THE EFFECTIVENESS OF IMPLEMENTING AN ERP SYSTEM FOR RAW MATERIAL (Case Study at PT. Pharmacy)

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Abstract

Inventory is an asset of great value in a company, the ineffectiveness of inventory management will cause problems for the company. This study is intended to evaluate the effectiveness of implementing Enterprise Resources Planning (ERP) in order to find solutions to problems faced by pharmaceutical companies that have very large types and quantities of inventory. This research is a descriptive study, by collecting data using questionnaires distributed to ERP users as well as conducting observations and interviews. The results showed that the ERP applied to the company was effective in terms of system quality, information quality, service quality, user satisfaction, and employee performance.

Keywords: Enterprise resource planning, inventory

Introduction

Inventory, although an activity that does not add value, is very important for the smooth operation of a company. If the company cannot or cannot implement JIT inventory, then good inventory management is needed so that inventory costs are efficient. Inventory management has the goal of achieving a balance between the investment made in inventory and service to customers [1].

PT. Pharmacy is a company engaged in the pharmaceutical industry managing quite a lot of types of supplies used in the production process. The company's stored inventory has a variety of specifications and analysis parameters that vary so that it requires adequate handling to avoid material damage or inventory recording errors in the company's books that are feared to cause losses for the company.

Companies recognize the need to implement good internal controls by applying accounting information systems based on relevant and integrated computer technology. The right system will be able to be used to strive for coordination between units and will eventually be able to be used for precise decision-making to eliminate waste [2]. One computer-based application that can be used to integrate functions in an organization is ERP.

ERP or Enterprise Resource Planning is a method of integration of several business processes such as aspects of operations, production, and distribution of companies. The process of integration of functions within the company is expected to provide products or services on time and at the right price. If the company's main activities use ERP software, it is expected that the company's operations will be more effective, efficient, and can also enable interaction and collaboration of information within the company [3]. The application of ERP is expected to improve control, productivity and help achieve the quality that the company expects in managing its inventory resources.

ERP is widely applied in various manufacturing and service companies. This system is designed to address the problem of information fragments in a business organization. Implementation of the latest ERP technology utilizes the development of digital technology (e.g. the use of web-based ERP, the utilization of cloud computing and, social network computing)to further improve mobility, communication effectiveness, and efficiency, [4]. This is in line with what Kim (2020) said that the application of information technology including ERP becomes important because it can increase productivity, efficiency, and effectiveness.

Some previous studies have found that the implementation of ERP can improve organizational performance, of course, including increasing effectiveness in inventory such as research conducted by [2, 4-8].. However, several studies have also found that ERP is also not able to improve performance. For example, research by [5, 9, 10] no significant difference in firm performance between adopters when testing the before and after effects of ERP implementation over a 3-year period. This study is intended to evaluate the implementation of ERP inventory, whether the performance of inventory operations is more effective with the implementation of ERP.

Enterprise Resource Planning

The implementation of ERP systems was originally the deployment of modules especially for activities within the company such as finance, logistics, and human resources section [7, 11, 12]. ERP vendors continue to add to their product lines by offering ERP systems that have more depth, complexity, and modular integration due to increasing customer demand. Researchers such as [13] found that ERP systems are not just a collection of information processing modules that support various activities within the company and between companies. He argued that systemic concepts underlie ERP system modules and that connections and interdependence between modules improve operational performance.

The company's goal is to create integrated managerial functions, accelerated reporting cycles, and expanded information capabilities [5]. For this goal to be achieved, companies that implement ERP must be able to adapt, structure, and integrate the flow of information and business processes. According to Hong et al., 2010 this must be continuously done because there are always market changes and technologies that must be anticipated so that eventually the company will have agile, lean, and knowledge-based business processes [14-16].Companies, when making business process changes, must combine training programs, operating procedures, and information technology to support the creation of better infrastructure.

