

RFID



Dear readers,

The METRO Group and its partners are looking forward to an eventful year. In the spring, the conversion to the new transponder standard "Class 1/Generation 2" will likely be effected. Furthermore, we will roll out RFID at the box level over the course of the year. Another high point is CeBIT, which will take place in Hanover (Germany) in March 2006. The METRO Group will be the first retail company to present RFID technology at this leading international trade fair for information and communications technology. Please read our cover story for more information on these highlights. But that isn't all: right on time for the turn of the year, we bring you a retrospective of the months following the RFID roll-out in the METRO Group in November 2004.



The 2006 CeBIT is also the subject of our interview with Ernst Raue, Member of the Management Board of Deutsche Messe AG. For the first time, the fair will have a separate exhibit area for the topic of "Auto ID/RFID." This confirms once again that RFID is a key technology – not just for the retail sector.

For an exciting example of the application of RFID technology in logistics, please read our background story on the world's most modern container terminal at the port of Hamburg (Germany).

We hope you enjoy your reading and wish you a great start into the new year.

Yours,

A handwritten signature in black ink, appearing to read "Zygmunt Mierdorf".

Zygmunt Mierdorf
Member of the Management Board
of METRO Group

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METRO Group
Future Store Initiative



A FRESH NEW YEAR FOR RFID

IN 2005, THE METRO GROUP INTRODUCED RFID IN THE AREAS OF LOGISTICS AND WAREHOUSE MANAGEMENT. A look back at the past few months shows impressive progress and also sets the tone for the new year of RFID: in 2006, the focus of the METRO Group and its partners will once again be on this key technology.

The start signal was given in November 2004: about 14 months ago, the METRO Group began introducing RFID technology step by step along the entire supply chain at Metro Cash & Carry, Real and Galeria Kaufhof. By now, 35 partners from the consumer goods industry are on board, including international manufacturers such as Procter & Gamble, Johnson & Johnson and Esprit. The first phase of the roll-out focused on warehouse management and logistics: the participating industrial companies affixed RFID transponders to the pallets intended for the METRO Group.

The first success

Shortly after the introduction of RFID, the METRO Group recorded process success rates of more than 90 percent. The fall 2005 verification of an RFID case study conducted in 2003 by the METRO Group, Procter & Gamble and IBM demonstrated impressive results: the time savings when reconciling the order with the electronic dispatch note can lead to cost savings of up to 2.84 euros for each dispatch note. In addition, there are reduced transportation costs – trucks incur shorter waiting times due to quicker processing. This results in additional savings of up to 5.70 euros for each dispatch note.* Furthermore, inventory gaps can be decreased, because the staff maintains an overview of warehouse inventories at all times. And, last but not least, employees can order goods at the most suitable time – this allows a reduction in warehousing costs.

RFID at the partners' places of business

Sending out electronic dispatch notes, writing transponders, printing labels and affixing them to the pallets – the RFID partners handle all these core processes before shipping the goods to the METRO Group. Many manufacturers such as Heinrich Nölke GmbH also develop and test their own RFID solutions. The medium-size company produces and sells high-quality meat and cold cuts, including the Gutfried brand products. RFID is used to optimize the control of outgoing goods: after order picking, the pallets are tagged with reusable RFID transponders, which include an unmistakable Serial Shipping Container Code based on which the

IT system can categorize data on the content and the name of the distributor. On the way to the loading yard, the pallets pass by an RFID reading device that registers the data stored on the transponder. Before the trucks of the shipping company arrive at the loading dock of the warehouse, an employee logs the vehicles into the system and assigns a gate. Via the customer name, each pallet can be assigned to a truck and a portal for outgoing goods. Monitors show the forklift drivers to which gate they need to transport the pallets in question. In addition, the monitors display information on the number of logistic units included, the sum of pallets for each truck and the list of customers for multiple pallets. This way, the forklift drivers can load the goods more quickly without repeated dismounting and reading of the pallet note. Errors in loading the merchandise can be reduced as well.

