

Smart shelf-management system for retail

Introduction

Besides from traditional ways like analyzing buying history, customer feedback and customer loyalty card data, retailers today have a whole spectrum of ways to observe customer behavior and make appropriate changes to increase sales and customer satisfaction.

One of the innovative technologies like the **smart shelf-management system** provides retailers with new revolutionary tools for observing customer behavior. It utilizes technologies like RFID, IoT and a variety of sensors to gather item-level visibility for almost any merchandise. Visibility is the key foundation to optimize overall performance and enhance the shopper experience in retail.

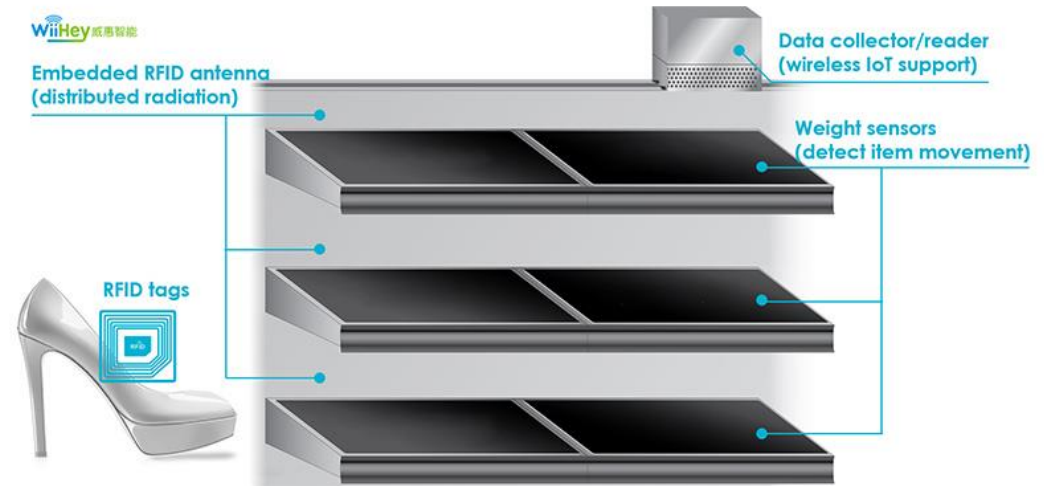


Observing customer behavior in retails

Smart shelf-management system

Smart shelves are wireless inventory control system that has been typically fitted with weight sensors and RFID tags:

- The weight sensors can be built-in the shelf itself or be installed under normal shelves. These weight sensors consistently notify the back-end system about the existing quantity of items on the shelves. Usually small-sized goods or soft flexible goods like clothes can be measured by weight sensors.
- The RFID tags and RFID reader (antenna) can be built-in the shelf itself or be installed behind/under/above normal shelves. By continuously scanning the RFID tagged items on the shelf, the RFID reader consistently notifies the back-end system about the existing items and their movements. Usually relatively big-sized goods like shoes can be measured by RFID method.
- Other sensors like optical sensor and switch sensor can also be applied to monitor merchandise item position and automate intelligence into on-the-shelf inventory levels.



A smart shelf with various sensors and RFID tags

By tracking merchandise items, their movements and whereabouts, the system directly tells retailers with information that can be analyzed and translated into customer preferences like marketing trends and hot spots, which is much more understandable than traditional camera-based video analysis. Thereby smart shelves provide retailers with simple ways of improving their customer service and increasing sales.

