RFID Lab - Press release

RFID in the Fast Moving Consumer Goods supply chain: the results of the first Italian experience

The RFID Logistics Pilot project highlights the benefits of RFID technology and EPC Network implementation for the optimal management of the Fast Moving Consumer Goods supply chain

Parma, October 1st, 2008

The first experimental phase of the RFID Logistics Pilot, the first integrated RFID (Radio Frequency IDentification) pilot project in the Fast Moving Consumer Goods (FMCG) field, has recently been completed.

The project

The project was officially launched in June 2007 inside the RFID Lab of the University of Parma, in collaboration with thirteen national and multinational companies, operating as manufacturers, distributors, logistic providers and retail companies in the FMCG supply chain, and actively participating in the RFID Lab research activities. Among others, the company panel includes Auchan, Carapelli, Chiesi, Corriere Cecchi, Conad, Danone, Grandi Salumifici Italiani, Goglio, Nestlé, Number 1, Lavazza, Parmacotto, and Parmalat.

The project is the first Italian example of a pilot implementation of RFID and EPC Network (the so-called "Internet of Things"), enabling to track and trace the flow of products from manufacturers to the final customer.

The main objective of the project was to test and check, by in-field experiments, the technical feasibility and benefits of RFID technology, coupled with the Electronic Product Code (EPC) system, when applied to the supply chain processes.

An innovative, and probably unique, aspect of the RFID Logistics Pilot project is the methodology followed during its development. In fact, companies involved in the project shared not only the cost of the project itself, but also the design choices, experimentations and the resulting know-how. Hence, only some companies provided manufacturing sites, warehouses and retail outlets for the in-field experiments, while the know-how developed will be shared between all participants to the working group.

The supply chain examined during the pilot involved a manufacturer of food products, its distribution center (DC), a distributor's DC and two retail stores. More than 10,000 cases of product were equipped with RFID tags, which were coded with a unique SGTIN serial number. The flow of cases and pallets, this latter identified through RFID tags and SSCC codes, was traced through the DCs and retail stores, and the data obtained were shared through the EPC Network.

The field experiments involved a DC of Parmacotto, an Italian company leader in the production of sausages and sliced whole, a DC and two department stores of Auchan, one of the main reality of large retailers operating in Italy.

The technology partners of the laboratory RFID Lab also contributed to the project, by providing the RFID hardware and software equipment required for field testing. As regards to the software

infrastructure to manage the flow of data generated from RFID reads, this has been designed and developed by Id-Solutions, spinoff company of the University of Parma and Alliance Partners of RFID Lab, under Oracle technology. A group of companies, including (in alphabetical order) Avery Dennison, Caen RFID, Impinj, Intermec, Jamison Doors, Motorola, Psion Teklogix, Siemens, Toshiba TEC, UPM, provided most of the required RFID hardware.

The project also had the support of universities adhering to the Global RF Lab Alliance Network.

The results

The experimental campaign took about 5 months, from May to September 2008. In that period, approx 12,000 cases and 800 pallets were equipped with RFID tags and followed in the supply chain involved in the Pilot project.

The main results obtained can be categorized as "technological" (i.e., related to the use of RFID technology), and "managerial, referring to improved supply chain visibility enabled by the 'Internet of Things".

From a technological point of view, the main results are summarized in the following points:

- ✓ 100% accuracy of RFID reads through RFID gate at pallet level and 96% at case level. The case level results may be increased to 99.4% by combining RFID reads with checks performed by an employee. The latter result, lower than 100%, suffers from the fact that, under some circumstances, manual checks by employees are not performed;

- ✓ 86% of pallets were fully identified through RFID gate during shipping and receiving processes. Hence, only 14% of pallets received/sent (corresponding to about 1.5 cases per pallet) required an additional manual check to identify unread cases;

- ✓ development of innovative applications (such as Discovery Services), supporting the EPC Network and enabling secure exchange of information and traceability of data between supply chain partners;

- ✓ 68% reduction in time required to check product at the manufacturer's site, with automated checking of quantity and mix of product shipped;

- ✓ 80% reduction in time required to receive product at the retailer's DC, thanks to automated identification of cases and pallets and possibility to retrieve related information through the EPC Network.

