

Modelling Operation of Logistics Management in Modern Market: A Case Study in Indonesian Retail Company

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Abstract. Logistics management holds an important role for every company include product procurement, product storage, and product distribution. Rapid technology development is insisting the company to use all of its resources maximally and professionally to support their success. Implementation of logistics management can be seen in the retail company. Design of the logistical management operation model, using the System Development Life Cycle (SDLC), needs to be done for better implementation. The needs for design are identified by using system request and feasibility analysis that will be able to reduce non-value added time in the order picking process and able to simplify the company's logistics activity. The system entity is analyzed and shows the affecting factors are: input, process, output, objectives, stakeholder, resources, internal control, operating constraint, opportunities, and threats. Then, the conceptual model of the logistics management model is built through the application of value chain analysis and the application of the canvas operating model. At the new warehouse location, a warehouse management system will be implemented and built collaboration with several fast-moving consumer goods (FMCG) suppliers. Then Business Process Modelling Notation (BPMN) is used to model logistics business processes, inbound logistics business processes, inventory management business processes, and outbound logistics business processes. The business process model will be used as a reference for the company to carry out its logistics business operation.

1. Introduction

Logistics activities as part of the supply chain are very important for a company, both from the procurement of products, product storage, to the process of distributing these products [1]. The existence of good and adequate logistics greatly determines the smooth implementation of operational activities and administrative activities within a company. Logistics management in certain companies is affected by technological developments. All logistics activities must be adapted to existing technology, the more modern the technology, companies will be able to improve their logistics activities to be better than before [2].

Application of logistics management can be seen in trading or retail company. The retail concept was developed recently but has faced a tough challenge due to several factors such as the implementation of modern IT infrastructure, ERP availability, and logistics management [3]. Research on modern market logistics management has been carried out before by several researchers regarding logistics management with qualitative descriptions in Giant Ekstra [1] and logistics distribution systems at



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Indomaret stores in Semarang City [4]. System Analysis and Design is an approach used to analyze, design, and implement improvements to support ongoing business. One systematic approach to implementing system analysis and design is the System Development Life Cycle (SDLC) [5]. System Development Life Cycle (SDLC) is a method for developing systems that are commonly used by companies, where the System Development Life Cycle (SDLC) consists of several phases [6]. Designing a system using a system development life cycle (SDLC) can be done through four main phases, namely planning, analysis, design, and implementation [7]. Where each of the main phases uses a particular method to complete the objectives to be achieved.

This research was conducted in a new company which is one of the retail company engaged in selling fast-moving consumer goods (FMCG) and based in Jakarta. They are planning to develop their business to the entire of Indonesia, and one of them is to expand the business in Bandung. For this development demand, this company needs a warehouse to facilitate business activities in Bandung. At present, the company still has problems in managing their logistics. So, it is necessary to design an operating model of modern market logistics management that has never been done before in this company.

2. Materials and Method

Steps that are taken in this research are:

2.1. Identifying system requirements

In this step, planning and analysis of the causes of the need to design a modern market logistics management operation model are done by using a system request and feasibility analysis that are useful to determine the usefulness of the design and the risks that can occur along with the design [7].

2.2. Analyzing system

In this step, analysis of needs for the modern market logistics management system is carried out by using an Analytical System Entity which considers several factors such as [8]

- a. Input
- b. Process
- c. Output
- d. Objectives
- e. Stakeholder
- f. Resources
- g. Internal control
- h. Operating constraint
- i. Opportunities
- j. Threats

2.3. Designing model

In this step, the design of the operation model of modern market logistics management is done by using

- a. Value Chain Analysis, which discusses primary activities and support activities contained in the company to support the smoothness of company operations [9].

- b. Operating Model Canvas, which discusses several aspects such as Process, Organization, Location, Supplier, and Management owned by the company in carrying out its business activities [10].

2.4. Analyzing business process

In this step, description or compilation of business process which contained in the operation model of modern market logistics management is done using Business Process Modeling Notation (BPMN) in business process, including [11-12]

- a. Logistics process
- b. Inbound logistics process
- c. Inventory management process
- d. Outbound logistics process

3. Results and Discussions

3.1. Analysis of System Need

The need for a modern market logistics management system is identified using System Request and Feasibility Analysis. System Request approach is used to explain the reasons and value-added in terms of business that will be obtained from designing a modern market logistics management system. Several elements in this approach are sponsor project, business needs, business requirements, business values, and special issues/ constraints to clarify its usefulness. The Feasibility Analysis approach is used to identify the risks that will be faced while designing the system, including technical feasibility which related to the feasibility/ technical readiness and organizational feasibility which related to the feasibility/ system readiness to be accepted by the company.