Key features

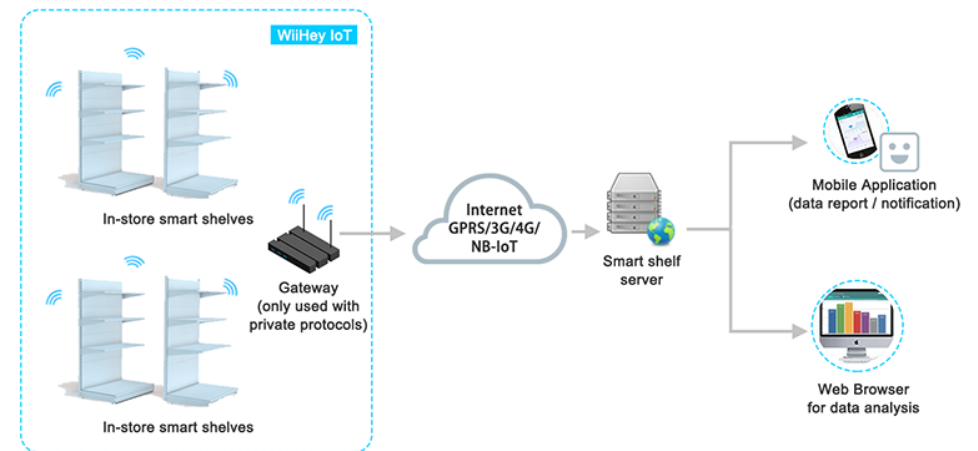
- Equipped with dozens of sensors and RFID that detect the merchandise item movement;
- Wireless data transmission via IoT network, easy to install and free maintenance;
- Prevent Out-Of-Stock situations by alerting when stock level gets low or critical;
- Smart friendly cloud based program that provides both real time status information;
- Analyze data that has been collected from the shelves and produces business insights;

Benefits

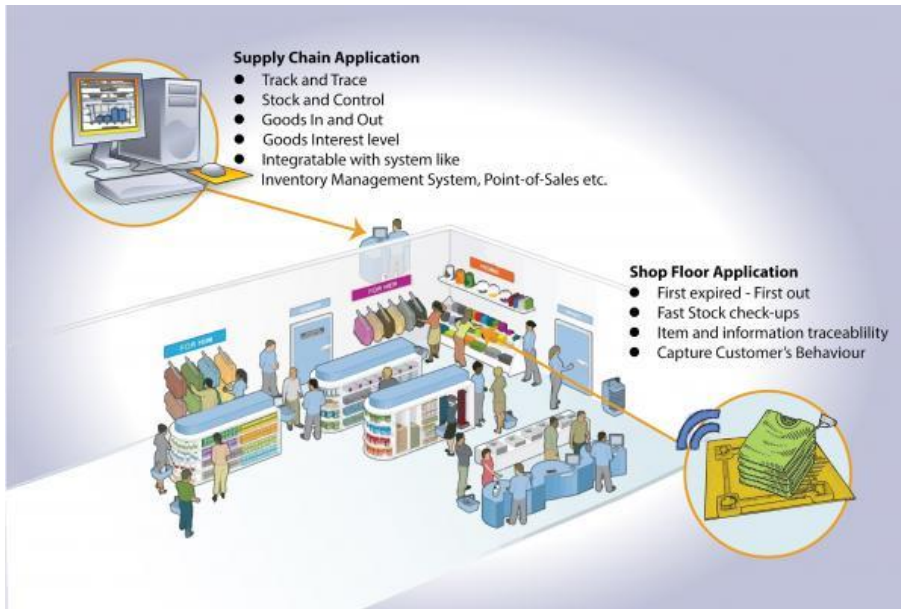
- Gain valuable insights of customer behavior and customer interests;
- Automatic replenishment alert notification for Out-Of-Stock situations;
- Foundation of advanced inventory management like misplaced item alert, expired date alert;
- Foundation of location-based services like added product information and promotion;
- Optimize overall store performance and enhance the shopper experience;

Architecture

The smart shelf supports narrow band (NB) IoT communications technology and WiiHey's private wireless protocol as well, with which the system achieves well signal coverage in indoor environments. Data are transmitted to cloud datacenter across the IoT network for processing and fusion. Eventually, shop operators could view merchandise status and statistical analysis from a cloud-based dashboard.



Smart shelf-management system architecture



Smart shelf-management system for illustration

Summery

Many stores are beginning to understand the advantages that the smart shelf-management system offers for not only managing purchasing histories but also measuring marketing trends and customer preferences, including how often and long products are picked up by customers.

In view of the system's tremendous capacity to monitor and manage thousands of items in real time, WiiHey will continue to develop the system in combination with people tracking & counting solution with the aim of creating a differentiated shopping experience and boosting sales and customer engagement for retailers.