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Wal-Mart Improves On-Shelf Availability Through the Use of Electronic Product Codes

University of Arkansas Study Quantifies RFID-Initiated Improvements

BENTONVILLE, Ark. – Oct. 14, 2005 – Wal-Mart customers found items they wanted in stock more often due to the retailer’s use of electronic product codes (EPCs) powered by radio frequency identification (RFID) technology when compared to control stores. This is according to an independent University of Arkansas study’s initial findings.

Researchers at the University of Arkansas found a 16 percent reduction in out-of-stocks. Additionally, the study also showed that out-of-stock items with EPCs were replenished three times faster than comparable items using standard bar code technology. Equally important, Wal-Mart experienced a meaningful reduction in manual orders resulting in a reduction of excess inventory.

“This is no longer a take-it-on-faith initiative,” said Linda Dillman, executive vice president and cio for Wal-Mart. “This study provides conclusive evidence that EPCs increase how often we put products in the hands of customers who want to buy them, making it a win for shoppers, suppliers and retailers.”

The 29-week study analyzed out-of-stock merchandise at 12 pilot stores equipped with RFID technology and 12 control stores without the technology. All Wal-Mart formats – Supercenters, Discount Stores and Neighborhood Markets – were included in the study.

The Study

This comprehensive study is the first to compare the impact of EPCs on merchandise availability in functioning stores. While Wal-Mart commissioned the study, it was conducted independently by the University of Arkansas.

Specific items were selected to be analyzed at the beginning of the study and these items remained constant throughout the entire process to ensure data consistency.

To both establish a pre-study baseline and to measure the impact of RFID, out-of-stock items were scanned every day throughout the study period, at the 24 stores. Other than the introduction of EPCs and RFID technology, the stores continued to operate normally.

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The study design allowed the researchers to examine differences between the 12 control stores and the 12 RFID-enabled stores. It also provided the ability to compare performance in the same stores through analysis of the baseline data and the data collected during the use of EPCs.

Dr. Bill Hardgrave, director of the RFID Research Center at the University of Arkansas and executive director of the Information Technology Research Institute, oversaw the study. “Our analysis consistently found – throughout the test period – that the RFID-enabled pilot stores statistically outperformed the control stores without RFID technology in terms of providing improved on-shelf availability of items for customers,” Hardgrave explained. “Essentially, this meant fewer total out-of-stock items and fewer occurrences of empty shelves when the merchandise was in the backroom.”

The Results

As part of its standard processes, Wal-Mart has focused on driving improved product availability for its customers through a series of initiatives unrelated to RFID technology. The research was structured to isolate the impact of RFID to be able show the improvements directly attributable to the RFID process improvements. “The study showed RFID-enabled stores were 63 percent more effective in replenishing out-of-stocks than the control stores,” Dillman said. “The Wal-Mart RFID team knew that this technology would have a huge impact on out-of-stocks. Now we have an independent study that confirms RFID has a significant impact in retailing,” Dillman continued. “However, we are not stopping there. This is only one of many changes that RFID will bring. We are already working on initiatives and enhancements that will build on this success.”

“The 16 percent reduction in merchandise out-of-stocks was determined by physically scanning out-of-stocks at the shelf every day. A baseline was established and this was then compared to the number of out-of-stocks in both sets of stores once the RFID technology was enabled in the pilot stores,” explained Hardgrave. “The net result of the impact of RFID, removing any other influences, was a reduction of 16 percent in the occurrences of products being out-of-stock on the shelf.

“In addition to comparing the pilot stores to the control stores,” Hardgrave continued, “we took our study one step further by analyzing the EPC tagged and non-tagged merchandise within the same store. We knew that by analyzing these elements, we could further validate the positive impacts we were seeing. And, in fact, this comparison showed us yet again that RFID made a quantifiable difference. Out-of-stocks on EPC tagged items were reduced at a rate more than three times faster than that of the non-tagged items within the same store.”

Beyond improvements in in-stock, Wal-Mart also sees benefits in overall inventory reduction, which is key to driving costs down. “The initial changes we made in our stores didn’t stop at reducing out-of-stocks. We are also using the technology to reduce our inventory in the whole supply chain,” said Rollin Ford, executive vice president for logistics in Wal-Mart. “With little effort we have been able to make inroads into this area. Manual orders placed by stores were reduced by approximately 10 percent. However, as Linda Dillman has said, impacting in-stocks is only the start.”

