Case Studies of RFID Application

- RFID applied in Retail & Publishing Industry in Japan -

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  (Ministry of Economy, Trade and Industry)

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Field Trial Projects on RFID Applications in Various Industries sponsored by METI

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Case Study of RFID Application in Retail Industry

Field Trial Project of RFID Application at Mitsukoshi

- Overview of Mitsukoshi
- Characteristics of Japanese Department Store
- Issues Facing Ladies’ Shoes Retailers
- Information sharing among Makers/Wholesalers/Retailers in real time
- Process flow of Ladies’ Shoes
- Summary of the RFID Trial Project at Mitsukoshi
Field Trial Project of RFID Application at Mitsukoshi

Overview of Mitsukoshi

Established: Year 1673
Incorporated: 6th December 1904
Capital: ¥37.4B (273M Euro)
Sales Revenue: ¥888B (6.6B Euro in FY2004 Consolidated)
Selling floor space: 533,000m²
Number of Employees: 7,904 (11,425 Consolidated Y2004)

Source: Mitsukoshi
Characteristics of Japanese Department Store

- Comparison of Sales Efficiency among Department Stores in Europe, USA and Japan -

**Gross Margin Ratio**

- **Europe**: 45%
- **USA**: 40%
- **Japan**: 35%

**Inventory Turnover Ratio**

- **Europe**: 25 (Times/year)
- **USA**: 15 (Times/year)
- **Japan**: 30 (Times/year)

**Sales per square meter**

- **Europe**: 200 (K)
- **USA**: 400 (K)
- **Japan**: 800 (K)

- **3.5 times that of USA**
- **7.5 times that of USA**

**Strengths of Japanese Department Store**

1. Attentive customer care
2. A rich variety of merchandise
3. Short life cycle of merchandise

Source: Mitsukoshi
Issues Facing Ladies’ Shoes Retailers

< Characteristics of Goods >
- Wide Variations in size (6 sizes on average)
- Requiring inventory space
- Not distinguishable, as seen from the outside of box
- Short life cycle according to seasonality or trend in fashion

< Store characteristics >
- Need of going to backyard for checking availability of sizes
- Need of enough trial fitting
- Sales opportunity loss due to unavailable sizes

< Industry Characteristics >
- Heavy workload on inventory checking
- Huge distributor’s inventory due to the large number of items
- Difficulty in control of inventory due to seasonal function in shipping/receiving

Decided to try RFID PoC test in ladies’ shoes because issues are clear and quick return on investment is expected
Information Sharing among Makers/Wholesalers/Retailers in real time

Source: Mitsukoshi
Process flow of Ladies’ Shoes

**Maker**
- Shipping

**Wholesaler**
- Receiving Inspection
- Inventory Mgt.
- Attaching Tags
- Linking
- Shipping Inspection

**Retail**
- Receving Inspection
- Search via PDA
- Customer Self Service
- Sales Registration Detaching Tags (Reuse)
- Inventory
- Ledger

Source: Mitsukoshi
[ Summary ] Trial period: 12 October 2004 – 20 December 2004 (previous data)

- Query from terminal: 28 / person / day (10/person/day Note: out of inventory)
- Round trip to backyard: 15 / person / day (reduced from 20 / person / day)
- Service time per customer: 6 minutes / customer / (13 minutes / customer)
- Number of merchandise introduced: 3.1 / customer (1.7 / customer)
- Sales: 10% growth from the previous year

[ Feedback from sales clerk ]

Benefits
- Ease of use compared to bar-code reader (just hold a reader over tags)
- Due to real-time inventory access, alternatives can be offered on the spot

Issues
- About 1% inaccuracy of data during a two-week trial led to extra workload
- Difficult to identify broken tags

Source: Mitsukoshi
### Summary of the Mitsukoshi Trial Project (continued)


*Note: The figure in parentheses indicate previous data*

- **Commenced**: 26 April 2005
- **Merchandise**: 13 brands, 1,000 faces, 6,500 pairs (Styles & colors)
- **Store**: Nihonbashi 1st Floor ladies shoes carrier zone
- **Staff**: Total 10 (Average 7 / Day)
- **Queries from terminal**: 33 queries / person / day
  (15 / person / day due to out of inventory)
- **Service time per customer**: 5 minutes 35 seconds (13 minutes)
- **Sales (Compared with last year)**:
  - May: +9.9%
  - June: +22.2%
  - July: +25.4%

**Source:** Mitsukoshi
Summary of the Mitsukoshi Field Trial Project (continued)

[ Future Expansion of Ladies’ Shoes System]

• More brands in Nihonbashi store
  13 brands of one maker → 23 brands of 3 makers (in July 2005)

