GS1 Japan

The Global Language of Business

Case Study: NIPPON ACCESS Uses EPC/RFID to Track Cage Trolleys

NIPPON ACCESS, INC. (NIPPON ACCESS) is a general food wholesaler with approximately 500 distribution centers located nationwide across Japan. Logistics is also one of the core businesses and services including “3PL operations” where the company operates the customer’s distribution center from warehouse management to delivering goods to retail stores. The company also provides transportation services as a logistics company specializing in food.

To cope with changes in the environment surrounding logistics such as aging workforce, increases in working hours and declines in salary levels, NIPPON ACCESS has adopted various tools for improving operational efficiency. Tracking cage trolleys using RFID is one such example.

To track individual trolleys, NIPPON ACCESS uses a GS1 Identification Key, GRAI (Global Returnable Asset Identifier), which uniquely identifies assets such as reusable transport tools and containers.

Motivation for EPC/RFID Implementation

NIPPON ACCESS originally tracked its cage trolleys by barcode. Having to scan the barcode on each trolley one by one, however, complicated the operation and also there were durability problems; barcode labels often got detached from trolleys due to rubbing. The company purchased 300 new cage trolleys every year to compensate for missing ones. For these reasons, NIPPON ACCESS decided to use RFID.

At the beginning, RFID tags were read only with Handheld RFID Terminals (HHTs). Additional workers were engaged to perform this task and it resulted in reduced productivity.

To solve this problem, NIPPON ACCESS adopted the “Access Gate-through System (AGS)” in 2014, developed jointly with KIBUN TRADING, INC. and NIPPON FILING CO., Ltd. With this system, the RFID tag placed at the top of each cage trolley is read by gate-type RFID readers. As a pair of RFID antennas is installed at each gate (i.e. dock shelter), a truck driver can simply load cage

trolleys onto a truck through a gate. RFID tags on the cage trolleys are read automatically.

System Features

NIPPON ACCESS uses passive UHF (Ultra-High Frequency) RFID tags for AGS since UHF can read multiple tags at the same time and its read range is much wider than other frequency bands. At this particular distribution center, approximately 1,200 RFID tags on cage trolleys can be read in 30 minutes.

The RFID tags are attached to cage trolleys using durable and longer life attachment. The attachment also works to keep tags from being directly attached on the metal surface of a cage trolley and thereby ensures reading performance. (See Fig. 1)

Identification keys encoded in the RFID tags are GRAI. By using this globally unique identification key, NIPPON ACCESS can uniquely identify its own cage trolleys even in situations where they get mixed up with other companies' trolleys on the premises of the destination retail store.

Fig. 1 RFID tag attached to the top of a cage trolley

Workflow Outline

The dispatch workflow is as follows;

(1) Distribution center personnel set the shipping destination for cage trolleys loaded with items using an HHT.

(2) The transport truck driver enters the shipping destination data into one of the RFID gate readers at the loading dock using an HHT.

(3) Now the driver only needs to carry out the normal loading operations as dispatch data processing and the loading check are performed automatically when the cage trolleys pass through the gate (See Fig. 3).

- Each time the tag on a trolley is read, the driver will hear an automated voice stating the gate number that allows him/her to confirm the tag was read properly.
- If the driver tries to load incorrect cage trolleys for the destination or trolleys for which the shipping destination has not been entered, the driver will hear an error sound indicating loading errors.

(4) When cage trolleys are returned from retail stores, this is automatically recorded by simply passing the trolleys through the gate. Some cage trolleys come in without going through the gate due to space limitations. These tags are read manually with an HHT to eliminate differences in the received quantity.

Fig. 2 Workflow using AGS

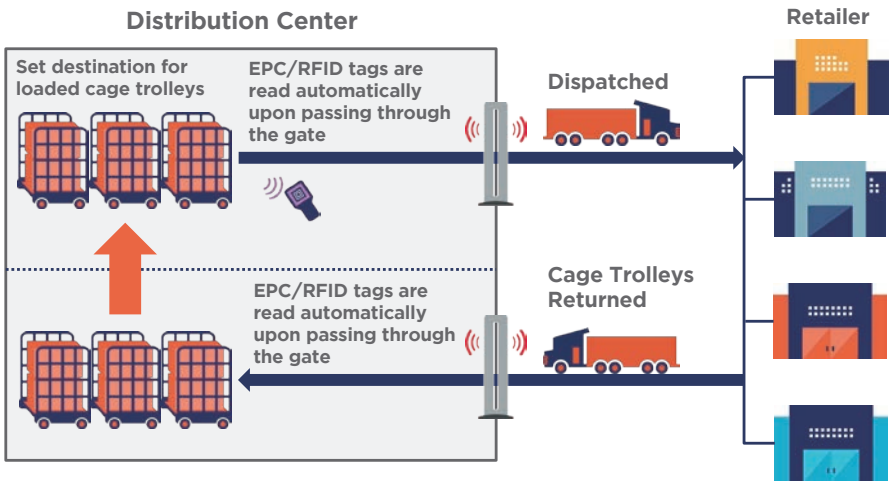


Fig. 3 Cage trolleys passing through the gate

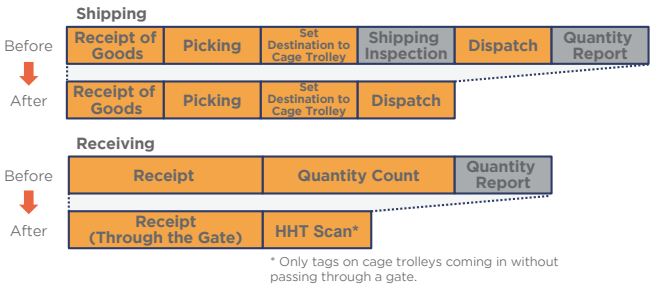
- When a new data set of a cage trolley and its destination is sent to the server, the corresponding trolley is automatically processed as received. Therefore, once trolleys return from retail stores, new destinations can be assigned.

Results of AGS Adoption

Prior to the adoption of AGS, cage trolleys were lost track of one after another during busy seasons. As there was no way of knowing their locations, NIPPON ACCESS would send a request to all the partner retailers to return missing trolleys. After the adoption of AGS, dispatch and receipt of cage trolleys to and from the retail stores are tracked daily. As the location of trolleys can be identified, NIPPON ACCESS can now ensure all trolleys dispatched are returned. Moreover, since 1,000 previously missing cage trolleys were returned, purchase of additional trolleys is not necessary for some time in the future.

In addition, loading errors, such as cage trolleys being left behind or being loaded onto the wrong truck, are prevented by using a dispatch schedule that contains data of cage trolleys and their shipping destinations. AGS also reduced the workload of drivers and distribution center workers by eliminating tasks such as manual barcode scanning at dispatch. (See Fig. 4)

Fig. 4 Operations before and after the adoption of AGS



Next Step

By using EPC/RFID to track cage trolleys, data is constantly accumulated on how many trolleys are at each store and how long they stay there. For the next step, NIPPON ACCESS is considering utilizing this accumulated data to better manage cage trolleys by, for example, specifying the optimum number of trolleys at each store at any given time based on the data.

In the future, NIPPON ACCESS also expects to establish visibility of transported items for both distribution centers and retailers by associating the data of a cage trolley with the items loaded on it and the truck transporting it. In addition, with the visualization of the movement of items, NIPPON ACCESS hopes to achieve labor saving in the area of correspondence with retail stores on the item shipment status.

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