This study evaluated inventory ERP using the success framework of the information system developed by [4, 6, 17] in their research. The dimensions used to measure the success of the system consist of: system quality, information quality, service quality, usage, user satisfaction, individual impact and organizational impact[18]

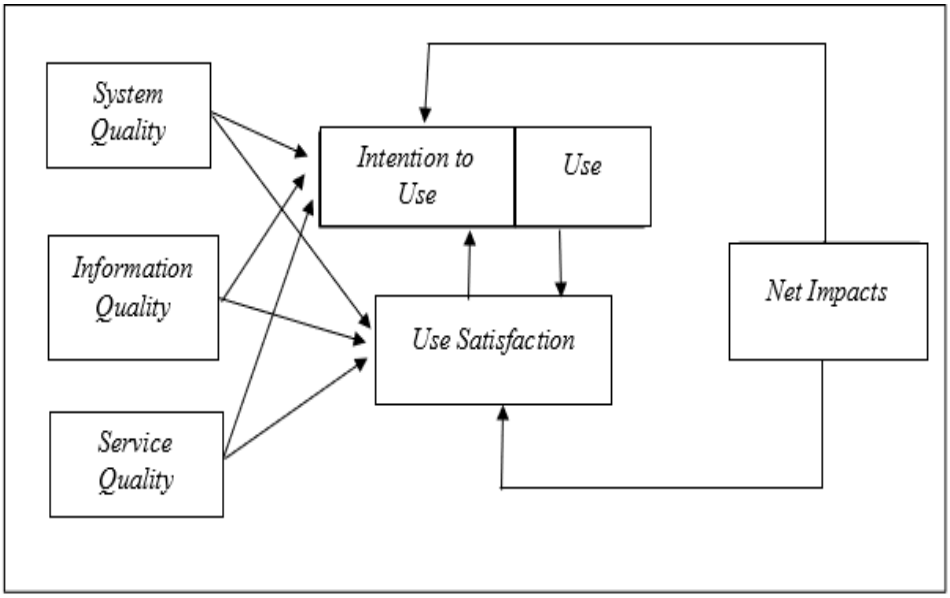

Figure 1. Model of Information Systems Success, De Lone & McLean 2003

The model in figure 1 shows that a system can contribute to providing information to individuals or companies that use the system in their daily operations. Ensuring that the output produced by the system can help the company is preparing a budget and make decisions for the progress of the company.

Research Methods

Type of research

This study uses a descriptive approach with quantitative methods. The data was collected using questionnaires distributed to PT Farmasi employees, in addition to questionnaires conducted interviews with several ERP users in the company.

Research focus

This study aims to determine the effectiveness of the implementation of the ERP application system for raw material inventory at PT Pharmacy. The ERP application is used by the user to ensure the availability of information and control the company's raw material inventory. Inventories owned by PT Pharmacy are numerous and of various types. Inventory owned is something that is very vulnerable. This is because the inventory at this company is materials that have chemicals for Pharmacy and each ingredient requires special treatment..

Population and Sample

The population in this study is employees of PT. Pharmaceuticals are engaged in manufacturing drugs, while the sample is employees who are directly related to ERP systems in the supply of raw materials.

Variable Operations

The effectiveness of ERP inventory implementation is operationalized as follows based on research conducted by Rohani and Siti (2018)

Table 1

Variable Operations

Variable Concept	Dimension	Indicators	Measurement Scale
System quality Characteristics of a system	1. Ease/speed of information systems 2. Information system security 3. User interaction with information systems	1. System reliability 2. Response time 3. Data integration 4. System settings 5. User requests 6. Adaptation 7. Language 8. Intuitive system	Interval Scale
Quality of information Information expected from a system	1. Accuracy of information 2. Physical evidence (Documentation)	1. Relevance 2. Easy to understand 3. Accuracy 4. Completeness 5. Uses 6. Up to date	Interval Scale
Quality of service Characteristics of support from it or managers to users	1. Information Technology Officer	1. Responsiveness 2. Empathy of IT staff 3. IT Trouble Shooting	Interval Scale
User satisfaction Satisfaction levels are measured by system quality, information quality, and service quality.	1. User expectations/ expectations	1. Satisfaction with the system 2. Satisfaction with the completeness of the information 3. Satisfaction with IT services	Interval Scale
Employee Performance It is the work of employees according to their responsibilities.	1. Qualitative 2. Quantitative	1. Work results	Interval Scale

