivity on production lines. This study concerns exploring what have been done by PHN Industry which is an automotive company located in Shah Alam, Selangor and Sapura Industrial Berhad in Bangi, Selangor in Enterprise Resource Planning System. All the aspects of ERP system had been identified in the literature review. Information are gathered through observation and focus group discussion. The results include identification and comparison of the system implementation in the companies which is seen to have brought several potential benefits and can be referred by other automotive companies using ERP system. The modules implemented in the system are analysed and ranked according to the priority to the company.

DEDICATION

The realisation of this work was only possible due to the several people's collaboration, to which desire to express my gratefulness. To my parents, thank you for your unconditional support with my studies. I am are honoured to have both of you as my parents. Thank you for giving me a chance to prove and improve myself through all my walks of life.

I would like to thank from a special way to Dr. Wan Hasrulnizzam Bin Wan Mahmood for his intellectual advice, guidance, encouragement and regular discussions were very valuable and inspiring in the process of the proposal writing, research undertaking, project making and thesis writing. Last but not least, this thesis would be incomplete without a mention of the support from members. Without them this thesis seemed not interminable and doubt it should ever have been uncompleted.

ACKNOWLEDGEMENT

Alhamdulillah, praise to Allah S.W.T for His Mercy that showered, I able to complete this task. Peace upon to our Prophet Muhammad S.A.W as the best example to human kinds. In completing this dissertation, as partial fulfilment of the requirement Bachelor of Manufacturing Engineering Technology (Process and Technology) with Honours. I am indebted to many individuals for their supports and encouragements. Their contributions are highly valued and appreciated.

Deepest gratitude supervisor, Dr. Wan Hasrulnizzam Bin Wan Mahmood for patience and guidance to make this dissertation easier for me to get it done on time. All the advices, recommendations and comments will always be remembered, not only for the purpose of this dissertation but also in our future study. Not to forget my parents for their undivided love and support that has helped to make it through.

Last but not least, I would like to thank to all my colleagues who walked the same path in achieving our Bachelor, all lectures in Universiti Teknikal Malaysia Melaka (UTeM) for their time and priceless experiences shared. Only Allah S.W.T. is the best in rewarding all these supports and helps.

Thank You.

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AHP	-	Analytical Hierarchy Process
BOM	-	Bill of Material
CR	-	Consistency Ratio
CRM	-	Customer Relationship Management
EDI	-	Electronic data interchange
EOQ	-	Economic Order Quantity
EPMS	-	Employee Performance Management solution
ERP	-	Enterprise Resource Planning
FI	-	Finance
IEEE	-	Institute of Electrical and Electronics Engineers
HR	-	Human Resources
IT	-	Information Technology
IMS	-	Integrated Manufacturing System
KPI	-	Key Performance Indicators
MN	-	Manufacturing
MRP	-	Material Requirements Planning
PSE	-	Perancangan Sumber Enterprise
SAP	-	System Applications and Products
SMEs	-	Small Medium Enterprises
OEMs	-	Original Equipment Manufacturers
OM	-	Order Management
PERODUA	-	Perusahaan Otomobil Kedua Sdn. Bhd.
PP	-	Production planning
PROTON	-	Proton Holdings Berhad
PSM	-	Projek Sarjana Muda
TO	-	Transfer order
TM	-	TeleManagement
UTeM	-	Universiti Teknikal Malaysia Melaka
WM	-	Warehouse Management
WMS	-	Warehouse Management System

CHAPTER 1

INTRODUCTION

1.0 Background

Companies these days are continuously in search for ways to obtain innovative ideas for improving the processes and retaining a competitive edge via effective deployment of assets and enterprise processes. They need to improve customer satisfaction and service as well as pressures of cost reduction, reducing lead time, and quality improvement in order to get better results. Manufacturing companies must improve the productivity by upgrading the primary production technology in order to remain competitive in the global market. Technology can enhance general profitability in diverse courses through an effective arranging and control framework that synchronises planning of all procedures across the association. A level of creative ability in dealing with a solid data system and on-going changes in store network needs with a specific end goal must be accomplished to attain the benefits and advantages in this competitive world. Opportunities for productivity improvement through reduced time loss are critical to organisational survival and these efforts can be driven through enterprise resources planning.

