

RFID 應用於物流中心之研究

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摘 要

在電子商務及跨國營運二大趨勢下，如何降低物流相關成本，並提升客戶服務的水準，是供應鏈管理重要的課題。通信資訊科技的應用被認為是達成上述目標的關鍵要素之一，其中無線電射頻識別技術（Radio Frequency Identification - RFID）已由行政院經濟部列於「台灣挑戰 2008 國家發展重點計畫」中，而美國之零售業龍頭 Wal-Mart 也列出要求合作之廠商逐步落實 RFID 技術的時間表，可見應用 RFID 技術的前瞻性與發展性。

物流中心（Distribution Center - DC）在供應鏈中居樞紐的地位，其所可能涵蓋的功能亦相當廣泛。尤其是以物流中心為基礎所衍生的第三方物流服務業（3rd Party Logistics Service Provider），為滿足現代物流『多樣少量之市場需求』、『縮短流通通路』及『降低流通成本』等目標，其營業範圍可能包含了將商品上游製造業者（或進口商）至下游零售商的絕大部分作業，如進貨接收、暫存、保管、包裝、流通加工、揀取、分類、出貨、配送、資訊處理等。

基於 RFID 技術的發展潛力，本研究認為其在物流中心的落實將有助於大幅提升台灣物流服務之水準與效率，因此選取了一國內大型第三方物流公司之物流中心進行個案研究。藉由個案物流中心作業流程之了解與歸納，以及歷史與現場資料之蒐集與分析，本研究利用電腦模擬軟體 ARENA 建立了個案公司現行作業之進、出貨模擬模型。之後，並依據個案物流中心現行作業之特性，以及 RFID 技術發展之現況，擬定 RFID 技術引進該物流中心之策略，並以電腦模擬與統計分析為工具，評估引進 RFID 技術之可行性。研究結果顯示 RFID 技術確實可改善現行作業流程之瓶頸，並提升個案物流中心的作業處理能量

引進 RFID 技術對物流中心之經營者是一項重大的決策，其牽涉高額的資本投資，以及許多管理原則與作業程序之調整。本研究透過模擬試驗，以及相關設備成本與潛在效益之量化，進行的成本效益分析，除可提供業界有力之決策輔助參考，並有助於相關決策風險的降低。

關鍵字：無線電射頻識別技術（RFID）、物流中心、模擬、成本效益分析

Evaluation of Radio Frequency Identification at Distribution Center

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Abstract

Under the trend of e-commerce and global operation, how to reduce the related logistic cost and upgrade the level of service has become the most important issue of supply chain management. The application of information and telecommunication technology is one of the critical factors in achieving above goal. Among them, RFID (RFID-Radio frequency Identification) is listed in the National Development Plan for Challenging Year 2008 by our government. Meanwhile, Wal-Mart, the largest retailer in American, has set the timetable for its suppliers to implement RFID. Therefore, the development of RFID cannot be overestimated.

The distribution center (DC), with a wide range of logistics functions, plays a center role in the supply chain. Particularly, to meet of the goals of supporting the customized markets, shortening the length of distribution, and lowering the cost of logistics operation, the third party logistics service provider offers the services covering almost all operations from the manufacturers to the consumers. For its customers, it can handle, for example, receiving, storage, re-manufacturing, picking, sorting, delivery, and information processing etc.

Due to the promising potential of RFID, it is believed that the implementation of RFID technology will greatly improve the level and efficiency of logistics operation in Taiwan. Therefore, a local large 3PL DC is selected as a case study for our research. By analyzing the processes and collecting the historical and current operational data, we build a simulation model by ARENA to simulate the inbound and outbound operations of the selected DC. In addition, based on the current operation of the selected DC and the characteristics of RFID, a possible scenario of introducing RFID is determined and further examined by computer simulation and statistics tools to evaluate the feasibility of RFID implementation. The results show that RFID technology can effectively improve the bottleneck of current operation and increase the capacity of the selected DC.

The introduction of RFID is a serious strategic decision, which involves high capital investment and significant policy/process changes. A cost-and-benefit analysis is performed based on the results of computer simulation and the assessment

of potential benefit and expenses. The conclusion of this study thus provides the decision maker a useful guideline with reduced risk.

Key Words: Radio Frequency Identification(RFID), Distribution Center, Simulation, Cost Benefit Analysis

