TURUN KAUPPAKORKEAKOULU
Turku School of Economics and Business Administration

ABSTRACT

X	Master´s thesis
	Licentiate´s thesis
	Doctor´s thesis

Subject	Logistics	Date	26.1.2005
Author(s)	Paavo Kettunen	Student number	
		Number of pages	89
Title	Comparing Manual and Automated Warehousing Functions in Paper Manufacturing		
Supervisor (s)	Ph.D. Olli-Pekka Hilmola and M.Sc. Lotta Häkkinen		

Abstract

Strong demand of paper in Asia and the growth in global economy have increased the capacity. The technological developments have increased the manufacturing efficiency, but simultaneously well centralized manufacturing operations have made distribution complex, and therefore warehousing efficiency has decreased.

The objective of the study is to describe and compare the functionality and systems of three different warehousing alternatives in paper industry. Due to the blurred nature of this evaluation in terms of both theory and practice, the case study approach was chosen as the research method.

The theoretical part of this thesis consists of the description of warehouse management information systems and different inventories of the supply chain. In the paper industry, the use of automation in the management of material flows has increased. Furthermore, new technologies, such as RFID, are increasingly utilized. Multiple factors affect the use of warehousing methods in different stages of the supply chain. In distribution, centralization is the common strategy.

In the empirical part of this thesis, the paper manufacturing process is overviewed. The extensive range of end products in paper manufacturing inflicts problems in production as well as in distribution. The study also includes an analysis of the financial statements of North Europe's five largest paper manufacturers from the years 1999-2003. The purpose of the analysis is to view the stage of the industry's investment cycle. From the analysis, it can be seen that the inventory turnover times are extremely long and they have further increased after the peak of the investment cycle in 2000. This deceleration of turnover times indicates that the next investment cycle will focus on the implementation of automation in the warehouse management.

The three warehouses were chosen on the basis of the warehousing method in use. Two of the warehouses represent automated solutions and one uses a traditional manual warehousing. The different cases are analyzed based on observation conducted in the three different warehouses. Also document analysis and semistructured interviews were used as supporting methods

A key finding of the study was the obvious need for further automation of processes in order to make the inventory handling in the paper industry more efficient. Automated warehouses are a good means to meet the increased requirements of paper manufacturing and therefore their implementation is believed to be increasing. Nevertheless, manual warehousing will not cease to exist as the diverse needs of customers will justify their use in the future as well.

Information flow management is a major success factor in efficient material handling. This has to be acknowledged also in warehouse management. The warehouse management systems form a focal part in the delivery of the warehouse management system software. The benefits gained by the systems, reduce the central problems of the paper industry.

Key words	Warehousing, Paper Industry, Automation, Information Systems
Further information	