Jointly overcoming initial difficulties

Packaging specialist SCA Packaging pursues entirely different ideas. In collaboration with Nestlé, the company is testing the automated tagging of transponders to secondary packaging during carton production. The management expects the integration of this work step into the running production to result in greater efficiency and time savings. SCA has started a pilot project at its Fulda (Germany) based factory. However, Philip Barnes, Supply Chain Development Director at SCA Packaging, still sees a few challenges that must be mastered. At seven percent, the error rate in affixing

At a glance: RFID at the METRO Group

- November 2004: start of the first roll-out phase in the fields of logistics and warehouse management
- Participating retail brands: Metro Cash & Carry, Real, Galeria Kaufhof
- Late 2005: around 35 partners from the consumer goods industry participate in the roll-out

*Source: documentation of the results for the validation of the RFID case study conducted by the METRO Group, Procter & Gamble and IBM, September 2005



Zygmunt Mierdorf and Dr. Gerd Wolfram are pleased with the positive results: RFID accelerates incoming goods processes and delivers significant cost savings.

RFID labels is still too high and he is not yet fully satisfied with the precision in positioning the transponders: some of them still deviate up to ten millimeters from the predetermined placement location. The partners are working at top speed to master these start-up difficulties and to further advance the practicability and efficiency of RFID technology.

A fresh start in 2006 for RFID

In 2006, RFID will once again be one of the top items on the agenda for the METRO Group and its partners. The new RFID year will kick off with the appearance of the METRO Group Future Store Initiative at NRF Retail's Big Show 2006 in New York. It will be the third time that the METRO Group presents itself at this international industry meeting. Together with partners IBM, Intermec, Procter & Gamble and DHL, the company will reproduce an RFID-supported process chain from manufacturer to front store. As part of the convention

program, Dr. Gerd Wolfram, Managing Director of MGI METRO Group Information Technology, will summarize and assess the experiences gained to date by the METRO Group during the RFID roll-out.

This highlight is followed by the participation of the METRO Group in the 2006 CeBIT. In an area of about 2,800 square meters, the Future Store Initiative and its partners will present possible applications of RFID technology in various areas of everyday life. Impressive exhibits will show how RFID can support consumers during shopping, at home and in their leisure activities. In addition, a look behind the scenes will provide insight on how the retail sector uses the technology in the fields of warehouse management and logistics. "The participation in CeBIT underscores our position as the industry's innovation leader. We are the first retailer to present RFID in this form at the world's largest IT fair," said Zygmunt Mierdorf, Member of the Management Board of METRO Group.

Success story at the Varena warehouse

One good example of the successful application of RFID at the warehouses of the METRO Group is the Varena warehouse in Unna (Germany). The distribution center supplies about 60 stores of the Metro Cash & Carry sales division and has 58 portals for incoming and outgoing goods equipped with RFID readers. Finished pallets are tagged with an RFID transponder, which includes data such as the Serial Shipping Container Code and the store number as well as detailed information on the pallet contents. The special feature in this process are reusable transponders. They are not glued to the pallets but integrated into boxes sized about 20 by 30 centimeters and subsequently affixed to the pallets. Once the loading process is started, the reader mounted to the portal for incoming and outgoing goods registers the data, stored on the transponder and transmits them to the warehouse management system. The system checks the data, and the process is concluded if all pallets of a shipment have been correctly loaded. The system immediately notifies the employee in charge of any errors, so they can be corrected in time.



At 99.4 percent, read rates at the Varena warehouse are high. Thanks to RFID, the outgoing goods processes can be run more efficiently. The result is a dramatically reduced error rate. "The Varena in-house solution, which has been used since July 2005, is the RFID application with the highest number of readings and the most reliable process success rate internationally," said Frank Schmid, who is in charge of the project at IBM Business Solutions.

Expanding the application of RFID to the box level will constitute another milestone in the new year. This will open up additional benefits of RFID technology: mixed pallets can be registered more quickly at the portal for incoming goods, and it will be easier for the employees to check and manage warehouse inventories. Supply management between stock room and front store can be optimized, because the staff maintains an overview of the available inventories at all times.

