A STUDY ON THE IMPACT OF WIRELESS PRODUCT IDENTIFICATION IN SUPPLY CHAIN MANAGEMENT

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ABSTRACT

Much sophisticated demand chains of customer and e-business pose new challenges to SCM. The sizes of delivery develop as an outcome of much delivery directly to use point. Customers are requesting deliveries and products customized to their particular requirements. Also the data concerning little customized deliveries has to be shared in volatile networks of supply. This article examines the wireless product identification technique opportunities in changing SCM. A new item level concept SCM and enhancing steps to accomplish the advantages are suggested. Innovative firms already utilize identification of wireless product with huge advantages in particular areas of function. The largest importance is in wide solutions of supply chain that is item level SCM.

Keywords: Wireless technology, SCM, E-commerce, Material handling, Product information

Introduction:

The requirement to present much valuable service for customers and similarly to reduce the delivery process cost is the most critical issue in SCM (Christopher, 1992). Organizations acquiring new solutions of SCM that develop value added to customers at reduced cost will rapidly be capable to develop their competitive benefit. Nowadays identification of wireless product that is the capability to recognize a product or part without physical handling automatically is becoming the foundation for such new solutions accurately in SCM. The purpose of this study is to describe the causes for utilizing identification wireless product in SCM and give present applications of supply chain using identification of wireless product. The first part of the study generates the SCM challenges that are making utilization of identification of wireless product interesting for firms. The second part establishes the item level concept SCM and the technique namely RFID (radio frequency identification) that enhances it. In the third section present wireless item
identification applications are presented and in the last part of advantages of constructing SCM applications are summarized.

Why solutions of wireless supply chain?

Before moving on to arguing what this new technique is and what are the new solutions of supply chain the author discusses about the drawbacks organizations are facing nowadays. The challenge becomes formidable rapidly when there is a requirement to customize both the product and delivery service (Fuller et al, 1993’; Smaros et al, 2000). The needs on SCM are greater when someone demands a car designed to her or his accurate requirements that is to be delivered to particular place preferred by customer. The seller has to handle the car separately through distribution and production until the last address of delivery is attained without increase and delay in costs.

When configuring solutions of SCM the 1st leading challenge to overcome is effective and rapid management of distinguished flows of material. Integrated with the requirement to lower the levels of inventory for larger efficiency of cost the first leading challenge is to develop the velocity and differentiation in handling of material. The 2nd challenge of SCM that is associated from an identification view point is effective customization that is the capability to deliver and generate products efficiently that attain individual requirements of customer. To perform this organization must know what to perform with individual product of each other and perform effectively on little batches of deliveries or products (Suomi, 1992).

The 3rd leading challenge common to identification of product is to handle logistics and production flexibly and exactly across multi-firm networks. The issue derives from the criticality of sharing information specific to delivery between firms. When deliveries are moved across boundaries of organization there are numerous issues in matching the acquired data to physical delivery and in causing information and material flows. These issues are much serious in circumstances where
several deliveries are processed (Johnston and Yap, 1998). Furthermore the information sharing information develop when operations of logistics are outsourced. Organizing efficient ways to share data with partners of supply chain is one of the largest issues in logistic operations outsourcing. However outsourcing is essential in operations of supply chain because it develops scalability and flexibility (Gormley and Cameron, 1998). Also providers of third party logistics can always develop the supply chain operational efficiency (House and Stank, 2001). Both the handling and customization issues as well as information sharing issue can be resolved with identification of wireless product and item level SCM. Products are customized and handled in batches of an individual across boundaries of organization in multi-firm networks in item level SCM.