Enterprise Resource Planning (ERP) aims to integrate all departments and functions across an organisation into a single computer system. The system can serve each one of those distinctive departments' specific needs like genuine ERP software through a solid information business structure. For instance, a company could have separate frameworks for buying, order management, human resources, and accounting, each of which would keep up a different information source.

1.1 Problem Statement

Manufacturing companies use resources, infrastructure and needs, as well as the methods of using computer technology to link various functions such as accounting, inventory control and human resources. ERP could be used for forecasting demand of product, ordering the necessary raw materials, establishing production schedules, tracking inventory, allocating costs, and as a key financial measures. ERP also allow companies to replace a tangle of complex computer applications into a single integrated system. However, despite these potential benefits, ERP system also had a number of drawbacks. The early systems tend to be substantial, complicated and costly. Setting up ERP subsequently require new methods, worker preparing, and both administrative and technical support resulting in companies finding it to be a slow and painful process. The companies try various approaches to remain competitive but not all their efforts pay off. Nevertheless, the assembling organisation still need to attempt and enhance the current method executed so that the productivity of the organisation can be improved and a competitive edge against its competitors can be achieved.

Implementing an ERP system is a major information technology decision which requires time and resources, so companies should avoid choosing a vendor too quickly (Loizos, 1998). It is suggested that the needs are carefully evaluated before coming up with a list of business issues they expect the ERP system would help them address. A manufacturing company utilising ERP system cannot succeed without proper implementation that requires more than just understanding the company needs in order for it to succeed. In PHN Industry, they use the best technologies to produce top quality automotive components and parts for its manufacturing and assembly business. To guarantee reliability of components produced with only the highest quality of raw materials used and to ensure optimum productivity on production lines, an integrated manufacturing system (IMS) is utilised, combined with the technical check and balances of highly trained and qualified floor supervisors. As for Sapura Industrial Berhad, the company uses ERP system to address their need in the manufacturing industry, including product life cycle design, resource planning, and inventory tracking. It also helps the company to manage its accounting, customer management, and marketing. This study investigates the ERP system implementation in both

companies on how the system first started, what are needed for the implementation, who is responsible in giving the explanation of how the system works, when and why it is needed in the company, and analyses which is the most important ERP module used in automotive industry.

1.3 Objectives

Specific objectives of this study are:

a) To identify the ERP modules used for automotive industry.
b) To compare ERP system implementation in automotive industries.
c) To analyse which is the most important ERP module in automotive industry.

1.4 Scope of study

This study was conducted in two automotive companies, which are PHN Industry Sdn. Bhd. and Sapura Industrial Berhad. PHN Sdn. Bhd. is located in Shah Alam, Selangor which is a leading manufacturing specialist for metal-based automotive components, and the largest dies manufacturer in Malaysia. As for Sapura Industrial Berhad, it is located in Bangi, Selangor and involves in manufacturing of automotive components through an acquisition of a coil spring business. This study focuses more on investigating the ERP system implemented in these two companies in terms of human resources, inventory, sales and marketing, finance and marketing and others. For data collection, several methods such as observation, simulation, discussion, internet basis resources and PHN as well as Sapura internal sources are used. The duration of this study is estimated to be one year, which started on February 2016 until December 2016. The results may be used as a reference for a further study and research. The results may not apply for other industries of different business operation and measure indicator.

1.5 Significance of Study

The importance of this study are as follows:

a) As a reference for academic studies related to Enterprise Resource Planning in automotive industry.
b) As a reference for automotive industry or organisations related to Enterprise Resource Planning.
c) For readers who would like to understand how PHN Industry Sdn. Bhd. and Sapura Industrial Berhad implement Enterprise Resource Planning in their production.
d) To know which is the most important ERP module to implement in automotive industry.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

Enterprise Resource Planning (ERP) is an amalgamation of a company's information systems designed to bind more closely a variety of company functions including human resources, inventories and financials while simultaneously linking the company to customers and vendors (Dantes and Hasibuan, 2010). It is a process by which a company manages and integrates the important parts of its business using a software that allows a system of integrated applications to manage the business. Its management information system integrates ` s such as planning, purchasing, inventory, sales, marketing, finance, and human resources (Bajahzar et al. 2012). It is also a set of business software tools designed to facilitate the flow of information between all departments or functions within a business (Hailu et al. 2008).