In response to the system and process changes made by Wal-Mart, Hardgrave added that “through our analysis, you can clearly see the positive impacts each time Wal-Mart made system enhancements to take advantage of the new data. It really has been quite amazing.”

Details and findings of the study will be made available in the near future via a series of white papers released by the University of Arkansas.

Technology – EPC Generation 2

From the very beginning of its initiative, Wal-Mart has consistently communicated its desire to move to the Gen2 standard of EPC tags once they became available. Gen2 provides a truly global standard that works well in all geographic regions around the world. This will drive a faster reduction in costs of the technology, all leading to the acceleration in adoption.

“We have continued to encourage our suppliers to purchase hardware that was easily upgradeable to Gen2. We also asked them to consider this fact when purchasing tags,” Dillman said.

Encouraged by the development and ratification of Gen2 standards in record time, Wal-Mart is now in the final stages of testing this global standard. “The early testing of Gen2 has proven to be very successful as we are seeing improved read rates,” Dillman added.

The costs for Gen2 tags will be reduced as this technology becomes more widely used. The good news on this front is that the actual starting price of this technology is much lower than Gen1’s current price.

“Gen2 truly makes the ‘sub 10-cent’ tag become a reality,” Dillman stated. “Additionally, for our suppliers, Wal-Mart will be ready to accept cases and pallets tagged with Gen2 tags beginning in January 2006 in our existing RFID-networked stores, clubs and distribution centers.”

As suppliers went live with RFID and began tagging additional SKUs in their product mix, the cost of the tags was the number one driver. With prices of tags being reduced by over 70 percent in some instances, Wal-Mart fully expects suppliers to start tagging additional SKUs in 2006. Additionally, in mid-2006, Wal-Mart expects to stop receiving Gen1 tags, so that they and their suppliers can transition to a pure Gen2 environment.

“But don’t wait -- make the transition to Gen2 as soon as possible,” Dillman encouraged suppliers.

Future Plans and Next Steps:

As Wal-Mart announced earlier this year, it is currently more than tripling the number of stores where RFID has been installed. By the end of October, Wal-Mart will have more than 500 stores and clubs and five distribution centers live with RFID.

During January 2006, Wal-Mart’s next top 200 suppliers will be live, shipping EPC-tagged cases and pallets. As with its top 100 suppliers, Wal-Mart has collaborated with these next top 200

suppliers, hosting a number of briefings and seminars to share knowledge back and forth. A number of the suppliers who went live in January 2005 also participated with the next 200, passing on their learnings and areas of benefit within their organizations.

In addition to the store and distribution center expansion this year, Wal-Mart will continue its rollout during 2006 and double the number of stores that are enabled, along with distribution centers that service the enabled stores. By the end of 2006, more than 1,000 stores, clubs and distribution centers will be using RFID to deliver improved service to customers.

For 2007, Wal-Mart expects the next wave of 300 suppliers to start shipping tagged cases and pallets by January 2007. Combining the 100 suppliers from 2005 with the 200 suppliers during 2006, this will bring the total number of suppliers live in early 2007 to over 600.

Summary

In conclusion, RFID is working today at Wal-Mart and is making a real difference for its customers, members and associates. In the study, the University of Arkansas analyzed performance in four main areas:

1. Control versus pilot
2. Pre/post pilot
3. EPC tagged versus non-tagged items in pilot stores
4. Overall performance

In all instances, the study found a significant difference where RFID was used. Wal-Mart is executing its rollout plan to bring additional stores, clubs and distribution centers online, both through this year and in 2006. Wal-Mart will be ready to accept Gen2 tags during January 2006, enabling its next wave of suppliers to start with Gen2 tags from the start. As Wal-Mart increases its enabled facilities and as costs continue to fall, Wal-Mart expects its suppliers to tag more volume.

About Wal-Mart

Wal-Mart Stores, Inc. operates Wal-Mart Stores, Supercenters, Neighborhood Markets and SAM'S CLUB locations in the United States. The company operates in Argentina, Brazil, Canada, China, Costa Rica, El Salvador, Germany, Guatemala, Honduras, Japan, Mexico, Nicaragua, Puerto Rico, South Korea and the United Kingdom. The company's securities are listed on the New York and Pacific stock exchanges under the symbol WMT. Last year, Wal-Mart Stores, Inc., contributed more than \$160 million to support communities and local non-profit organizations. Customers and associates raised an additional \$70 million at stores and clubs.

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