

RFID Applications

The future holds RFID Applications that go far beyond mere bar coding. The world will be a different place once readers and RFID tags are everywhere.

Q: “What are some of the untapped applications for RFID that we may see in the foreseeable future?”

By Victor Vega, Alien Technology



UHF RFID has matured to a point where “it just works.” The days of never ending pilots are behind us, and the industry is squarely in an explosive growth stage. Consumable tag pricing is very attractive, but more importantly, reliability features, performance, global acceptance, and multiple sources as well as numerous solution providers are extensive. Applications have always been abundant, but now they are being realized and deployed. So in many respects, nearly all RFID opportunities are “untapped.”

Item level tagging is in full swing with the dominant application being retail apparel. Other item level initiatives include tracking applications such as airline baggage, blood bags, consumer electronics, electronic vehicle registration and automated toll collection, health care assets, file management, identification and loyalty cards, library books, pharmaceuticals, ticketing/event management, triathlon participants, etc., etc. The list is extensive and the potential is enormous. Apparel is initially being deployed to gain inventory management efficiencies, namely in the backroom and on the display shelf where continuous and automated inventories can be conducted. For the consumer, the benefit is ensuring the desired size/color/style is always available and on the shelf. For additional customer service, an interactive touch screen may confirm items of interest are on a discount table vs. pilfering through piles of clothing.

Today, retailers attach EAS tags (Electronic Article Surveillance) to items to detect whether an item has been potentially stolen. However, these security devices have no identity, so they cannot convey what item is alarming the system. RFID has the potential to extend beyond supply chain and inventory visibility, providing a dual

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purpose with additional detailed information about a potentially stolen item. If the alert identifies a 40" LCD TV, it would be easy to isolate the potential culprit.

Additionally, high-end fashion is using RFID to help curb counterfeits and to address gray-market activity, ultimately leading to brand dilution and ASP erosion. New anti-counterfeiting features provide suppliers and consumers with enhanced confidence that the products are authentic.

As item level applications emerge, so will the consumer support infrastructure. Albeit short range, cell phones of the future will have the capability to read RFID tags. If a consumer is a subscriber to an on-line "best-buy" purchasing & rating service, they may scan an item (for example a 40" LCD TV), and the service could provide specifications, model comparisons, or perhaps recommend a higher rated option at a potentially lower price.

As e-pedigree initiatives take hold, tagged pharmaceutical drugs will have multiple benefits to the consumer, not only will illicit counterfeiting activities be curbed with the electronic drug pedigree, and provide the consumer with an enhanced level of confidence that their medication is not a placebo, but for the elderly with impaired vision and memory, a RFID pill bottle appliance retaining a dozen prescription drugs, e.g. where six for Henry and six for Helen may be intermixed, and the appliance will appropriately illuminate/beep when it's time for medication.

For example, at noon, a blue LED in the appropriate slot blips continuously in sequences of two to inform Henry that it's time for two high blood pressure pills, and at 3:00 pm a pink LED in the appropriate slot blips continuously in sequences of one to inform Helen that it's time for her single cholesterol dose. The apparatus is networked, so concerned remote family members, and the physician, can insure proper attention is being paid to the medication.

Today, applications include high speed monitoring of professional motorcyclists, monitoring motorbikes at speeds in excess of 140MPH. At these speeds, plenty of performance margin exists to extend the technology to automated vehicle toll applications, in lieu of the more expensive legacy battery powered systems. Such deployments are taking root across the globe.

In summary, the applications have always been discussed, now action at the item level is expanding at record levels, across numerous vertical application markets.

By Dave Kohlmier, Mentor Graphics Corporation

In truth, this is the old "iceberg" question as more of the market is certainly untapped than tapped at this time. Many of those untapped applications are logical evolutions of current applications, anticipating technological advancement and market acceptance to make them practical.

Much of the foreseeable future use of RFID will be in tracking and inventory management applications. These have a foothold and appropriate ROI exists for this market to grow rapidly. Shoppers will be able to simply walk through a checkout

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with little more than a pause.

RFID tags in the items will automatically be received by the point of sale (POS) system and totaled; the customer's ATM or credit card will have its RFID scanned to pay for the items. In addition, the store's security system will make sure that nothing is being stolen, and if it detects any theft, it won't just trigger an alarm, but let security know what the product is ("red cardigan sweater") and where it is ("Exit 4").