Last but not least, the METRO Group and its partners are planning to convert their systems to the new "EPCglobal Class 1/Gen. 2" standard. This new standard will ensure that readers and transponders are compatible on a worldwide scale. Compared to its predecessor models, the "EPCglobal Class 1/Gen. 2" standard has a greater storage capacity of up to 256 bits. Furthermore, it allows higher writing



Over the course of 2006, the METRO Group will also use RFID at the box level.

and reading speeds: seven transponders can be written and up to 1,000 transponders can be read per second. Efficient encoding technologies provide enhanced security and take into account a variety of additional data privacy aspects.

CeBIT 2006: facts and figures



- CeBIT is the world's leading trade fair for information technology, telecommunications, software and services. It is aimed at an international expert audience.
- At the 2005 CeBIT, 6,246 exhibitors presented their innovative products in an overall exhibit area of 316,000 square meters, and 480,000 expert visitors from many different countries obtained information on the latest developments in the IT sector.
- The 2006 CeBIT will take place at the Hanover fairgrounds from March 9 to 15, 2006. A special highlight awaits visitors in Exhibit Hall 6: for the first time ever, the leading IT trade fair offers a separate Auto ID/RFID area, where the METRO Group Future Store Initiative will also exhibit.
- At stand E50, the leading German retailer will present 2,800 square meters of exhibits featuring the areas food, fashion, leisure, home and logistics. Numerous partners of the METRO Group Future Store Initiative – among them IBM, SAP and T-Systems – will also be represented at the 2006 CeBIT.

RFID COMPACT



>> Logistics award for Zygmunt Mierdorf

For his outstanding commitment to greater efficiency in logistic processes, the Log-IT Club honored Zygmunt Mierdorf, Member of the Management Board of METRO Group: in September 2005, he became the first recipient of the Log-IT Award. The club sees itself as an interface between logistics and IT with the goal of promoting the development of innovative technologies. According to the organization, Mierdorf was selected for the award, because he played a key role in advancing the research and application of RFID technology.

>> RFID makes automotive seats unmistakable

In the automotive industry, the traceability of components is an important issue: during any quality-related incident, manufacturers must be able to identify the affected vehicles quickly and unmistakably in order to implement any recalls efficiently. Grammer AG, which is based in the southern German town of Amberg, uses RFID to clearly label its seating systems and vehicle interiors. The company tags its products right before delivery. If this project is successful, Grammer AG will use RFID technology for additional business processes.

>> RFID in the operating room

As part of a pilot project, the Innsbruck district hospital in Austria will equip four of its 54 operating rooms with RFID readers. Prior to surgery, patients will receive a wristband with an integrated Smart Chip containing an identification number. As soon as the patient passes through the door of the operating room, a reader reads the RFID chip. In a matter of seconds, the stored number is compared to the information stored in the hospital's IT system. As a result, it is possible to identify the individual on the gurney without doubt: if he or she is in the wrong operating room by mistake, the system will automatically sound an alarm.

>> More and more libraries rely on RFID

Since the end of 2005, the city of Amsterdam (Netherlands) has been equipping its public libraries with RFID check-out systems. Visitors can independently check out their books at lending terminals and avoid waiting times. In addition, the media are better protected from theft. During the first phase of the project, RFID chips will be affixed to 75,000 books of each of the 25 municipal libraries. In 2007, Amsterdam's Central Library will also be converted to RFID. Vienna (Austria), Stuttgart (Germany) and the Vatican have been using RFID in their libraries for quite some time now.

>> RFID mobile phone to replace tickets on public transport

The Paris public transport company and the telecommunications provider Bouygues Telecom are jointly starting an RFID pilot project. Beginning in March 2006, 150 test passengers will receive a mobile phone with an integrated RFID chip to pay for their rides on about 800 subway trains and 8,000 municipal busses. When getting on and off, the passenger simply holds his or her mobile phone up to a touchless reader. The price for the distance traveled is automatically collected from the passenger's user account. The mobile phones by NEC are equipped with passive transponders. As a result, the payment system will work even if the battery is empty or the mobile phone is switched off.