From a more managerial perspective, the main implications of the project on the relationships between supply chain partners can be summarized as follows:

- ✓ inventory reduction: the complete visibility of product on the store shelves allows the manufacturer to improve its production planning, reducing its safety stock of about 70%. Thanks to real-time monitoring of the amount of product on the shelf, the manufacturer is also able to derive daily estimates of the final customer's demand, improving forecasting accuracy. As a result, a lower variance in demand is observed, with a corresponding reduction of safety stocks;

- ✓ possibility to real-time check product sales during sale promotions: during the experimental campaigns, two promotional periods were identified, one of which (from Monday 22 to Saturday 27 September 2008) involved one of the Auchan's retail stores examined in the pilot. In that circumstance, product reached the retail stores early (in particular, on September 19), allowing to anticipate the promotional period. Thanks to real-time visibility

enabled by RFID technology, possible intervention could be undertaken in the case delays are observed to avoid stock-outs;

✓ real-time monitoring of product on the store shelves thanks to reliable RFID reads between expositive area and backroom. In particular, empty cases were identified during the trash. About 440 cases (vs. 444 expected) moving from the backroom to the store shelves were read in the trash, with 99.1% accuracy. Punctual checks of product availability on the store shelves can significantly reduce out of the stock on the store, thus increasing turnover for manufacturers and retailers. Although the project did not allow quantifying this effect, it allowed to demonstrate the potentials of RFID technology in this regard;

✓ automated billing: the use of RFID technology demonstrated that all cases are identified (with 100% accuracy) at least once through tracking points sited in the retailer's supply chain. This result, in turn, allows introducing automated billing processes. Under this scenario, once data warehouse (EPCIS) systems of manufacturer and retailer have been certified, cases could be automatically billed by the supplier during its first identification at the customer's site. As a result, significant savings (about 48%) could be achieved in administrative costs, bills management and misalignments rectification;

✓ RFID enables real-time monitoring the quality of product reaching the store shelves, in terms of remaining shelf life. This is particularly relevant for fresh product, with limited shelf life. In this regard, the experimental campaigns shown a positive situation, as fresh product, with shelf life ranging from one to two months, were always available on the store shelves with a remaining shelf life of more than 66%.

Future developments

On the basis of the results obtained, the companies are willing to consider possibility of further experiments.

In particular, the scope of the project could be broadened, by investigating the implications of moving from a relatively simple supply chain, as the present one (with one type of product and a limited number of players per echelon), to a complex supply networks.

Hence, the second phase of the project, which should probably start in 2009, will encompass:

- a variety of products from different manufacturers,

- a plurality of actors (i.e., more than one supply chain player per echelon examined, possibly including logistics operators);

- more complete tests, which will include monitoring of environmental parameters (such as temperature or humidity).

While during tests performed RFID processes were performed in addition to existing processes, during further experiments it is preferable to replace the existing processes with new ones, thus fully implementing the technology in real operations.

The project will still be managed on a "shared" perspective, where also companies that were not involved in the first phase of the project could join the future tests.

Links

www.rfidlogisticspilot.com

www.rfidlab.unipr.it

About

RFID Lab stems from multi-year research activities performed at the Department of Industrial Engineering of the University of Parma. The lab focuses on exploring the applications of RFID technology and the EPC system to business processes.

Founded in 2006 by Prof. Antonio Rizzi, RFID Lab was the first Italian laboratory which tested RFID UHF class1 gen2 applications, and aims at becoming a main research center for RFID applications both in the Italian and international context.

Research activities, first focused on the food and fast moving consumer goods fields consumer, encompass several market segments, including, among others, paper, textiles, pharmaceuticals, health care and public administrations.

All the companies that experiencing significant issues in product flows "visibility" and "traceability" along the supply chain, involving inefficiency and waste, may substantially benefit from RFID technology implementation and research activities performed at the RFID Lab.

The RFID Lab technological partnership encompasses more than twenty companies, market leaders in their fields. The technology partners provide the hardware and software required for testing and experiments, and receive feedback on performance, compatibility and ease of integration of hardware and software solutions with business processes. A panel of leading user companies, mainly from the food and fast moving consumer goods fields, define the research activities of the RFID Lab, and benefit from the research results. Technology transfer allows those companies to maintain their competitive position through state-of-the art knowledge of RFID solutions.

Some of these companies, such as Apoconerpo, Conad, Nestle, also developed tailored research projects with the laboratory for specific purposes.

The laboratory is part of a network of international labs, including the Global Alliance Lab RF network, which is headed by Antonio Rizzi, founder and coordinator of RFID Lab, and the Auto-ID labs at the Massachusetts Institute of Technology.