University of Nebraska-Lincoln

RFID Newsletter

August 2004

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Inside this issue:

Message from the Organizer

Erick Jones, Ph.D.
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Welcome to the inaugural issue of our RFID newsletter. This project represents an effort on our part to educate business owners, researchers, and consumers and general as to the realities of RFID technology and clear out some of the rumor and guess work from the process of selecting, designing, and implementing RFID systems. So often with this emerging technology, a company promises a result on paper which can not be resulted in the field. Half the time, the "exciting new developments" in the RFID world are in fact nothing more than vapor ware or a theoretical piece of technology that has yet to be developed. Our group's mission has been from the beginning to clear some of this fog of misinformation and get down to what is really available to the average customer.

In this issue we take a look at some new developments on the RFID technological front, from it's applications in security systems to file management at 3M. We also take a look at some articles recently published dispelling the illusion regarding implantable RFID technology and its impact on issues of personal security and privacy. We also take an in-depth look at a new RFID reader released by ThingMagic corporation that promises to expand the RFID world by providing something that many readers do not: the ability to read many different tags from different producers. Finally, we examine the circumstances surrounding the departure of Symbol Technology's CEO Bill Nutti and the effect this will have on their corporation, who manufacture the various MATRICS RFID products which many business owners have already implemented within their organization.

Dr. Erick Jones

Editor's Corner

Adam Rogers
University of Nebraska-Lincoln

This newsletter is intended to be used as a source of information regarding new innovations in the world of radio frequency identification, or RFID. Developments in technology, business application, and public appearance have led to a dynamic and ever-changing world of RFID for the common business owner which can be difficult at best to keep track of without organization and hours of reading journal articles. Toward this end, we at RfSCL have created this newsletter which will allow for a perusal of article summaries from the cutting edge of RFID technology. For more information regarding these or any other aspects of RFID, feel free to contact us, and we will be eager to forward you complete transcripts of articles or any other RFID consultation you may require.

Adam Rogers

RfSCL Profile

Imagine, when you get off of the airplane and find out your luggage is not at baggage claim, you can use your cell phone to track and find out which airport your luggage has been accidentally sent to. Or, while checking out at the supermarket, you could need only to pass your cart through the lane to have all items contained within it rung up and ready for purchase. This dream and many others are quickly becoming reality using the revolutionary Radio Frequency Identification (RFID) technology.

Previously, RFID was only tested in research labs and studied by large organizations for good advertisement. But, the improvement in this technology has come to a stage were retailers like Wal-Mart and manufacturers like Gillette are planning to implement this technology into their supply chain by early 2005.

Now researchers are trying to get this technology to a level where common users need not worry about privacy issues and small businesses can afford it.

To reach this level of trust and economize the RFID technology, the department of Industrial and Management Systems Engineering at the University of Nebraska-Lincoln has created an RFID and Supply Chain Logistics (RfSCL) Lab.

This Research facility will devote itself to performing high quality research on RFID technology and Supply Chain Logistics.

Through our implementation of high quality research combined with Six Sigma methodology, we at RfSCL provide an opportunity for business owners as well as private investors and research grant providers to initiate progress in the field of Radio Frequency Identification. We provide applications results which are accurate, reliable, and immediately useable for business applications.

Current RfSCL Projects

-Work is continuing on a series of articles detailing recently completed projects with the National Aeronautic and Space Administration, NASA, to implement RFID systems aboard the International Space Station for purposes of inventory tracking. RfSCL tested Commercial Off The Shelf RFID products for feasibility to perform as required under the unorthodox environment of the ISS.

-Additionally, several other articles are being prepared for publication on a variety of subjects, including but not limited to: Implementation of Six Sigma Methodology to Governmental Organizations, Comparison of Performance between bar code systems and RFID systems for inventory tracking, and various other logistics projects.

-An RFID simulator designed internally within the lab is undergoing finalization stages to ensure it is ready to meet the needs of customers who require a fast, efficient method of educating their employees about RFID. This will be made available to the general public sometime soon in the foreseeable future.

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moving at 600 feet per minute in 12 milliseconds (in controlled, simulated situations). The addition of this capability was again driven by demand from customers with an eye towards scalability. "If you are the VP of supply chain, you can't ask that your conveyor belt be slowed down to accommodate the RFID reader's speed," noted Ashton. Instead, ThingMagic hopes that the reader upgrade will exceed the "very high bar of performance" necessary to ensure that the RFID deployment does not itself become a pain point and that it can scale across an enterprise's fast-moving supply chain.