"RFID WILL CHANGE THE WORLD."

> Interview with Ernst Raue, Member of the Management Board of Deutsche Messe AG

With more than 6,000 exhibitors from about 70 countries and half a million visitors, CeBIT in Hanover (Germany) is among the world's largest trade fairs for information and communications technology. CeBIT is organized by Deutsche Messe AG. The editorial staff talked to Ernst Raue, Member of the Management Board, about the new "Auto ID/RFID" exhibit area.

What are the reasons for Deutsche Messe AG to devote an entire separate area to RFID?

With the new exhibit area, we are taking into account the current developments in information and communication technology. It becomes more and more apparent that innovations based on RFID will deeply change business processes in the future, especially in logistics. The interdisciplinary "CeBIT Forum RFID" provides consumers and companies with an opportunity to obtain comprehensive information regarding the advantages and benefits of the technology during corporate lectures and panel discussions. In this manner, we will promote the dialog on RFID. It is our objective to establish this offering as an international product and information platform during CeBIT.

What RFID applications will be shown?

Companies such as Höft & Wessel, Psion Teklogix, IND Mobile Daten-systeme or Metrologic display the broad spectrum from mobile computing, time registration and access systems to complete system solutions. At the CeBIT 2006, the METRO Group will be the first retail company to present RFID-based solutions in the areas of retailing, leisure, home and logistic technologies together with its partners.

RFID-related special events at this year's CeBIT

CeBIT Forum RFID

This central information point in the newly added "Auto ID/RFID" exhibition area provides insight into the multi-faceted world of RFID solutions.
March 9 to 15, 2006, Hall 6

The revolution of RFID - challenges and options for action

The European Commission chose CeBIT 2006 as the starting point for a comprehensive public discussion of the risks and opportunities of RFID in politics, society and industry.
European Commission ICT Conference, March 9, 2006, Convention Center

Deploying RFID in Germany - technologies, applications, perspectives

Experts from politics and business will discuss the new technology's potential as growth driver for the German economy. Participants include Gesellschaft für Informatik, the German Ministry of Education and Research, VDE Association for Electrical, Electronic & Information Technologies, METRO Group, SAP and IBM.
RFID-VDE-Forum, March 10, 2006, Convention Center, Hall 3 a



The market for RFID applications has seen tremendous growth in recent years. Will this development continue?

Without a doubt it will. Opportunities exist primarily in those industries that benefit from a high degree of automation. RFID can help accelerate and simplify processes, thereby minimizing identification errors. In addition, the technology improves the information basis for the individual company as well as the entire value chain beyond corporate limits.

Does RFID offer opportunities for the German economy?

Technological progress is key for the competitiveness of Germany as an industrial location – and therefore also for new jobs. During the discussion about RFID, the opportunities for the economy often fade into the background. Consumers are sometimes concerned about the privacy of their personal information in connection with the technology. We should understand the new technology as an opportunity instead of a risk. Politicians could make a contribution in educating the public regarding the security-related and economic potential of RFID – especially in terms of data privacy and consumer protection – and to clearly illustrate the benefits for consumers.

In your opinion, in what way will RFID change the consumer's world?

I believe that RFID technology will become an accepted fact of life for consumers in the future and it will be hard to imagine everyday activities without it. Today, many people already benefit from RFID. Many things are simpler and more convenient with the help of this technology. For example, take the application of RFID on ski passes, gas station cards or electronic immobilizers. RFID will change the world, especially in terms of identification, access control, logistics and security surveillance.



YOU ASK, WE ANSWER

What opportunities does the new testing laboratory at the METRO Group RFID Innovation Center provide?