The basis for item level SCM is product identification. The foundation for item level SCM is item level identification. Item level SCM is feasible if each product has a recognition of its own and the product can be identified and data about it can be updated or read in complete supply chain effortlessly. In item level SCM the information of product is updateable and feasible anywhere where the product is, whether it is the assembly line or the end consumer home. The problem is how to perform this effectively. The most effective applications for item level SCM can be constructed with identification of wireless product. The challenge of being capable to generate customized products effectively at item level customization is simpler to solve when products can be recognized on individual level of product. The issues in operational information sharing is connected to customized small deliveries across boundaries of organization are resolved if entire data about managing a product is attached to product and met in an effortless way. Item level SCM is a solution to customization, information sharing and handling challenges. Greater handling efficiency can be accomplished if the requirement to manage the product to recognize it is removed. Wireless product identification techniques can be applied to
be capable to communicate with the product without physical contact. Most similarly utilized technology of wireless identification is based on tags of RFID. It can satisfy the needs of item level SCM with acceptable costs. Products can be effortlessly recognized because RFID tags do not need sight line to be read they can be read through materials of non-metals and around sixty tags can be read simultaneously (Jones, 1999; Boxall, 2000; Lindstrom, 2000). During processing the write/read ability of radio frequency identification tags enhances altering the product data. Other techniques that could be utilized are chips of Bluetooth for costly equipment and GPS (global positioning system) for big items such as containers.

To be capable to use effective customization products have to be recognized at individual level of product. Then it is feasible to handle items individually in entire supply chain parts. The product identity is stored in tag using the technology of radio frequency identification (Gould, 2000; Philips Semiconductors, 2000, Omron, 2000) which could be greater than enough to provide every separate product recognition of its own. Efficient sharing of information can be accomplished if execution data of supply chain is interacted with product in a machine readable means. When utilizing radio frequency identification technique the items control attributes can be stored in the memory of tag or it consists of reference to the address of network where the data about product is stored so the attributes of control are met everywhere where the product is (Ashton, 2000; Stebbins, 2000). The information of product is also met at all times when using the address of network after once viewing the product. Nowadays the radio frequency identification technique tags are attaining a feasible price level for a developing amount of SC (supply chain) application. Present applications of supply chain use identification of wireless product. Creative firms have been capable to develop their levels of service and lower price by changing their processes of business utilizing technologies of wireless identification. The essential point to mention is that the advantages are actual that wireless
solutions of SCM have accomplished notable advantages in leading supply chain stages that manufacturing, distribution, in sourcing, after sales, warehousing and retailing.

**Manufacturing and sourcing:**

Ford, QSC and Toyota products of audio have been capable to streamline manufacturing and sourcing using radio frequency identification. Ford has changed its system of parts replenishment between assembly line and areas of storage and Toyota has reduced delays of production through much effective receipt parts by evolving a new wireless method of Kanban. QSC has been capable to integrate mass production advantages and make to order with its smart equipped system of assembly. The solution parts replenishments has been made much efficient by utilizing radio frequency identification technique to make receipt of automatic goods as soon as the shipment appears to yard of factory in Toyota. The organization has been capable to lower the number of expensive disruptions of production and re-planning as shipments of incoming are registered automatically in production scheduling and management of yard systems. Ford has evolved a new method of wireless Kanban with Where Net a technique provider firm. The new process has made it feasible to move away from a solution where the sections had to be lessened on line of assembly to enclose the needs for a complete shift to a solution where it is feasible to push segments to line of assembly in real time according to real needs. Ford is attempting to leverage its comprehension of prospects of radio frequency identification technique and has evolved a joint venture with Where Net to promote the replenishment method of wireless Kanban (Burnell, 2000b). QSC products of audio has been capable to reduce lead time of manufacturing, develop throughput and move from an operative model of build to stock to model of build to order where the size of economic batch is a single unit. The organization utilizes radio frequency identification technique to direct and track WIP (work in progress) through the means which enhances it to optimize the
work in progress flow and use products during assembly if required (Feare, 2000). Toyota utilized radio frequency identification technique to automate receipt of goods and associate this to its system of production scheduling. Now Toyota knows what segments have appeared as soon as the shipment gets into the yard of plant. Ford utilizes identification of wireless product for much efficient parts inventory handling. When segments can be located exactly both in assembly line and inventory they can be replenished much rapidly. QSC move one step ahead and the organization also resolved the issue of customization by using the ability of product to undertake its own recognition. By utilizing identification technique of wireless product it has been capable to attach essential data to flow of material itself. The system of assembly acquires the data about what requirements to be performed with a specific product directly from the product itself.

