IMPACT OF RADIO FREQUENCY IDENTIFICATION (RFID) ON SUPPLY CHAIN MANAGEMENT

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This project examines the role of Radio Frequency Identification (RFID) in supply chain management (SCM). RFID first used in World War II, enables items to transmit information about them. From its humble past, RFID has evolved into a major breakthrough technology that lets businesses keep track of their products right from the manufacturing stage until they have been passed onto the final consumer. A serial number is used for identification purpose. This serial number identifies the object and its information on a microchip attached to an antenna. This antenna enables the chip to transmit the product information to a reader for further processing.

An RFID system consists of a tag, which is made up of a microchip with an antenna and an interrogator or reader with an antenna. The reader sends out electromagnetic waves. The tag antenna is tuned to receive theses waves. A passive RFID tag draws power from field created by the reader and used it to power microchip circuits. The chip modulates the waves that the tag sends back to the reader and the reader converts the new waves into digital data (Faber, 2002). RFID technology comes in two varieties—active and passive. Passive tags rely on an outside power source to read the signal, while active tags have their own batteries. Because transponders transmit signals to a reader that notes their location, this technology is being adopted as a means of marking and tracking items throughout the supply chain.

The most common applications of RFID are tracking goods in the supply chain, high value tools and even in improving internal efficiencies in many manufacturing facilities. RFID can also lead to an automated checkout of an entire shopping cart, although such a concept is still many years into the future (Falkman, 2003). The use of radio frequency tags continues to grow as businesses have started to realize the potential benefits that RFID has to offer.

The major benefit of RFID is reduced stock-outs at the store, which may drive more sales. RFID helps determine the amount of inventory for a particular time as well as when a replenishment order for a product needs to be done. The second benefit of RFID is the labor savings from the automation of the receiving process. RFID allows the user to automate the collection of data plus gather the additional product information that can be stored in the EPC (Electronic Product Code) number. The third benefit of an RFID tag is that it can hold more data than a bar code, which allows the user to serialize every RFID tag to identify unique items. In essence, the RFID tag becomes a mini database that travels with the item. Finally, unlike the traditional bar code technology where only one item can be read/scanned, in case of RFID multiple items can be read simultaneously in an automated fashion.

An issue of concern is the cost implementing an RFID system. The label needed to tag an item would cost little more than a dollar each. Also involved is the cost of procuring RFID equipment which can run into thousands of dollars. Another region of concern is the limited capability of an RFID system to store and transmit data. However this is likely to be improved in the near future. (Faber, 2002). The other issue is that RFID may actually trigger the fast and efficient replenishment of products that customers don't actually want at full price (Rappold, 2003).