Result

The description of respondents who answered the questionnaire showed the following things. The respondent's tenure at the company is between 2 to 20 years. 87% of respondents are graduates of S1 and the remaining 13% are D3 and S2 graduates. The questionnaire was distributed to five divisions within the company, including material planning, operational excellence, supply chain management, supply chain finance, and warehouse. Testing the validity and reliability of the variables shows that the measuring instrument used is valid and reliable.

The average value of the questionnaire results is classified in several levels as follows:

Table 2

Classification of average values

Classification of average values	
Ineffective	1,00 - 1,80
Less effective	1,81 - 2,60
Somewhat effective	2,61 - 3,40
Effective	3,41 - 4,20
Very effective	4,21 - 5,00

Here is a description of each dimension studied, namely system quality, information quality, service quality, user satisfaction, and employee performance.

Table 3

Results of Recapitulation of Respondents' Responses to System Quality

Results of Recapitulation of Respondents' Responses to System Quality			
No.	Indicators	Average	Information
1	System Reliability	4,53	Very effective
2	Response Time	4,50	Very effective
3	Data Integration	4,57	Very effective
4	System Settings	4,17	Effective
5	User Request	4,23	Very effective
6	Adaptation	3,83	Effective
7	Language	3,40	Somewhat effective
8	Intuitive system	4,03	Effective
	Average	4,16	Effective

Table 3 shows that the quality of ERP systems supplying raw materials in PT Farmasi companies is effective. This shows that when viewed from the quality of the ERP system, the raw material inventory is effective. Indicators of system reliability, response time, data integration, and user requests are included in the value classification very effectively. For system settings indicators, system adaptation and intuitiveness are included in the effective classification. As for language indicators only get somewhat effective values. This possibility occurs because ERP systems still use English and languages that cannot be understood by everyone. For the setting of the language, the company cannot do anything because all ERP system applications in Indonesia use the same language that has been provided by the licensee.

Table 4

Results of Recapitulation of Respondents' Responses to Information Quality

Results of Recapitulation of Respondents' Responses to Information Quality			
No.	Indicators	Average	Information
1	Relevance	4,23	Very effective
2	Easy to Understand	4,30	Very effective
3	Accuracy	4,40	Very effective
4	Completeness	4,27	Very effective
5	Uses	4,23	Very effective
6	Up to date	4,30	Very effective
	Average	**4,29**	Very effective

Table 4 shows the quality of raw material inventory information generated from ERP systems. All indicators related to the quality of information are included in the classification of very high values. This explains that the ERP system already provides inventory information according to the needs of the company.

Table 5

Results of Recapitulation of Respondents' Responses to Information Quality

Results of Recapitulation of Respondents' Responses to Service Quality			
No.	Indicators	Average	Information
1	Responsiveness	4,27	Very effective
2	It Staff Empathy	3,23	Somewhat effective
3	IT Trouble Shooting	4,07	Effective
	Average	**3,86**	**Effective**

Table 5 shows that the responsiveness of IT parties in dealing with problems faced by users is already effective. This is evidenced by the results of respondents who showed very effective value. Related to troubleshooting, users consider it to be good in finding problems and thinking about solutions to the problem. As for the empathy indicators IT staff only get somewhat effective grades. According to respondents, it still lacks empathy for the problem of monitoring raw material supplies using ERP systems. This happens because it can not only focus on supervising the ERP system inventory, but it must ensure the entire ERP system runs effectively and efficiently.