• Launch in Ginza store
  3 makers, 26 brands (in August 2005)

• Introduction in Sapporo, Nagoya, Fukuoka
  Targeted by February 2006

[ Future Expansion of Application area other than Shoes System]

• Better customer care through changing the way of clerks’ services

• Trial in apparel
  Planning in Men’s wear and Jeans → to use RFID in many items

• Future enhancement from customer perspective
  Customers do not use terminals → Inventory management function built in store fixture

Source: Mitsukoshi
Case Study of RFID Application in Publishing Industry

- Supply Chain of Publishing Industry and their Issues
- Incentives for adopting RFID
- Application Area
- Field Test for attaching RFID Tags to Books
- Field Test in Shipping & Receiving Process
- Flow of Test in Shipping & Receiving Process
- Field Test at Bookstore
- Summary of the Trial Project in Publishing Industry
Supply Chain of Publishing Industry and their Issues

4,000 Publishing Companies
74,800 New Books/Year
Agents
18,200 Bookstores
Customer (Reader)
Average ratio of unsold books return: 37%
Fixed Retail Price

Source: Japan Publishing Organization for Information Infrastructure Development (JPO)
Request of source tagging from bookstores
- Adopt RFID Tags in order to prevent shoplifting
  * Average annual amount of shoplifting damage;
    \$2,120K (15.5K Euro) / store
  * Average annual sales revenue;
    \$103M (752K Euro) / store
- Attach RFID Tags to books in binding process

Establish a RFID study organization in the Industry
  (IC Tags Study Committee in JPO: Japan Publishing Organization for Information Infrastructure Development)

JPO conducted the Field Trial Project as a project owner.

Source: JPO
Application Area

- Detect illegal transactions (Shoplifting, Unauthorized unsold books return, Breach of official release date)
- Realize efficient distribution and traceability
- Optimize inventories in the industry
- Stimulate new demands (Strategic Marketing tool)
- Utilize RFID in Library
Field Trial Test for attaching RFID Tags to Books

Added RFID Tags attaching & reading process to the current binding process.

**Objectives:**
- Verify throughput speed in the process line.
- Verify breakage of RFID Tags through the process. (pressure, high temperature, shock, signature, etc.)

1. Attaching RFID Tags on a page
3. Binding
4. Cutting
5. Finishing

Source: JPO
Field Trial Test in Shipping & Receiving Processes

1. Shipping/Receiving Inspection
2. Taking Inventory
3. Picking Inspection
4. Issuing Slips
5. Packing Inspection
6. Settlement
7. Returning process (sorting, refinishing)

Testing reader accuracy at inspection of each book (line)

Testing accuracy in bulk-reading

Testing reader accuracy at inspection of each book (hand work)

Source: JPO
Test-flow of Shipping & Receiving Process

Shipping/Receiving Inspection Test Model
- Packing
  - Pallet, Corrugated Box, Collapsible Container, Bucket
- Contents of package
  - Single/Mixed (Hardback Book, Comic Book, Magazine, Dummy Book, etc.)
- Packing Volume
  - 10, 40, 60
- Moving vehicle
  - Table, Forklift Truck, Belt Conveyer, etc.
- Inspection Unit
  - Book, Package

Picking process Test Model
- Shelf
  - Metal Shelf, Wooden Shelf
- Packing style
  - Bulk
- Setting
  - Flat, Vertical
- # of Book
  - 50 - 100

Source: JPO
Field Trial Test at Bookstore

Total Test including Marketing, Sales Management and Used-bookshop

**Browse-only Statistics**
- Books’ information, Browse-only rating, in Graphical Display

**Sales process at cashier**
- Sales process
- Preventing shoplifting

**Referring Sales Information**
- Growth rate, Hit ratio, Inventory, etc

**Collect marketing data such as browsing time statistics**

**Secondhand Bookstore**
- Check sales flag and detect books posted via illegal channel

**Refer books information such as location**

**Book order traceability**

Source: JPO

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Summary of the Field Trial Project in Publishing Industry

- **Increase** Sales Revenue
  - Estimated $111B Yen / Year
  - (810M Euro / Year)

- **Reduce** Returned Books Process Cost
  - Estimated $83B Yen / Year
  - (606M Euro / Year)

- **Optimization of Volume of Books in Supply Chain**
  - Saves Inventory Cost
  - Estimated $340B Yen / Year
  - (2.5B Euro / Year)

- **Reduce Amount of Shoplifting Damage**
  - Estimated $46B Yen / Year
  - (336M Euro / Year)

Profit for all parties of the Industry
Profit for Publishers & Agents
Profit for Bookstores

Source: JPO
Thank you for your attention!

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