The upgrade also expands the number of tags supported, with the most significant development being full support for all of the Matrics Class 0+ capabilities (previously, the Mercury4 could not utilize the tag's kill and lock capabilities). The upgrade is included in the cost of the standard Mercury4 license, so those customers whose license is current can upgrade at no additional cost. Consistent with the company's belief in "software defined radio," the upgrade to the readers is purely a software upgrade; no hardware modifications or field workers are necessary. Already deployed Mercury4 readers can be "upgraded remotely," said Ashton. "It takes 60 seconds to do it across the whole network."

VeriChip Corporation Introduces Its New Wearable / Implantable Security Solution - VeriGuard(TM) - at Security Tradeshow in Girardot, Colombia

DELRAY BEACH, Fla.--(BUSINESS WIRE)--July 27, 2005--

VeriChip Corporation, a subsidiary of Applied Digital (NASDAQ: ADSX), a leading provider of security and identification technology, announced today that it is introducing its new implantable / wearable security solution - VeriGuard(TM)- at the 14th National Congress of Private Security

Exhibition in Girardot, Colombia, the private security industry's premier tradeshow in Colombia. The show starts tomorrow and runs through July 29. The website for the Colombia National Congress of Private Security is http://www.andevip.com/.

With the Company's recent acquisitions, the VeriGuard system now features both implantable and wearable RFID access control and monitoring technology. Implantable RFID chips and/or wearable RFID bracelets and tags integrate seamlessly into the new VeriGuard system.

Commenting on the launch of the VeriGuard system, Kevin McLaughlin, Chief Executive Officer of VeriChip Corporation, stated, "This introduction marks the continued integration of our implantable and external RFID products for people. Our first-of-a-kind implantable RFID chip - VeriChip - can be used for access control and other security applications. Our recent acquisitions allow us to offer similar RFID technology that is external rather than internal. In one cohesive solution, we can now offer the end-user a choice of tamper-proof, secure, implantable technology or easily removable yet accurate external technology."

The exhibition and demonstration of the VeriGuard system will be managed by Seguridad Oncor, VeriChip's distributor in Colombia.

RFID Spells On-Demand

In an age long before computers, when Henry Ford first began assembling cars, frames were placed on sawhorses lined up and down the center of a plant. Assembly line workers delivered parts from chassis to chassis installing one part at a time -- tires, fenders, doors and many more. Improvements, like a rope and winch system, sped up the assembly line process. And within five years, the time it took to build one car was reduced from hours to minutes. The significance of this invention to business and society wasn't necessarily the automobile, but the improvements in transforming a manual assembly line to an automated manufacturing process. Soon thereafter, innovative pioneers in other industries adopted the same techniques

Today, nearly a century later, new technology innovations are offering equally radical ways to transform business processes like factory assembly lines. IBM, for instance, has transformed a 140,000 square-foot manufacturing building in East Fishkill, New York into the world's most advanced semiconductor manufacturing facility. It uses 300-millimeter (300mm) wafers to produce customized chips for everything from cell phones and video-game consoles to central processing units. Like the invention of the car, the invention of these products is changing the world.

But that's only half the story.

The "sense and respond" factory is one of the world's earliest examples of the transforming power of Radio Frequency Identification technology. It takes advantage of the latest innovations in wireless computing to automate assembly lines and supply chains by integrating the physical world of devices, computers, sensors and machines with business process applications.

Engineers used to read the labels on wafer carriers and then physically transport them to the appropriate tool stations, a process that resulted in costly errors such as the transposing of carrier ID numbers. In addition to eliminating such errors, IBM wanted to offer clients real-time visibility into their orders and shipments during different phases of the product lifecycle (which includes design, manufacturing, testing, packaging and delivery).

Addressing those needs, RFID readers were integrated into the plant's production tools to track its supply chain of wafer carriers, each of which can contain up to two million dollars worth of finished products. As a carrier moves along overhead tracks to different fabrication stations, the readers scan the carrier's tags to validate its location and instruct the tool to perform the required production steps. The nonstop plant automatically controls all aspects of the fabrication process, from managing product specifications to prioritizing jobs to transporting wafers between tool stations. Wirelessly accessible data allows employees to monitor the production line.

Today, errors are all but eliminated and employees can provide clients with timely, detailed manufacturing and shipment reports, and place orders for new parts based on real time visibility of inventory levels. Blending innovative technology approaches like Sensor and Actuator Solutions with new business methodologies like Product Lifecycle Management, IBM is helping factories transform and automate business processes to gain real time visibility of supply chains. IBM calls this approach Business Process Transformation Services, (BPTS).

We've come a long way from using a rope and winch system to assemble the automobile in the last century, to a new era of the on demand e-business factory. And it will be the early pioneers that deploy Radio Frequency Identification technologies in the coming years that will be the best positioned to gain a competitive advantage in their industries that may well endure throughout the 21st century.

