

Supply Chain Management Using Cloud Based RFID Technique

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Abstract— Cloud based RFID is becoming a popular area of research these days. However, no any research is there where cloud computing goes hand in hand with RFID uses. In this paper RFID is used as an important technique in cloud based supply chain management system. Main aim here is to find less expensive passive RFID in supply chain management using cloud based software infrastructure. This paper explains basic principles of RFID, basics of supply chain management and cloud based supply chain management. It tries to reduce the cost of supply chain management businesses using RFID and cloud based platform. Proposed architecture addresses the pain points of customers in supply chain management, optimizes the IT cost and accesses the information from anywhere in the world. This results in cost savings, efficiency gains and visibility in supply chain.

Keywords -Cloud computing, EPC, RFID, SCM, CRM.

I. INTRODUCTION

Key points of the discussion in this paper are RFID, basic SCM (supply chain management) and cloud hosted SCM. It tries to develop RFID based cloud supply chain management by implementing the proposed system. RFID enables acquisition of object without direct line of sight from transponders and readers. [2]

Successfully implementing the RFID application in logistics and SCM has its advantages like rationalization of inventory management. Here it stores the data in centralized cloud based repository. [1] Using RFID and cloud as a technologies has its own advantages in cost savings, efficiency and visibility in SCM.

II. BACKGROUND

A. BASICS OF CLOUD COMPUTING

Cloud computing is the standardized IT capability, such as software application, platform or infrastructure delivered via internet technologies in pay per use and self-service way.

Cloud has 3 basic parts. They are Infrastructure as a Service (IAAS), Software as a service (SAAS) and Platform as a service (PAAS). Many organizations want to develop their own software and system and invests a large amount for that. But when they adopt to the cloud based IT model it reduces their IT cost by up to 50%. [1]

For example in traditional IT model customers are required to buy server, operating system like Linux/ Windows, software products like SCM, CRM and install their own hardware, So, they need to spend a lot on human resources, enhancement of

software and all. But, with cloud based IT model customer just need to subscribe to required software services without managing own hardware, software and manpower. It gives power to the customers to choose and use what they want.

B. RFID system

RFID is a wireless technology using radio signals to identify tagged objects automatically and remotely. [2]

It consists of two or three components. If it's a two component system it contains a reader and transponder. In three components system it contains a reader, transponder and software which processes the data.

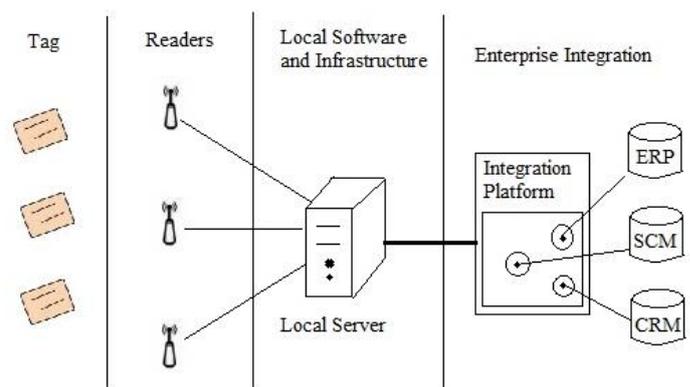


Figure 1: SCM with RFID in cloud

Transponder is also called as a tag. It contains antenna, microchip and casing. Reader emits radio waves if tag is in the field of the radio wave reads the tag. It is then transferred into

the readable format and database maintained at the cloud is updated.

Different RFID systems operate at different frequencies. [3]

C. Basics of SCM

SCM is a management of flow of goods, cash and information inside and outside of company that share same value chain. It includes the movement and storage of raw materials, work in progress inventory and final goods from origin point to consumption point.

Interconnected networks, channels and businesses are involved in the provision of products and services required by end customers in supply chain.

SCM has been defined as “design, planning, execution, control and monitoring of supply chain activities with aim of creating net value, building a competitive infrastructure, synchronizing supply with demand and measuring performance globally.”