The Project Plan produced from the use of system request and feasibility analysis can be seen in Table 1. In the Project Plan, it can be seen that the design of the modern market logistics management operation model has several benefits for the company including facilitating inbound logistics, inventory management, and outbound logistics activities. The challenge that the company facing to run the logistics management operation model is the lack of a warehouse operator who has experience with the new information system that will be implemented in the warehouse. Therefore, it is necessary to conduct training related to the application of that information system in the future.

Table 1. Modern Market Logistics Management Operation Model's Project Plan

PROJECT PLAN	
System Request – Operation Model Modern Market Logistics Management	
<i>Business Need</i>	The company has a problem with managing their logistics. So this project was proposed to improve business processes and design an operating model for managing modern market logistics
<i>Business Requirements</i>	
The Operation model of modern market logistics management can be a basic reference for the company so that it can manage all business processes that are related to or involved in logistics. The specific functions of the modern market logistics management operating model are:	
<ol style="list-style-type: none"> 1. Create and store the product master of all products that are in the warehouse 2. Finding the amount of product stock in the warehouse 3. Search for product locations in the warehouse 4. Track the status of the product based on the process being passed (eg delivered, out form warehouse, etc.) 	
<i>Business Value</i>	
<ol style="list-style-type: none"> 1. Reducing nonvalue-added time when searching product 2. Simplify inbound logistics activities 3. Simplify outbound logistics activities 4. Simplify inventory management activities 	
<i>Special Issues / Constraints</i>	
<ol style="list-style-type: none"> 1. Due to the use of modern warehouse management system, the expert workforce is required to understand and operate the technology 2. Due to business expansion into new areas, the infrastructure owned is still limited 3. The system design must be applicable in November 2018 	
Project Summary–Operation Model Modern Market Logistics Management	
Feasibility analysis is made for the operation model modern market management logistics's project. The feasibility analysis carried out is as follows:	
<i>Technical Feasibility</i>	

1. Related to supporting system technical aspects
 - a. Some consultants can assist in Bandung
 - b. The warehouse management system can be accessed via web
 - c. The warehouse operator has no experience or knowledge regarding the use of a new warehouse management system
2. Related to project size
 - a. The project team consists of 6 people
 - b. The model is designed to be implemented at the company's location in Bandung
 - c. The model designed must be applicable in November 2018
2. Related to compatibility

The modern market logistics management model designed is an improvement of the logistics management system that has been applied before, so it is necessary to adjust to the new work environment

Organizational Feasibility

1. Related to project champion

The company has a high interest in designing this system because it has sufficient scientific background regarding logistics as the basis for system design
2. Related to organizational management

The company's management know that they still have a logistics management problem, therefore the existence of this design is expected to improve and resolve these problems
3. Related to system users

In this case, a system user who is a warehouse administrator will feel helped by a system that can help the management process in the warehouse

3.2. Analysis of System Entity

Result of the analytical system entity application will produce factors that are system entities as shown in Figure 1. Based on Figure 1, it can be seen that in the implementation of the modern market logistics management system is influenced by several factors such as objectives, resources, opportunities, threats, internal control, stakeholders, etc. Classification between acceptable input, unacceptable input, acceptable output, and unacceptable output are also an important thing to do, so the company can determine how the input and output that should be allowed for the company.

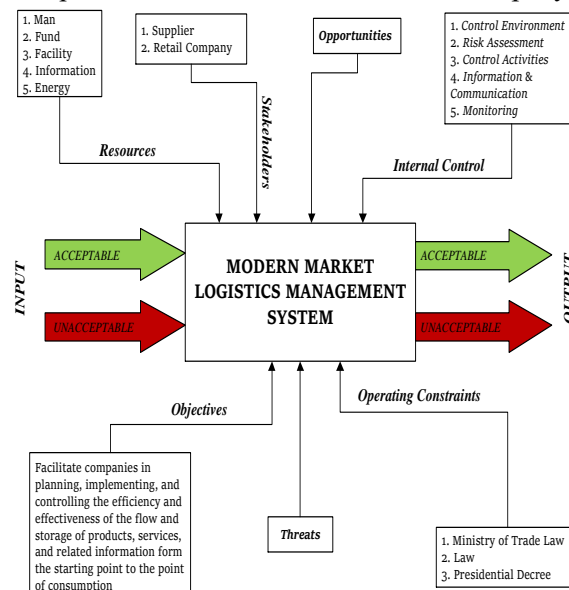


Fig. 1. Modern Market Logistics Management Analytical System Entity

3.3. Analysis of Model Design

Design results of modern market logistics management operation model using value chain analysis and operating model canvas producing constituent elements that make up the conceptual model as shown in Figure 2. Based on the conceptual model of the modern market logistics management operations, it can be seen that the process that occurs is the procurement submit Purchase Order (PO) list to suppliers, after obtaining confirmation regarding the availability of related products, the procurement will provide information for carrying out inbound logistics to the warehouse, which include receiving process, counting & quality check, and put away activity. And then, the product according to the Purchase Order (PO) list will be sent by the supplier. The next process is the initiation of inventory replenishment from the retail side by submitting a list of Product Request (PR) to the warehouse to be fulfilled by the warehouse in the form of product delivery (outbound logistics with activities such as order picking, dispatch, and delivery) according to the list. In the warehouse itself, inventory management takes the form of a stock take and cycle count which indicates the management of inventory contained in the warehouse [13-14].