The RFID testing laboratory of GS1 Germany and the METRO Group offers comprehensive support for all questions related to Radio Frequency Identification to both suppliers and system developers:

- Performance measurements of product-transponder combinations help increase the reading rates. To obtain reliable results, these tests are conducted in a static and a dynamic environment.
- At the lab, companies can use professional equipment to test their own RFID developments. This presents a benefit especially to small and medium-size companies.
- The testing laboratory offers a comprehensive training concept. For example, suppliers can participate in a transponder seminar. RFID experts present the latest developments in the RFID market and provide specific advice. Seminar participants will acquire key knowledge, including how to locate the ideal area for affixing RFID transponders to a pallet.
- On an area of 500 square meters, the test lab provides companies with various test facilities.
- The new RFID testing zone was the first lab in Europe to receive the official title "EPCglobal Performance Test Center" from EPCglobal.

At what date will the METRO Group introduce the new "EPC Class 1/Generation 2" standard?

The METRO Group has already been testing the second-generation RFID transponders since March 2005 at the METRO Group RFID Innovation Center in Neuss (Germany). The results are very promising. In the spring of 2006, the transponders will likely be available in sufficient quantities, so that the METRO Group will accept "Gen. 2" beginning on April 1, 2006. During a transitional period, the company will process both "Gen. 2" and the old standard simultaneously. The METRO Group will inform the suppliers in question in a timely manner.

What is the so-called "RFID Read Rate Reporting"?

In January 2006, the METRO Group will expand its Metro Link supplier portal with a new application. The "RFID Read Rate Reporting" will provide all RFID partners of the METRO Group with information on the read rates of their transponders. If there are problems, the suppliers can identify error sources early on and develop solutions. The "RFID Read Rate Reporting" will make a contribution to the continuous optimization of processes using RFID. The Metro Link supplier portal, which has been online since the end of 2005, serves as an information and communication platform for all partners of the METRO Group.

FACING THE DYNAMICS OF GLOBAL COMMERCE

> Hamburg (Germany) is home to the world's most modern container terminal

Containers are the common denominator. They hold goods that are transported across thousands of miles and multiple oceans to their destination - by ship, rail or truck. Global commerce has grown fast over the past few years. The company Hamburger Hafen und Logistik Aktiengesellschaft (HHLA) has adjusted to this rapid growth. One of the leading maritime shipping companies, HHLA opened the world's most modern container terminal in the south of Hamburg in June 2002.

The Container Terminal Altenwerder (CTA) achieves top figures in area and employee productivity as well as cargo handling. The use of RFID plays a key role in this respect. "There are three main areas of application: access control, generation of the pick-up order and automatic transport management from or to the container site," says Jörg Sabellek, Head of Distribution of the subsidiary HHLA Rhenus Logistics Altenwerder GmbH & Co. KG. Each truck driver regularly returning to the terminal receives a so-called Trucker Card, which is linked to important data such as the driver's name, his company and the license plate of the vehicle. This personal card grants access privileges to the container yard.

The driver's order is registered by a CTA employee. The IT system automatically links the order with the data on the Trucker Card. As a

result, the cardholder is authorized to drive into the corresponding container storage area. Once the driver has reached the container stack in question, he holds the card up to a delivery gate. The system recognizes the order data; subsequently, an automated crane transports the desired container to the truck.



Interview: Dr.-Ing. Armin Wieschemann, Head of Terminal Systems at Gottwald Port Technology GmbH

Your company supplied the automatic guided vehicles - AGV for short - for the Container Terminal Altenwerder. Why do you use RFID?

With the help of transponders that are integrated into the floor, we can identify each vehicle and its location on the grounds. Furthermore, RFID allows us

to determine the exact position to within a few millimeters. This is absolutely necessary for terminal operations. Other systems such as GPS do not work this precisely. Compared to optical guidance systems, e.g. cameras that recognize signs, RFID has the advantage that disruptive factors such as fog, rain, snow, dirt or obstacles in the form of other vehicles have no impact on operations. This way, we can guarantee functionality around the clock.

Where else besides Hamburg are the transport vehicles used?

Overall, we have provided more than 350 automatic guided vehicles since the early 1990s. For example, the Europe Container Terminal in Rotterdam (Netherlands) works with a fleet of 200 vehicles. Furthermore, our vehicles are also used in an Asian steel mill.

Do you see additional applications of RFID in container logistics?