SCM is a popular term. Some people see SCM as a directly applicable method to streamline the material flow. Some sees it as a flow philosophy and industrial process. [1]

Due to the globalization there is a competition among the supplier which increased need for the close relationship between supplier-customer which results in higher demands from customer. [4]

III. RFID IN SUPPLY CHAIN MANANGEMENT

Starting point of SCM is raw materials and end point is materials discarded or recycled. **FIG shows supply** for materials and information flow in RFID based manufacturing. Base of SCM is to focus on entire chain rather than actors on chain. Supply chain is seen as an entity not its constituent parties.

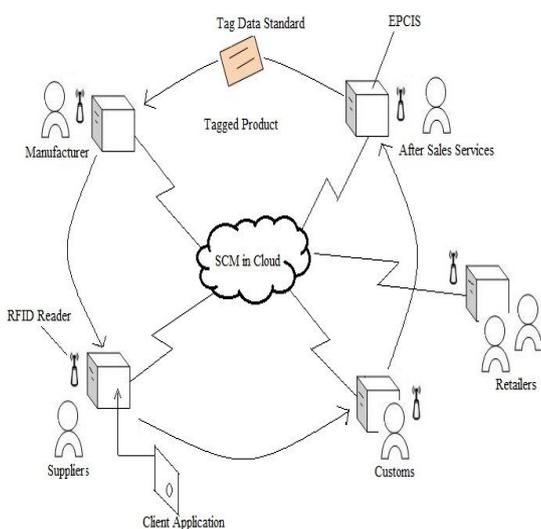


Figure 2: Architecture of supply chain management

SCM is characterized by three points-

1. Supply chain is a whole and it controls the inventory flows.
2. It has a strategy to combine internal and external system to coral system.
3. Has a customer focus.

IV. PROPOSED SOLUTION

This provides an effective solution to SCM challenges where goods manufacturers at one end of the world, shipped across the globe and sell products to other end of the globe. To achieve this aim many strategies are used by stakeholders by investing huge amount of money.

Proposed solution provides integration mechanism for SCM in cost effective ways. It introduces RFID as primary component for storing product data. Also, keeps their track across the chain.

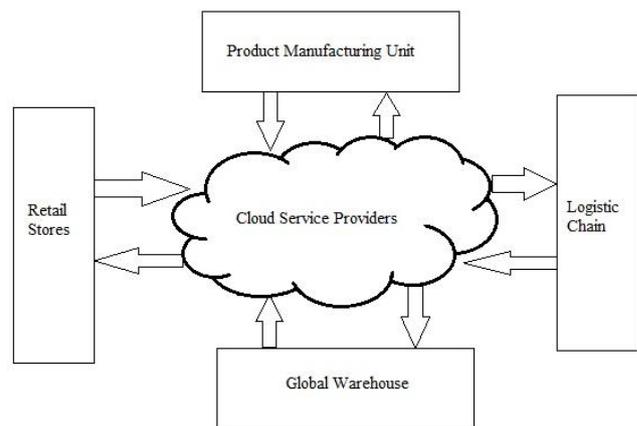


Figure 3: SCM over cloud

Process is like- Product manufacturers develop product inserts an appropriate EPC (Electronic Product Code) into tag attached to it. It is uploaded in centralized global database which is stored at cloud with EPC code as a key for product. This information can be accessed by manufacturer, logistic agents, warehouse managers and retail merchants. With EPC in tag logistic agents track the products across chain when product is on transit.

In Retail store EPC is used for shelf management and billing process. At warehouse manager products will be bifurcated to deliver to merchants.

V. CONCLUSION

This system provides unique way to Supply Chain Management using RFID. It addresses customer pain points,

and optimizes the IT cost. It also makes the information accessible from anywhere in the world. It shows RFID will form an excellent platform for cloud based SCM.

There are many other applications which can use this technique as below

1. Vehicle Tracking
2. Library Management
3. Health Care Services
4. Employee Management System

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