**Distribution and warehousing:**

Automatic identification techniques mostly bar codes have been engaged long in developing operations of distribution and warehousing. However the bar codes utilization includes manual management which generates friction in flow of material. Either the bar codes packages or devices of reading are managed manually for code reading (Moore, 1999; Bylinksy, 2000). An identity of product that could be scrutinized over air yields advantages as flows of materials much expeditiously and reliably. The identification of wireless product has the importance to alter warehousing radically because products can be stored anywhere and moved as required and predicted in a moment’s perception. Where Net evaluates that the prospects to alter the way in which space of warehouse is assigned can save between 10 to 20% of space of warehouse (Johnson, 2000). The wireless product identification advantages in distribution and warehousing exist mostly from decreased management using systems in which transactions made to products are recorded automatically. This outcomes in a more friction free flow and much efficient where the product management and collection of information is the one and
similar activity. The capability to give the item a distinct recognition also makes it feasible to evolve more effective and new solutions to sort and re-direct shipments on the move in distribution.

After sales and retail:

Wireless product identification enhances automatic receipt of goods, rapid counts of inventory from shelves and leading reductions in costs of checkout in retailing. The technologies of wireless product identification make new models of customer service feasible for after sales. Particularly in the situation of business to business new solutions based on identification of wireless product can create notable advantages of after sales to customer. A solution to the issue is to acquire the ordering task away from store that is reloaded by consumption. A system of goods receipt that exactly and automatically adds incoming materials to maintenance of inventory book integrated with POS (point of sale) demand information, enhances new feasibly order less solutions of replenishment between supermarkets and distribution centers. This would decrease the situations of out of stock highly. There are issues with point of sales based systems of replenishment. The mistakes in readings of stock collect and the supplier never knows how much there is in the stock actually until the shelves inventory count is carried out. In order to evolve a robust VMI (vendor managed inventory) solution the supplier would have to know the customer inventory. If products could be recognized automatically at an item level, counts of inventory could be performed rapidly when required and utilized instead of commands. Another efficient way of carrying out the counts of shelf would be with hand held readers (Milner, 1999; Bushnell, 2000).

In electronic grocery retailing the identification of wireless product opens up new feasible offerings of value to customers in addition to simpler order assembly and much reliable delivery. If products can be recognized without managing in the home of customers the supplier could handle food supplies of customers without commands from customer. In other words vendor
management inventory could be established with groceries end consumer (Smaros and Homstrom, 2000). The new after sales services growth using identification of wireless product can provide considerable new advantages to customer. The identification of wireless product can develop management of assets and support technician’s maintenance. After the product is sold that is required to construct a portable maintenance DB is to detach a radio frequency tag then it is updated with every transaction of service. When the customer delivers the product for a repair the tag is read and customer’s identity information conducted repairs previously, what precautionary maintenance requirements to be carried out and who to bill is accomplished straightly from tag (Gould, 2000). On the whole the largest advantages in retailing exist from the capability to recognize products without requiring handling them manually. This enhances much effective methods as products visibility in backroom and in shelves is accomplished. Similarly the capability to make the count of inventory in electronic grocery customer’s households makes new feasible service models completely. New services of after sales can be evolved using the feasibility to recognize products at individual level of product and the wireless write and read abilities of tags. Worldwide attainable control attributes can be utilized to assist customer firms in handling their properties.

