



Position paper

Roadmap to tracking based business and intelligent products

Jan Holmström^a, Risto Kajosaari^a, Kary Främling^{a,*}, Erik Langius^b^a Helsinki University of Technology, Otakaari 1, 02150 Espoo, Finland^b TNO ICT, Eemgolaan 3, 9701 BK Groningen, The Netherlands

ARTICLE INFO

Article history:

Available online 21 January 2009

Keywords:

Track and trace

RFID

Item-centric tracking

Supply chain management

Asset management

ABSTRACT

Item-centric tracking is an opportunity to increase visibility and control in different operations of a company. The economical feasibility of item-centric tracking is based on recent technological developments for monitoring the material flow on the item-level instead of the material type-level. It enables companies to track and trace assets over their lifecycle and manage supply chain operations across organizational boundaries. However, the challenge in practice is to find the right areas to start the development of business applications. In this viewpoint paper a means-ends framework for introducing item-centric tracking in business is proposed based on realized track and trace cases. Based on the framework a roadmap for introducing tracking in businesses operations is outlined. The proposed roadmap circumvents the most challenging business cases for introducing tracking and RFID-technology in the supply chain and focuses on asset management as a more accessible route for business.

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1. Introduction

Item-centric supply chain management [1] and item-centric control and information management [2] is an approach that offers companies opportunities to better track and trace assets over their lifecycle and to manage their supply chain operations efficiently across organizational boundaries. However, business scenarios for improved material and asset information management across the life-cycle and over organizational boundaries need to be further investigated in order to speed up the diffusion of the approach. Developing clear propositions is essential especially for diffusion of technology to small and medium sized enterprises.

This paper explores the business opportunities that result from shifting the focus of materials and asset management from location based control to item-centric materials and asset tracking [3]. The base principle [4] is to take the tracked item as the basic entity and treat the location as a property of the item. The result is that the item being tracked becomes the object of control instead of inventory and asset accounts in predefined locations. This way of shifting the locus of control to the product or item is a first step towards the intelligent product concept [5].

When in place, item-centric track and trace is a potential new means for companies to set up economically feasible concurrent enterprising solutions. The economical feasibility of item-centric tracking is based on recent technological developments in tech-

nologies for monitoring the material flow on the item-level instead of the material type-level. Tracking and automated identification are based on different types of bar codes and increasingly the use of radio frequency identification (RFID) technology [6].

To provide control over individual goods and assets it is necessary to develop technology that can maintain the identity of the item and that item properties, such as the location of the item, can be updated in the same way across locations (see Fig. 1). Item-centric supply chain management [3] focuses on the management of individual items instead of the material inventories at predefined locations. It is a proposed solution to the difficulty to develop value offerings over the life-cycle of items and across different enterprises in the supply chain. Fig. 1 illustrates the difference between a location based and item-centric approach to materials management.

There are many opportunities for businesses to benefit from item-centric control. The purpose of this paper is to identify state-of-the-art practices in item-centric supply chain management (SCM) and asset management (AM). Furthermore, we will analyse the identified applications and highlight the functional analogies between different types of applications. Based on the analysis we propose a roadmap for adopting item-centric control in different types of business applications.

2. Research approach

The roadmap for introducing the item-centric control in business, i.e. of tracking based business, is based on a number of state-of-the-art examples that have been presented in professional and academic journals in 2005 and 2006. The state-of-the-art cases were found using the Proquest en EBSCO databases. The

* Corresponding author.

E-mail addresses: jan.holmstrom@tkk.fi (J. Holmström), risto.kajosaari@tkk.fi (R. Kajosaari), kary.framling@tkk.fi (K. Främling), erik.langius@tno.nl (E. Langius).

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