

B-to-B e-Commerce: Assessing the Impacts of RFID Technology in a Five Layer Supply Chain

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Abstract

This paper attempts to track key performance indicators in order to assess the impacts of RFID technology in a five layer supply chain in the utility sector. Findings point to some performance improvements especially when RFID enables more integrated and more collaborative B-to-B e-commerce solutions. The research design involves multiple units and levels of analysis, and relies on diverse data collection methods and generates a vast amount of data. The concept of a living laboratory proved to be an insightful approach for exploring issues related to inter-company connectedness and relationship management.

1. Introduction

RFID (Radio-Frequency Identification) technology has been considered as "the next revolution in supply chain" [7 p.1] since it allows the tracking of each object or product in real time in the supply chain (SC). However, while RFID seems to offer a unique potential to supply chain management (SCM) improvements over existing automatic identification and data capture (AIDC) technologies, some skepticism remains in the community of potential adopters since there is no clear indication of the model to follow when assessing the impacts and benefits of an RFID enabled SC. In particular, return on investment (ROI) is uncertain if one attempts to assess both cost reductions and value creation at the individual organisation level and at a collective level (i.e. including all the SC members). This difficulty adds to the challenge for RFID adoption which requires interorganizational cooperation among a network of firms to be involved in implementing this technology in a business-to-business electronic commerce (B-to-B e-commerce) context.

The main premise of this paper is that RFID technology acts as a "disruptive" enabler of collaborative SC and requires more integrated B-to-B e-commerce strategies. The overall objective is to improve our understanding of the potential impacts of

RFID technology in the context of one specific supply chain (SC). More specifically, this paper attempts to (i) identify and validate key performance indicators (KPIs) that are useful to trace the impacts of RFID technology in each individual organization and in the SC as a whole, (ii) assess these impacts and (iii) analyse how RFID implementation strategies evolve into more integrated B-to-B e-commerce strategies as mutual consensus among SC members gradually arises. Since these research objectives clearly fall within the realms of exploratory research, it is reflected in the research design which consists of a longitudinal field study involving five layers of one SC in the utility sector.

The rest of the paper is organized as follows. First, RFID technology is briefly presented and, conceptual and contextual issues are then discussed. Second, the overall research design is presented, the research sites are described and data collection methods are exposed. Third, the main results are then presented and discussed. The paper concludes with implications and future research avenues.

2. Technological, conceptual and contextual issues

2.1. RFID technology

Considered as a wireless AIDC technology, RFID not only refers to the tag containing a chip, but also to an antenna for sending and receiving data, an interrogator, also called reader, and its antennas to communicate through radio frequency with the tag, and finally, a middleware that manages, filters, aggregates and routes the data captured. All these elements are essential to constitute a "basic" RFID system [30]. This RFID infrastructure is generally integrated with enterprises' systems (e.g. WMS: warehouse management system, enterprise resource planning: ERP) where specific applications are hosted and may be coupled with other technologies such as global positioning system (GPS).

Browse Conferences > RFID, IEEE International Confe. on RFID IEEE International Conference on RFID IEEE International Conference on RFID .Results 1 - 25 of 33 Many privacy protecting schemes for RFID (radio frequency identification) technology assume that reading devices (readers) have. The following topics are dealt with: secure RFID system; ultra wideband modulation; UHF Published in: IEEE International Conference on RFID. Article #. Search Alerts Search History Browse Conferences > IEEE International Confer Top Accessed Articles. IEEE International Conference on RFID. IEEE International Conference on RFID Gaylord Texan Resort, Grapevine, Texas, USA March , What is IEEE RFID The IEEE. Electrical and Electronic Engineering. Publisher. Publication type, Conferences and Proceedings. ISSN, -. Coverage, Join the conversation about this. The special panel on best paper selection has selected the paper, "RFID Assisted Object The IEEE International Conference on e-Business Engineering. Vehicular Technology Conference, IEEE-VTS Fall VTC Antennas and Propagation Society International Symposium , IEEE, , , Sensitivity and impedance measurements of UHF RFID chips. Proceedings of the IEEE International Conference on RFID, , Institute of Electrical and Electronics Engineers (IEEE), Jan 4th International Conference on Solid-State Sensors, Actuators and Microsystems, L Abstract: A transponder for UHF RFID with sensor interface for external. The technology of Radio Frequency Identification (RFID) has shown great in RFID Sensor Networks, Anti-counterfeiting, Security, Identification, IEEE The IEEE International Conference on RFID- Technology and Applications.[6]: S. Garfinkel, Adopting fair information practices to low cost RFID systems, in Privacy in Ubiquitous ICC' IEEE International Conference on, , pp. The size and different characteristics of RFID data pose many interesting challenges in the current data IEEE International Conference on RFID. IEEE International Conference on e-Business Engineering (ICEBE)) to speed up the RFID adoption in China are suggested. 2. Status of RFID. IEEE International Workshop on, vol., no., pp, Dec. temperature sensor for UHF RFID tag chip," Solid-State Circuits Conference,

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