RFID Supply Chain Simulation Project

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Abstract

• Define readers in WinRFID reader network to build r infrastructure.
• Use WinRFID data capture and handling capability to simulate a Supply Chain Operation
• Roles involved: Customer, Retailer, Manufacturer, Warehouse
• Use Supply Chain Operations Reference Model (SCOR)
• Real-time data capture, process and notification
• Refer to Microsoft RFID Demo.

Introduction

In my project, Joey and I implemented a RFID simulation. We try to show how to track inventory in realtime. We regarded that 3 antennas are among Customer, Retailer, Manufacturer, Warehouse.

This simulation shows what, when, how many inventories flow to each part
Previous Research

Installation software (WinRFID, MSSQL)

Studying general RFID knowledge

Studying SCOR model

Analysis the WinRFID

[Project Main content]

- Hardware : IBM Laptop computer (CPU: Pentium M 1.06, RAM 314MB)
- References : MS RFID Supply Chain Demo.

1. The entire Scenario (Flow) Chart

This scenario is general and got rid of complex situations to make it simple.
2. User Interface

In this simulation, we divided UI into two parts, Processes Pages and Admin Page.

-> Processes Pages

There are 7 processes but several processes can be left out as Stock of each Inventory

-> Admin Page

Generate Dummy RFID Tags into DB

Set Inventories (In Stock Quantity)

Set RFID Readers

Track Tags by TagID or OrderID, and All
We can not only manipulate DB data, but also track the position where goods are by RFID TagID, OrderID or All, throughout AdminPage. It’s simple and has only necessary functions for simulation.

Each process page has the role of customer, retailer, warehouse or manufacturer. We can confirm the inventory of retailer or warehouse according to the level of process. And we have acts in the Process 4 Page (Manufacturer Page) that can generate products with RFID tags on them. And Each process is moved to next step as pressing ‘next’ button manually. the detailed instructions were left out, because it is simple.

3. DB Tables and relations.

As we see the diagram above, almost data that can be manipulated exist in DB. Temporary data is saved into Http Session object, though.
4. Source files

- DBManager.cs : it has many functions that do db jobs, get, set, update and so on.
- Utils.cs : it is reserved for further implementation.
- Header.ascx : nothing but we can add some decoration.
- workflow.ascx : it represents the draw of workflow(processes flow) that is at the top.
- Admin.aspx : administrator page
- Process#.aspx : each step’s page
- OrderComplete.aspx : it represents the end of order.

Summary

We had a chance for experiencing Supply Chain, RFID and .Net framework. This project seemed not to study small and detailed parts but to manage the flow. We can be to guess various applications of RFID as experiencing this project. Our project is supposed to work with real devices; readers and tags. We didn’t, though, because we have some problems applying Supply Chain to this project, which made us spend much time. Actually we made more various flows and designs than we thought, before simplifying a project. But we remained the possibility of extension with designs.

We appreciate your help and giving us chances that are meaningful. Thanks.
Reference

http://www.rfidjournal.com

http://www.seri.org

http://www.seri.org/forum/rfid

http://www.seri.org/forum/scmstudy

WinRFID

RFID Enabled Supply Chain Demo from Microsoft.