Chapter 87
Pricing Based on Real-Time Analysis of Forklift Utilization Using RFID in Warehouse Management

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ABSTRACT

Radio frequency identification is an automatic identification technology that is used in various applications. Despite the many academic and theoretical studies that have been conducted about this technology, only a few of these studies have concentrated on application problems in real life. Therefore, many of these theoretical studies cannot be of help to practitioners directly. In this study, to realize such an objective, in order to price forklift operations used in handling operations in logistics warehouse management, a new approach that works with RFID technology is presented. The proposed model has been used in tracking of forklift movements at the warehouse of a firm active in the logistics sector and has been tested. The results obtained from the case study have shown that developed systems can be successfully used in price determination of forklift movements in warehouse management. Although the case was small, the proposed approach works well to follow real-time forklift movements and produces encouraging and meaningful outcomes.

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INTRODUCTION

For the purpose of meeting customer requirements logistics management is defined as the process of effective and efficient flow and storing, bringing under control and planning of movement of all kinds of product, service and information flow from starting point of the raw material to the final point of product's consumption in the supply chain (Cooper et al., 1997). The firms that are active in logistics field which has presently become a very important sector have been operating within difficult market conditions and intense competition environment. In order to maintain their existence under these conditions logistics firms must present their products and services to the market and their customers faster and in a more economical way than their competitors. In order to decrease supply time duration and provide fast response to demand changes that takes place in task durations in logistics, sector product information need to be obtained in real time. For this reason, firms need application techniques that decrease the costs and increase the efficiency and performance in logistics sector. Radio frequency Identification (RFID) is an automatic identification technology use of which has been gradually increasing in supply chain management.

Operations in logistics management are basically formed by the two processes; product and information mobility. When products are on the move which is during transportation, distribution and handling activities process product related information need to be rapidly identified and passed onto related departments, as well. The warehouses, which are used for product stocking in logistic, are places where product handling and physical movements are carried out intensively. Besides warehouse management is an important task in logistic from the point of bringing down the costs and reaching customer satisfaction. Today system control and management of warehouses that contain many products is difficult without having automatic identification. For example barcode technology that was started to be used in inventory controlling activities after 1990s has decreased erroneous and insufficient data entry that can take place due to human mistakes and allowed significant efficiency and performance increase. At present however, the RFID has superior advantages compared to barcode technology. So this technology allows for easily tracking of business processes, decreasing of labor costs and increasing of effectiveness of logistics and supply chain (Xiao et al., 2007).

This article aims at design and application of a tracking system with RFID in response to the problem of pricing of activities of forklifts used in handling operations in logistics warehouse management. The rest of the study has been organized as follows: In the second section basic definitions and general information for RFID have been briefly given. In the third section the literature review encompassing the studies about RFID has been presented. In the fourth section problems dealt with in the application have been identified. In the fifth section structure of the designed RFID system has been explained. In the case study, pricing of movements of forklifts via designed system has been explained by an example. In the fifth section results of the study have been given and useful findings that could be drawn from system have been identified. The study has been ended with the conclusion section.

BACKGROUND

RFID is an object identification technology that uses radio frequency without any help from a human. Although this technology was found out in 1950s its real development and application have been widely spread after 1990 (Roberts, 2006). Basically RFID system is made up of a microchip (tag) around which