The Enterprise Resource Planning concept includes the basic principles and objectives, primary management and production strategies, used to achieve the mentioned objectives and implant basic principles and the implementation techniques as the practices and procedures of strategy implementation and maintenance.

2.1 Modern Trends in ERP

Companies adopting ERP system are provided with distinct benefits as they can integrate business applications using real-time information. It delivers a number of business benefits by automating basic, repetitive operations (Schniederjans and Yadav, 2013). The modern trends in ERP are:

2.1.1 Vertical Solutions

ERP systems that are more traditional, expensive, off-the-shelf are very difficult to customise. These systems face stiff competition from players within the vertical market. There has been a trend toward offering vertical solutions for various industries, for instance construction, production, and retail (Schniederjans and Yadav, 2013). System Applications and Products (SAP) builds fairly deep levels in vertical markets, whereas Microsoft depends on partners for vertical customisation. Vertical solutions could also be more appealing to small- and medium-sized enterprises (SMEs) that are progressively targeted by niche ERP vendors recently. A move towards SMEs is also a recent trend in the ERP world.

2.1.2 A Move Towards SMEs

New customer growth within the massive firm market is becoming minimal for ERP vendors (Pishdad and Haider, 2013). Instead, a reduction in the cost of computing, a growing importance of information utilisation among companies, and an ever growing technically competent workforce implies that ERP providers are focusing sales growth on the SME market. SMEs are gaining efficiency and competitive advantage through the implementation of ERP systems (Schniederjans and Yadav, 2013).

2.1.3 Customisable ERP

Today's volatile markets need customisable and variable ERP systems. Unlike traditional ERP solutions, vendors are beginning to develop versatile systems on data design that permits easy diversifications without impacting future upgrades of the system (Schniederjans and Yadav, 2013). Such designs also allows for the simple integration of additional "bolt-on" modules, such as customer relationship management (CRM) and business intelligence applications. CRM can facilitate to make organisations sales and customer service functions more effective and efficient.

2.1.4 Collaborative ERP

Collaborative ERP will give measurable advantages to users within the enterprise and across the supply chain. An example of collaborative ERP is the combination and integration of acquainted tools such as Outlook, Excel, and SharePoint with the ERP system for structured access and presentation (Pishdad and Haider, 2013).

2.1.5 Web-enabled ERP

Web-enabled ERP permits stakeholders and / or third parties to access information at any time and from anywhere through the use of Internet connectivity. This has enabled problematic events to be self-addressed immediately and in close of the real-time. Connecting objects that move along the supply chain to the web also will be enabled by mobile computing, and the introduction of mobile ERP.

2.1.6 User-centric, Mobile ERP

ERP systems have been enabled by developments in information technology to become more user-centric. Traditionally, an ERP system would solely be utilised by "enterprise process driven users". These systems would usually be back-office based, and used by managers for manipulation of enterprise-level business processes. However, by addressing aspects of "user experience", up to date ERP systems can be made more responsive. Modern business challenges require that ERP is made relevant for different types of business user, for example, information-driven users who need to use the ERP system in their everyday activities to drive business change and improvement.

2.1.7 Real-time ERP

Future ERP enhancements will require real-time data processing – handling many thousands of events per second. Developments in real-time ERP solutions are becoming more prevalent. Many of the operational and organisational benefits of ERP systems as well as the modern trends in ERP development are aligned with lean thinking. It can be suggested that ERP systems are moving towards becoming lean. This idea can be extended by overviewing lean production, which will guide in the development of a conceptual framework that will be used to guide the investigation.

