Chapter 27

Picking with Impact:
Best Practices for the Quality Improvement and Cost Minimizing of Consignment in the Logistics of an International Manufacturer

Matthias Lederer
University of Erlangen, Germany

Ferdinand Niedermeier
University of Erlangen, Germany

Jan Hoppe
REHAU AG+Co, Germany

ABSTRACT

The picking process in warehouses is an important step in global supply chains because it causes significant costs and has a high impact on customer satisfaction. Especially manual systems may cause high costs and can generate many picking errors such as type and quantity failures. Using the example of consignment at an international manufacturer located in Switzerland, this contribution provides in-depth fundamentals on picking processes. The picking system, typical workflows of manual picking procedures and theoretical considerations of optimal picking quality are given. Using a quality cost as well as a process cost analysis and a cause and effect analysis, the picking process is investigated in this scenario. It turns out that the optimal picking quality is surpassed in the case, which requires a systematic process re-design in order to cut costs. Therefore exemplary technical, organizational and soft best practices are shortly presented. In the scenario a business and technical case of the introduction an innovative weighting system is described.

INTRODUCTION

The picking process is one of the central functions within the warehouse logistics (Rammelmeier, Galka, & Günthner, 2012). However, in many companies this process generates most of the labor and operating costs (Goetschalkx, & Ashayeri, 1989). According to a recent study, the proportion of the cost of picking, meaning the gathering and bundling of items related to one order, is about 50% of the overall costs within logistics centers (de Koster, Le-Duc, & Roodbergen, 2007). In addition, the accuracy of picked

orders has a strong impact on the customer satisfaction (Taljanovic, Salihbegovic, & Pandzo, 2012; Boysen et al., 2015). Therefore, the optimization of the picking process influences the overall success of a supply chain as well as of a logistics center (de Koster, Le-Duc, & Roodbergen, 2007; Liu, 2007). Although the re-design of picking and packaging processes is a complex management task, applications and studies in different domains can show the optimization potential in this specific step of SCM value chains (Hellström, & Saghir, 2007).

Despite the high importance of the picking workflow, so far no sufficient effort has been made in the scenario of an international manufacturer[1], which serves as illustrative case study for this chapter. By now a variety of efforts have been made to optimize for example the stock placement strategies, the tracking and tracing of truck suppliers as well as the integration of vendors in order to holistically optimize the SCM. Simultaneously, the picking process needed to be analyzed and re-designed due to high labor costs. This chapter will outline the specific value of picking processes within international supply chains based on the case study of a global manufacturer. First, basic theoretical foundations on picking systems are made. Then, the case study shows how to analyze and improve the efficiency of the picking process using technical, process-oriented, and soft optimization initiatives.

Theoretical Foundation

The picking process has the general target to arrange subsets of goods (e.g., of a packet) based on requests (e.g., orders) from a total amount of goods (e.g., an assortment). Picking is becoming an increasingly important part of SCM because it realizes the almost last stage before the visibility line of the customer. Furthermore, picking also has a direct impact on later SCM stages which are visible for the customer such as the process step which provides suitable packing and delivery documents. In addition, the sub-step of SCM combines all previous data of the customer and his/her request to be processed. In particular, the modern age in which more and more items for end-consumer are ordered via modern information technology (e.g., via Internet) requires new solutions in picking as an integral part of SCM.

Picking System

Figure 1 outlines the necessary flows enabling the picking process (VDI, 1994):

Figure 1. Flows in a picking system
Own illustration adopted from Lolling (2003)
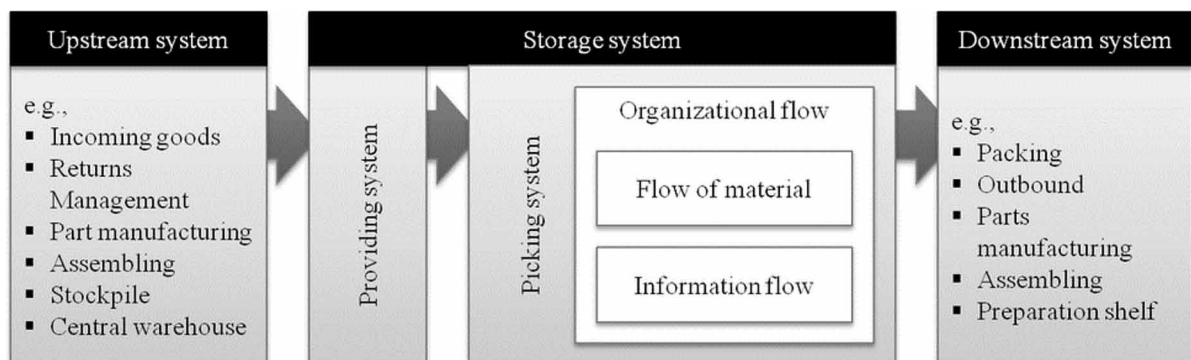
Related Content

Security Issues for ISO 18000-6 Type C RFID: Identification and Solutions

Peter J. Hawrylak, John Haleand Mauricio Papa (2013). *Supply Chain Management: Concepts, Methodologies, Tools, and Applications (pp. 1565-1581).*

www.irma-international.org/chapter/security-issues-iso-18000-type/73417

Optimization-Simulation for Maritime Containers Transfer

Abderaouf Benghalia, Mustapha Oudani, Jaouad Boukachour, Dalila Boudebousand Ahmed El Hilali Alaoui (2014). *International Journal of Applied Logistics (pp. 50-61).*

www.irma-international.org/article/optimization-simulation-for-maritime-containers-transfer/121752

Information Transfer

Manjunath Ramachandra (2010). *Web-Based Supply Chain Management and Digital Signal Processing: Methods for Effective Information Administration and Transmission (pp. 247-261).*

www.irma-international.org/chapter/information-transfer/37618

China's Environmental Issues, a Domestic Challenge with Regional and International Implications

Christian Ploberger (2013). *International Journal of Applied Logistics (pp. 47-61).*

www.irma-international.org/article/chinas-environmental-issues-a-domestic-challenge-with-regional-and-international-implications/83467

Information Quality in Supply Chain Software

Farhad Kafiand Majid Kafi (2016). *Handbook of Research on Global Supply Chain Management (pp. 105-126).*

www.irma-international.org/chapter/information-quality-in-supply-chain-software/141138