We are using the technology not just for automatic guided vehicles. Unmanned, automated cranes and the so-called wide-span gantries, which are needed for container handling, are also equipped with the technology. The potential of the technology is rated highly for the identification and tracking of containers. What's important is that terminal operators, shipping lines and shipping companies agree on a uniform standard for the encoding of the transponders, as they have already done with regard to the container size. In partial areas of logistics, such as the identification and tracking of trucks, companies are already using RFID.

VOICES FROM THE INDUSTRY

There is another important area in which RFID is used: unmanned transport vehicles carry the containers from the ship to the storage area and vice versa. The so-called automatic guided vehicles (AGV) are equipped with antennae, which communicate with about 12,000 transponders integrated into the asphalt. "A fleet management system determines the optimal route and the transponders show the way," says Gerlinde John, Head of Terminal Development at the Container Terminal Altenwerder.

But where does the system obtain the information into which spot of the approximately 140,000 square meter yard the AGV must place the container? Each container has a history, which lists where it comes from and to where it will continue – by rail, truck, feeder ship or barge. These data are supplied by the shipping line via remote data transmission (RDT) or updated by a CTA employee as soon as a container is delivered e.g. by ship. At the same time, the information is also entered into the database: the system automatically sends a transport order to the automatic guided vehicle, which basically ensures that the container gets an ideal storage place in view of its continued transport.

Currently, the containers themselves are not yet equipped with RFID transponders, which would guarantee automatic data transfer. "There is no international standard yet that would ensure data quality and therefore reliability," Gerlinde John said.

During the next few years, HHLA will invest more than 800 million euros in the expansion of its Hamburg container terminal. Additional funds will also be spent on the development of warehouse and contract logistics. In direct proximity to the Container Terminal Altenwerder, HHLA Rhenus Logistics GmbH & Co. KG is currently constructing a new logistics center with an overall storage area of 42,000 square meters. "As far as the RFID standard is concerned, we will be prepared for it," Jörg Sabellek said.



DCS & Labelling Worldwide

Klaus Horn



[Sales Specialist RFID and Print & Apply Systems, Sato]

You are one of the Gold Partners of the METRO Group Future Store Initiative. How are you involved?

As a partner of the Initiative, we collaborate with numerous suppliers of the METRO Group. We develop solutions for the working conditions at the manufacturers' places of business. Examples include the FlagTag Solutions™ and the fully automated RFID labeling system. The transponder is affixed in such a manner that it freely sticks out from the pallet like a flag. This way, we also achieve optimal reading results for liquids and metals. We exhibit our products at the METRO Group RFID Innovation Center, so that other companies will also be able to benefit from our experience.

In your opinion, which areas will benefit most from RFID technology over the next few years?

There is certainly great development potential for RFID in logistics, e.g. when it comes to transporting merchandise shipments for retailers. RFID will make it possible to automatically check incoming and outgoing goods and to accelerate processes. This saves time and costs. The same applies to reusable transport containers, which are often used in the pharmaceutical or automotive industry. In contrast to the barcode label, the companies need to affix the transponder to the containers only once. Subsequently, the chip can be rewritten as many times as necessary.

Last year, Sato participated in the security measures at the World Youth Day in Cologne (Germany): which products were used?

We equipped the security staff at the concluding event with RFID wristbands for identification, which allowed the organizers to efficiently control access to the various security areas. At any point in time, the individuals in charge were able to maintain an overview of how many persons were on duty at the various locations, which made coordination with the police, the firefighters and the technical aid organization Technisches Hilfswerk much easier. In addition, the system provided perfect billing information for the contractual partners.

TRADE FAIRS AND CONVENTIONS

Food & Livestock Traceability

February 1 and 2, 2006 _ Dallas, Texas

The traceability of food and livestock takes center stage at this convention in the United States. Participants from about a dozen countries will discuss how companies can implement legal regulations in this area more efficiently - e.g. based on the use of RFID technology. Representatives from both the business and political arenas will present successful case studies from Japan, Botswana and Australia, among others.

