Design and Implementation of an RFID-Based Customer Shopping Behavior Mining System

Abstract:

Shopping behavior analysis is of great importance in understanding the effectiveness of marketing and merchandising campaigns. Deep shopping behavior data can help retailers capture customers’ preferences, test new arrivals, and adjust marketing strategies. Mining customer shopping behavior in online stores is achievable by analyzing click streams and shopping carts. RFIDs are emerging as an essential component of Cyber Physical Systems. Many well-known garment manufacturers (e.g., Abercrombie & Fitch, Calvin Klein, Decathlon) adopt passive RFIDs for sales tracking and anti-counterfeiting.

Existing System:

While wireless signals such as Wi-Fi are prevalent for activity recognition in smart homes and smart offices, RFID-based solutions are preferred in human-object interaction such as shopping behavior monitoring and recognition. Shop Miner is inspired by this trend of wireless sensing, and is particularly related to the following categories of research.

Offline Shopping Behavior Mining: Despite the academic and commercial success in online shopping data acquisition, there have been few for offline shops.

Shopping Behavior Recognition With Wearable Sensors: Examined the impact of six kinds of activities on customer behaviors using smart phone sensing.

RFID-Based Context Sensing: Designed an RSS-based RFID system to track the tag order for baggage sorting.

RFID Systems in Physical Stores: Deployed an RFID system in an apparel retail store for both operational (e.g., inventory management) and experiential (e.g., interactive fitting room) enhancement.
Proposed System:

We present the design, implementation and evaluation of ShopMiner, an RFID-based shopping behavior mining system for physical clothing stores. With an RFID tag attached to each garment, ShopMiner could detect which garments customers stop beside, pick out, turn around, or pair up. Such shopping behavior data could benefit retailers to discover popular categories, hot items, and correlated pairs for better trading strategies and tie-in promotions. We examine the accuracy and robustness of ShopMiner in various testing scenarios. Results show that ShopMiner achieves high accuracy in customer shopping behavior identification and holds potential for practical deployment.

Modules:

➢ RFID-Based Customer Shopping Behavior Mining System

SYSTEM REQUIREMENTS

H/W System Configuration:-

Processor : Pentium –III
RAM : 256 MB (min)
Hard Disk : 20 GB
Key Board : Standard Windows Keyboard
Mouse : Two or Three Button Mouse
Monitor : SVGA

S/W System Configuration:-

Operating System : Windows95/98/2000/XP
<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Server</td>
<td>Tomcat 5.0/6.0</td>
</tr>
<tr>
<td>Front End</td>
<td>HTML, JSP</td>
</tr>
<tr>
<td>Scripts</td>
<td>JavaScript</td>
</tr>
<tr>
<td>Server side Script</td>
<td>Java Server Pages</td>
</tr>
<tr>
<td>Database</td>
<td>MySQL 5.0</td>
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<tr>
<td>Database Connectivity</td>
<td>JDBC</td>
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