2.2 Implementation of ERP

An organisation can speed up their processes if the implemented ERP system is successful, with improvement of numerous aspects at the same time such as quality, reliability, minimisation of redundancy and improving customer satisfaction (Yuan et al. 2011). Few studies have suggested numerous approaches that can be used in the ERP system implementation. According to earlier researches, the subsequent steps can be used in the effective deployment of an ERP system:

2.2.1 Planning

This is an initial step that requires an organisation to examine the current software, files, and other information Technology (IT) systems so that areas that need improvement can be determined. This will help the organisation to improve the goals that are supposedly achieved by the ERP system, as well as assessing the key profits that are to be accumulated from implementing this system. Involvement of top management is crucial, other than junior members or staff because it will help to apprehend the requirements and opinions from all the departments to guarantee the system designed meets the majority requirements in a company. Reengineering processes are also involved in planning, which might include reorganisation of numerous processes and removing the ineffective ones.

2.2.2 Training

To accomplish their given duties, employees to take part in the system implementation process need to be sufficiently educated. For small organisations, training includes coaching the employees to use the software packages that come together with the ERP system. This kind of training delivers chances to efficiently deliver the significance of the fresh system in an organisation. Project representatives are sent for huge organisations across various departments. They might deliver essential response to the development team about the possible concern areas. It is important to choose a trusted and reliable members to represent the organisation for a crucial training.

2.2.3 Analysis

After a new ERP module is selected, the paybacks and conservation necessities of the system must be assessed. System forecasters and advisors may be hired to assess the efficiency of applying the system, as well as

selecting the best provider for it. An appropriate vendor must be chosen by shortlisting the entire potential vendors as well as deciding by evaluating the sponsors of the project, cost discussions and contract conditions. The evaluation must be conducted thoroughly as this will affect the ERP system to be used, whether the benefits are enhanced or reduced.

2.2.4 Installation and Testing

The organisation must make sure the underlying hardware is effective and reliable. Determination on how will the system be operated in reference to the use in operations is done by the project team. The ERP system must also be organised to make sure it works articulately with the processes in the organisation. Standardisation of data is required to make sure it is readable by the system later on. The accurateness and significance of the data must be revised once data has been entered into the ERP system database. An examination plan must be formulated to perform a number of tests to avoid any error and ensure everything will run smoothly.

2.2.5 Final Testing

When the ERP implementation is successful, a final review must be done on the project to analyse how can the system be maintained for an extensive period. This phase includes reassessing of extensive period effects as well as the consequences of implementing the system. The organisation must recognise which features of the system can internally be attained, and which can be subcontracted. Another useful approaches that can be applied is developing training courses and centres that prepare the employees the necessary abilities to run and support a new and fresh ERP system in organisation.

2.3 ERP Key Success Factors

Since implementation of ERP is an expensive and risky matter, it is important to comprehend and analyse the critical success factors. By investigating these factors, an organisation is ready to analyse whether the deployment is successful or not beforehand. Then, the organisation can choose whether there are any modifications to be completed or whether the deployment should continue as scheduled. These aspects may vary with different organisations due to the variance in their processes (Zamiri et al. 2010). The following is an inspection of the key success factors that relate to large and small organisations:

2.3.1 Top Management Commitment

The involvement of top management is important in order to ensure a successful implementation of ERP system. Their role is to deliver the necessary leadership skills and capitals required to finish the project. Top management need to understand the benefits of the implementation of the ERP system and facilitate incorporation of the system into the organisation. In addition, upper level management requires payback and feedback from the project, aspects that help succeeding the project (Dantes and Hasibuan, 2010).

2.3.2 A Competent Implementation Team

The individuals involved in the implementation team must be qualified, experienced, and skilled in order to ensure a successful ERP implementation in an organisation (Yuan et al. 2011). They are continuously involved in creating crucial choices that affect the whole organisation. The implementation team progresses the strategy for the whole project; therefore their judgements at this phase determine the achievement of the whole project. The team correspondingly link the management and the other members of the organisation, therefore any choices by the team must represent both opinions.