IDTechEx
www.trackingfood.com

Fruit Logistica

February 2 to 4, 2006 _ Berlin

Fruit and vegetables are highly sensitive fresh goods that pose considerable demands to logistics management. Therefore, besides the produce, this trade fair also highlights the technical expertise required in fresh food logistics. Solutions shown by the METRO Group will include an Information Terminal allowing exact tracing of fruit along the supply chain.

Messe Berlin GmbH
www.fruitlogistica.de

EuroCIS 2006: IT and security technology for the retail sector

February 14 to 16, 2006 _ Duesseldorf

One year after EuroShop 2005, Duesseldorf hosts the next important event in the field of IT and security technology. EuroCIS is a compact trade fair forum for the retail sector during which experts from Germany and all of Europe exchange ideas regarding the use of new technologies. This year, about 5,000 visitors from more than 20 countries are expected to attend the event. For the first time, the Global Retail Technology Forum will take place at the same time as EuroCIS.

Messe Duesseldorf
www.eurocis.com

CeBIT

March 9 to 15, 2006 _ Hanover

The METRO Group is the world's first retail company to exhibit at the 2006 CeBIT. This year, "Auto ID/RFID" will be one of the focus topics at this globally leading IT trade fair. The METRO Group Future Store Initiative will welcome both experts and interested consumers to its 2,800 square meter exhibit area. Together, the partners will present RFID applications for logistics, retailing and private households.

Deutsche Messe AG
www.cebit.de

PUBLIC DEBATE

Grand coalition - focus on innovation

The German government intends to expand funding for innovative technologies, as was stipulated in the coalition agreement of the CDU/CSU and the SPD. "Only at the pinnacle of scientific and technological progress will our country, which is low in natural resources, be able to preserve its future prospects," reads the preamble of the coalition agreement. The governing parties aim to increase the proportion of spending on education and research by private companies, the federal government and the German states from currently 2.5 percent to three percent of the gross domestic product (GDP) by the year 2010. In comparison, the countries of the European Union invest about two percent of the GDP in this area. With its "High-tech



Strategy Germany" action plan, the German government especially supports high-tech and cross-sectional technologies, which include biotechnology/life sciences, materials research, systems engineering or information and communications technologies. Beyond domestic borders, the German government strives for a key role in European research policy. In their coalition agreement, the political parties stipulate that they would like to use the EU council presidency during the first half of 2007 to underscore "research and innovation as the key to growth and prosperity" on both a domestic and European scale.

EFFICIENCY AS A FACTOR FOR SUCCESS

> Wal-Mart and the University of Arkansas presented a new study: "Does RFID Reduce Out-of-Stocks? A Preliminary Analysis"

Passive RFID transponders are used in the supply chains of many companies worldwide, but in which areas can the economic benefit of the technology really be proven? The authors of this study assume that RFID applications primarily increase the efficiency in inventory management in a measurable fashion. Currently about 25 percent of all out-of-stock situations in the United States are considered "falsified": the products are available at the warehouse but unavailable to customers on the sales shelf. In these cases, buyers usually purchase a competitor's product or go to a different store. As a result, U.S. retailers and their suppliers lose an average of 3.4 percent and 2.6 percent respectively in sales.

In light of this situation, the world's largest retailer, Wal-Mart, commissioned a study of merchandise availability in 24 stores. The result: when inventory control is supported by RFID systems, out-of-stock situations occur much less frequently. Suppliers, retailers and customers all benefit from this effect.

Identifying inventory gaps in a timely manner

The study was planned for seven months. During this time, the employees recorded on a daily basis how many items were out of shelf. The authors of the study distinguished between test stores based on how extensively RFID technology was used in generating inventory lists: at some stores, lists were generated completely based on RFID, while the technology was only partially used at others. Some stores produced their lists entirely without the help of RFID.

In the twelve test stores with complete RFID support, pallets, boxes and individual items were equipped with RFID transponders. Readers at the warehouse entrance and at the transition points to the front store registered the goods' pathway. The reconciliation of these data with the information of the merchandise management system enabled the automatic generation of inventory lists.