Airline baggage will be tracked and routed with RFID tags. The system will automatically sort and route baggage to the proper aircraft or carousel. The medical industry will also benefit greatly. Pharmaceuticals will be tagged for inventory as well as dosage control. Laboratory specimens will be tagged to virtually eliminate any possibility of patient identification error. Surgical patient ID bracelets will be identified by RFID to ensure the patient receives the proper treatment.

While these "untapped applications" are known at this time, problems exist that will require solutions in order to bring these markets to full fruition.

For example, metal can shield, reflect, or otherwise interfere with RFID. Yet many, many applications will require RFID tags to be affixed to metal objects, or to operate within close proximity — even touching — metal. Other substances can cause interference or attenuation that render RFID mute as well.

Solving these problems to satisfy the demand for those untapped applications will require designers to use high-powered simulation tools, such as Mentor Graphics IE3D, to identify and solve these and other problems in the laboratory to realize commercially suitable designs. In short, the untapped applications are not unknown; getting today's technology to tomorrow's applications requires R&D, simulation and development tools, and well-designed products.

By Rom Eizenberg, Precyse Technologies



RFID found its roots in the post WW II technology boom driven by fighter pilots' need to identify friend from foe. Since then, RFID application scenarios are seen in various industries within two product categories: passive and active RFID. Passive technology provides an automated way for organizations to capture product identification codes, but it's the battery-powered, active RFID products that hold the most promise to change the way we live in the future.

The past 10 years allowed for the perfection of the technology and the development of case studies for the use of asset networks in supply chain

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management, security and other applications. Today, we are standing on the brink of the third digital communication revolution. The first was the cellular age which enabled global voice communication anywhere, anytime. The second is the age of the Internet where information has become readily available, frequently for free, to anyone with access to a computer or a cell phone. This third revolution will bridge the last physical gap between things (inanimate objects, physical assets) and the existing global communication infrastructure. These new asset networks will allow sensor-enabled physical objects — home appliances, products in a factory and cars in a city — to talk to one another, to people or to computers.

Active RFID tags can be described as “cell-phones” for assets. Over recent years, supply chain applications in healthcare, manufacturing and logistics have been driving growth in the industry. We will see a shift into wider area deployments in consumer markets, as everyday devices become intelligent, gaining the ability to communicate with users and systems over the Internet. Traffic congestion will be solved by allowing commuters to see traffic patterns as cars report their presence on a highway in an anonymous way, people can save energy by allowing smart homes to turn off the air-condition in a room when they leave their house, and bridge collapses can be prevented by the use of smart, wireless sensors that continuously measure material strength. It is these mass market applications that will lead RFID’s growth in the future, making the vision of an Internet of Things a reality.

By Vivek Khandelwal, Verayo



RFID technology has been around since World War II. Of course, the form-factors of RFID devices were much different back then, as was the cost. Only in the past decade have the form-factors and cost of RFID devices become interesting and began inspiring new applications.

Phase 1: Wal-Mart Phase

Championed by Wal-Mart, the initial phase of RFID focused on supply chain applications. The central RFID technology was long read range (UHF) RFIDs. Wal-Mart and many other companies looked at these UHF RFIDs to track goods at various points in the supply chain – from manufacturers’ warehouses, to distribution centers, to wholesalers and finally to the retailers’ backrooms and store fronts. The objective was to reduce costs in supply chain operations. While the initial hype eventually died down, there are now pockets of interest again and Wal-Mart

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remains the biggest promoter of the technology.

Phase 2: NFC Applications

A new phase of RFID applications is focused on consumers. The focus is not on reducing costs, but rather growing revenue by influencing consumer behavior. The central RFID technology here is Near Field Communication (NFC), another name for proximity read range RFID. What makes NFC even more interesting is the integration of this technology in mobile phones. NFC applications are all about gaining access to services when a consumer is in proximity to the enabling touch-point. With mobile payment applications, for example, the phone becomes the electronic credit card. With mass transit tickets, the phone becomes the transit ticket or pass that is read by the transit turnstile. Another set of emerging applications entails the phone acting as the NFC reader that reads tags on such items as smart posters, smart product labels and coupons, offering consumers discounts, points or information.

NFC technology has benefits in store for all constituents – consumers, businesses, mobile network operators (MNOs) and phone manufacturers (OEMs). NFC will make our daily lives as consumers of various products and services easy and efficient. Moreover, NFC will allow businesses to connect with consumers in ways not possible before. Just like the smart phone, NFC will open opportunities for MNOs and OEMs to sell new phones with even more capabilities, providing value-added services above-and-beyond what exists today.

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