Chip Implants: Better Care or Privacy Scare?

They're here. They have FDA approval. But are Americans ready to get chipped?

Getting chipped means having a radio frequency identification (RFID) chip implanted in your body. The chip -- about the size of a large grain of rice -- lies dormant until a special scanner is passed within 6 inches of the implant. Then it emits a radio signal that beams a 16-digit number to the scanner.

For security uses, that 16-digit number acts like an electronic key. For medical uses, the number is linked to medical records. Doctors to whom you've granted access -- emergency room doctors, for example -- can use the key to quickly get hold of your medical records.

Who would want such a thing? That depends on how you ask, says Scott Silverman, CEO of Applied Digital, which makes the FDA-approved RFID called VeriChip.

"When we first announced VeriChip, a network poll asked people if they would put one in their bodies," Silverman tells WebMD. "Only 9% said yes. After FDA approval, 19% said yes. When former HHS Secretary Tommy Thompson joined our board, the rate went up to 33%. But our own study shows that if you ask people whether they would have a VeriChip implant to identify their medical records in case of an emergency, the positive response goes to 80%."

The chip got FDA approval in October 2004. Since then, Silverman says, some 2,000 people worldwide are using them for medical or security purposes. But soon he expects that millions of people will get VeriChip implants every year.

3M and the Appeal of RFID File Tracking

3M, maker of such household brands as Scotch tape and Post-it notes, last month announced that it had been awarded a five-year contract from the U.S. General Services Administration (GSA) for 3M RFID File Tracking Systems. The contract means that 3M will enjoy streamlined access to selling its RFID file tracking services to federal agencies. Dave Sayers of 3M's Security Systems Division said, "This GSA contract is another milestone in the growing emergence of RFID for applications such as file tracking, and the recognition of 3M as a pioneer and leader in this technology."

Sayers appears to be right. While most other companies have gone after the supply chain segment of RFID, 3M has positioned itself to be the leading solution provider of RFID-based file tracking systems, targeting the government, law offices, accounting firms, and other fields whose physical record-keeping needs are paramount. Lost, misplaced, or stolen files in fields such as those can result in significant financial and productivity losses. File-tracking systems therefore offer quantifiable benefits and in many cases attractive near-term ROI. (The 3M site has some relevant case studies.)

Given the demonstrable ROI and the potential market opportunity (consider the quantity of lawyer, doctor, government and accounting offices), the question is why more RFID companies haven't targeted this space. There appear to be three answers. First, the technology is not easy, according Bob Scher, CEO of Dynasys, an RFID services firm that offers a file tracking product. Given the particulars of tagging stacked paper, "it is

dly admitted.

Bill Nuti is correct in saying that Symbol's problems ran far deeper than "book cooking". The problems created by management errors that pre-dated Nuti's arrival were substantial. Nonetheless, during Nuti's roughly three year tenure at Symbol, and especially during the two years when he had free reign, it became evident that he failed to grasp the root cause of Symbol's problems, the fundamentals of the ADC-ITP business, and the dramatic changes the ADC-ITP industry was undergoing. And, unlike the set of missteps he inherited, Nuti's missteps are arguably far more irreversibly devastating to Symbol.

The stark reality is that Nuti left Symbol in far worse shape than it was when he arrived on the scene. He left after putting Symbol's core business in serious jeopardy, and possibly created another scandal.

WCCN takes great umbrage at what Nuti has done to the firm that contributed so much to the advancement of enterprise automation. We are of the strong opinion that it does not well-serve the industry to have a crippled Symbol. And, many a Symbol competitor would concur.

Extricating Symbol from its disaster trajectory will require replacing Nuti with a well-qualified and talented executive who understands enterprise automation, and ideally has ADC-ITP experience. The worst selection would be to choose another self-proclaimed turnaround manager. But, it may well be near impossible to convince a well-qualified executive to accept the assignment -- especially given Symbol's diminished technology leadership role.

Compounding the problem is that selection of Nuti's replacement will be made by Symbol's Board of Directors, presumably with advice from Symbol's executive staff (all of whom were selected by Nuti, and have no experience-earned knowledge of the ADC-ITP industry.) Yet, unless a Gerstner-type, or one of the only three in-industry qualified executives accepts the challenge, arguably, the prudent action would be for Symbol to adopt the “Symbol Retirement Plan” as described in the August 2005 issue of *The WCCN Letter*. The plan isn’t what you might think. But arguably it may be the only viable *Last Chance* left for Symbol.

Seven pages of the August 2005 issue of *The WCCN Letter* are devoted to a clinical, in-dept review of the pre-Nuti & post-Nuti problems at Symbol, leading to the *Last Chance* conclusion.

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