The second group included stores in which RFID systems provided only partial inventory management support for the employees. At the stores of the third control



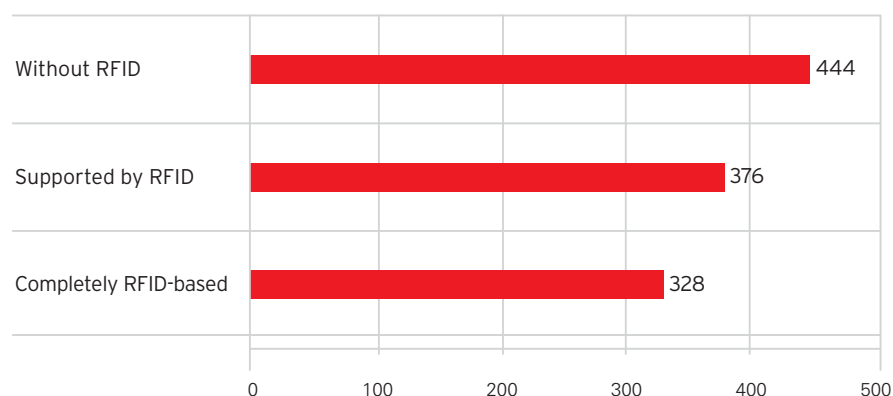
The study can be ordered in English at <http://itrc.uark.edu>

group, the staff managed inventories conventionally without any RFID technology: they personally checked the shelves and generated lists with the missing products – a very time-consuming process.

Significantly improved availability

In their evaluation, the authors started by comparing the number of out-of-stock situations at the various test stores. In addition, they examined the reliability of traditional and automated inventory lists as well as the availability of individual products with and without transponders. In all three cases, RFID provided significant improvements. For example, the number of sold-out items was down 16 percent at the stores that generated their inventory lists with RFID systems. Furthermore, the items without RFID transponders were out of stock three times as often as products with Smart Chips. These results clearly demonstrate the benefits of RFID.

Average weekly out-of-stocks by treatment - test stores

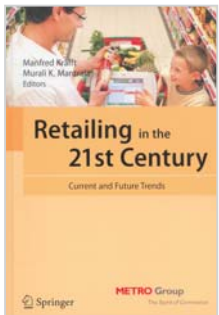


Source: Sam M. Walton College of Business, University of Arkansas, 2005

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> Retailing in the 21st Century

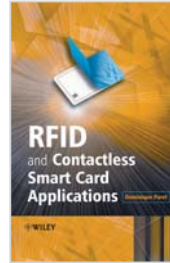
The intense competition of different distribution formats, the increasing significance of e-commerce, the potential associated with new technologies such as Radio Frequency Identification and the international expansion of large retail companies – these are just some of the traits that characterize today's retail landscape. For both retailers and analysts, it is equally important to correctly assess these factors and make use of them in a meaningful manner. Help in this respect is provided by the book "Retailing in the 21st Century" published by Manfred Krafft and Murali K. Mantrala. This compendium combines contributions by German retail practitioners and renowned scientists from all over the world to form a comprehensive pool of knowledge about modern retailing. Dr. Gerd Wolfram, Managing Director of MGI METRO Group Information Technology, has contributed an article dealing with the impact of new technology on modern food retail.



Manfred Krafft, Murali K. Mantrala
(eds.)

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> RFID and Contactless Smart Card Applications



Dominique Paret

John Wiley & Sons, New York

Today, experts discuss RFID applications they could not even conceive of a mere ten years ago. The technology has evolved rapidly and the supply of technical literature has barely been able to keep up, which is the reason Dominique Paret wrote the book "RFID and Contactless Smart Card Applications." It provides a systematic overview of the current situation of Radio Frequency Identification. The theoretical and technical basics of RFID as well as the topics of standards and security take center stage. The author explains the structures and functions of all components of RFID systems – from antennae to transponders and software. Detailed practical application examples illustrate the information. RFID expert Dominique Paret works for Philips in France as a technical support manager in the "Innovation and Emerging Business" division. He represents the company in various national and international standardization organizations.

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