Table 6

Results of Recapitulation of RespondentsResponses to User Satisfaction

Results of Recapitulation of Respondents' Responses to User Satisfaction			
No.	Indicators	Average	Information
1	Satisfaction with system quality	4,23	Very Effective
2	Satisfaction with information completeness	3,73	Effective
3	Satisfaction with IT Staff Services	3,20	Somewhat Effective
	Average	**3,72**	**Effective**

User satisfaction measurements are based on system quality, information completeness, and quality of service. In table 6, users are shown to be satisfied with the ERP system performance of raw material inventory. Users feel very satisfied with the quality of the system, the completeness of information on raw material inventory provided by the ERP system is effective and is according to the user needs. Indicators of satisfaction with IT staff services are considered sufficient by users. Overall users are satisfied with the current performance of ERP systems. According to the ERP, system users have helped users in managing and getting information related to the company's raw material inventory.

Table 7

Results of Recapitulation of Respondents' Responses to Employee Performance

Results of Recapitulation of Respondents' Responses to Employee Performance			
No.	Indicators	Average	Information
1	Performance Results	4,80	Very effective

Table 7 shows that current ERP systems have helped employees perform in supervising raw material supplies. The information provided by ERP systems is very helpful for employees in managing raw material supplies. In addition, the output of the ERP system can help employees know the nominal supply of raw materials and provide data to prepare a budget for inventory needs.

Table 8

Recapitulation of Respondents Responses

No.	Dimensions	Score average	Description
1	System quality	4,16	Effective
2	Information quality	4,29	Very effective
3	Service quality	3,86	Effective
4	User satisfaction	3,72	Effective
5	Employee performance	4.80	Very effective
	Total average	4,17	Effective

The results of the interview also found that the implementation of ERP system supplies raw materials is effective but there is still a deficiency in the language used ERP system that slightly hampers the learning process. The quality of information is considered by respondents to be very effective, according to the questionnaire answers. The quality of service is good, there is only a lack of empathy from IT staff related to inventory-focused ERP issues.

Discussion

The results showed that the ERP system of raw material supply in pharmaceutical companies in Bandung city has been effective, even two dimensions namely the quality of information and employee performance have shown very effectively. ERP systems can already help users in carrying out their work responsibilities. This is following [15] which explains that a system must have unity even though it consists of several components. A good system should be able to run input mechanisms, processes, and outputs according to the user's needs.

Service quality is largely considered effective by respondents, except for its staff's empathy for the problem of raw material inventory in ERP systems. IT staff can't do much because they can't just focus on the problem of inventorying raw materials on

ERP systems. IT staff must ensure that all ERP systems run effectively and efficiently, cannot focus on one thing only, namely inventory, therefore the company should increase the number of IT staff who focus on the inventory section given the importance of raw material suppliers so that there is no buildup of raw materials or absolute and can support the smooth production process.

All respondents consider the ERP system that is running today to reach an effective level for the management of raw material supplies. This means that the ERP system must be improved until it reaches a very effective level. Improvements are made especially for the quality of the system and the quality of its services by providing guidance that is easily understood both in English and Indonesian, as well as providing training for the IT section by emphasizing that the service part must be able to provide satisfaction to the internal customer because the internal customer who is satisfied will eventually be able to provide satisfaction to the external customer.

Conclusion

The results of the study found that the ERP system supplies raw materials showed at an effective level. Dimension system quality, service quality, and customer satisfaction show effective levels, while dimensions quality information and employee performance show very effective levels. From the results of the interview, it was also found that the implementation of ERP system supplies of raw materials is effective, but there are still shortcomings in the language used ERP system, which slightly hampers the learning process. It was also found that there was a lack of empathy from IT staff related to ERP problems that focused on inventory.

Suggestion

The results of the study found some weaknesses, especially in the dimension system quality, service quality, and user satisfaction. For these weaknesses to be overcome, the company should provide ERP system training trainers to users so that users can follow the development of the system. Create a guide with language that is easy to understand. In addition, the company should also provide training for IT staff continuously so that every problem that occurs can be overcome quickly and follow the needs of users. IT staff should also be given the understanding that the service section should provide services well by service quality indicators.

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