**Complete advantages of wireless SCM:**

The 3 leading challenges presented to SCM nowadays is evolving new solutions for a much effective management of lean flows of material, effective logistic services and products customization and sharing of information across limits of organization. The drivers behind these needs are much experienced demand chains of customers and e-business. The solution to these challenges is wireless SCM. By detaching a remotely legible tag to every product and the product can be given an identity of item level. Communicating with the product while on the entry without a requirement for any holding or management becomes feasible and the product attributes can be
made attainable worldwide over the web. However making item level SCM solutions perform across organizations restricts advantages could be accomplished (Stone and Hollier, 2000). The evaluations for 10s of billions of dollars of savings of cost in chains of supply have been given for vast spread acquisition of electronic packaging using radio frequency identification (Burnell, 2000a).

When evolving applications crossing through numerous supply chain forms the identifiers can be used properly and widespread utilization enhances supply chain visibility, decentralized control can be used in supply chain and new type of applications or services of customer can be evolved (David, 2000; Finkzeller, 1999; Toyryla, 1999). If the identification of wireless product usage cross through the complete supply chain functional advantages from new applications in sourcing, distribution, and manufacturing, after sales, retailing and warehousing can be realized with an investment in an individual single technique. Moving the concentration from functional to solutions of supply chain would lastly offer supply chain visibility and so develop supply chain’s control. This would enhance the much interaction about exchange of inventory with data (Magretta, 1998). The visibility of supply chain develops as automatic recognition of flow of material offers material flow information in varied supply chain segments (David, 2000).

There is a feasibility to rebuild infrastructure of information systems with identification of wireless product. Nowadays vendors, retailers and distributors all fight in making a centralized hub of database around which everybody is to construct their own solutions. The foundation for this fight disappears if the author utilizes a decentralized process. Then essential data control for processes of execution are associated to physical product (Finkzeller, 1999). The outcome is that this would make SC (supply chains) less relied on central DW and it would enhance rapid implementation of effective methods as the requirement to combine information system reduces. Taking a cross organization view is important for utilizing identification of
wireless product as the foundation for value creativity (Kim and Mauborgne, 1999). On an individual stage of supply chain identification of wireless chain in SCM conveys like usual developments in effectiveness of supply chain offered by new technique. But moving the concentration to customer or the customers consumer supports to perceive how identification of wireless product initiate to challenge the basis of both customer service, process control and SCM (Toyryla, 1999). If the products contain the materials information and guidelines to manage and disassemble them is detached to the products in machine readable form then they can be sorted and recycled effectively.

**Conclusion:**

In this study the author has presented the SCM challenges that make the utilization of identification of wireless product valuable for organizations. The author conferred the item level SCM concept and evaluated present applications of supply chain of identification of wireless product. Huge advantages have been accomplished with identification of wireless product but solutions that cross through numerous organizations in SC are still uncommon. As the study has tried to reveal there are clear advantages in broad solutions. One essential reason for lack of extensive solutions that cross through the complete SC has been scarcity of worldwide standard for radio frequency identification based solutions of supply chain. There are several proposals for standards waiting to be approved at the moment (Burnell, 2000c; Frontline Solutions, 2000). Also Savi Technique has developed a reading device based on web that is capable to perceive entire radio frequency identification tags in market (Gould, 2000). Another challenge of radio frequency identification technique is that though 10s of radio frequency identification tags can be read at similar time only a single tag at a time can be written and when reading numerous tags one cannot know which tag is read (Ackley, 2000). So in order to handle tags separately they have to be marked separately. Another reason is the requirement for infrastructure investments assisting new model of wireless operation.
There can be disagreements easily about the investments sharing in technique and the advantages acquired. This is often a critical problem to solve for investments where other organizations advantage as much as or greater than the organization making the investment. However present providers of service such as Chep and Savi are making beginning investments already and organizations utilizing these services pay to providers of service for the advantages enjoyed (Dierks, 2000; Kleijn, 2000). The arousal of extensive providers of service could make this reason of shared investments substantially simpler to solve. The technique to undertake item level SCM is accessible on the market. Present applications and the technique evolution have decreased the cost of identification of wireless product techniques to a reasonable level. Now the challenge is to construct wide solutions of supply chain and models of new service using the technique.

References:


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