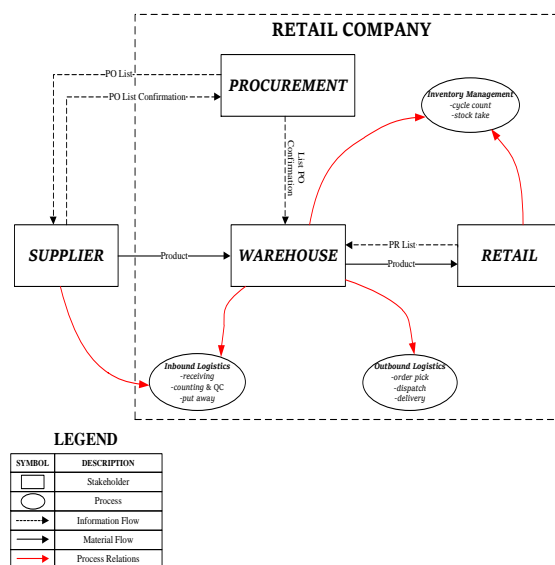


Fig. 2. Conceptual Model Design

3.4. Analysis of Business Process

The company's modern market logistics business process after designed is shown in Figure 3, where each business sub-process has integrated its logistics operations with information systems to facilitate the flow of information both with internal and with business partners. In this research, because the perspective used is based on the retail company, so the modeling of the interaction process between business partners and business units is shown between procurement and suppliers, suppliers and warehouses, and between retail and warehouses.

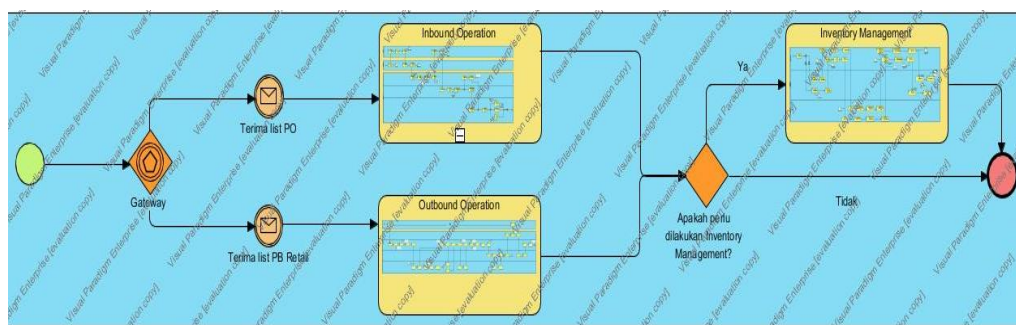


Fig. 3. Business Process Modelling Notation of Overall Logistics Process

3.5. Discussion

Modern market logistics management operation model designed based on the research methodology is expected to be a reference for retail companies, in general, to be able to carry out their company's logistics activities. For the sake of smooth logistics activities in accordance with the design of the operation model, companies need to prepare themselves in several ways, especially in the company's readiness from a technical and organizational perspective, such as the need for experts to operate modern technology that will be applied by the company and the availability of modern technology will simplify the company logistics activities to improve the effectiveness and efficiency of the company in the face of competition.

4. Conclusions

Conclusions obtained from this research are: 1) The company needs identification that conducted produces a Project Plan document that discusses the cause of the need for a company to design a modern market logistics management operation model through several parameters such as project sponsor, business needs, business requirements, business values, special issues/ constraints, technical feasibility, and organizational feasibility; 2) Analysis of modern market logistics management system entity carried out by analytical system entity produces factors such as acceptable input, unacceptable input, process, sub-process, acceptable output, unacceptable output, objectives, stakeholders, resources, internal control, operating constraints, opportunities and threats that are interconnected and affect the course of the modern market logistics management system; 3) Result of value chain analysis and operating model canvas are used to design a conceptual model of an operating model that shows the relationship between each stakeholder, the process that occurs, and the information flow that occurs between each stakeholder; 4) Business processes contained in the modern market logistics management operation model are modeled using Business Process Modeling Notation (BPMN). The modeled process are logistics business process, inbound logistics business process, inventory management business process, and outbound logistics business process which are sub-processes of logistics business process. The application of BPMN can identify each activity, role, and flow contained in the business process.

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