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Physical and Psychological Barriers to RFID Adoption

Two of the biggest complaints I hear from end users regarding passive ultrahigh-frequency (UHF) radio frequency identification systems concern tag reads—whether they're using handheld or fixed readers to monitor inventory on shelves, or to track pallets of goods. On one hand, apparel retailers,

warehouse managers and other end users tell me the biggest problem they have is that readers pick up tags they don't want to read at that particular moment. On the other hand, many are concerned that they might miss reading a tag, and that inventory or shipments might thus be inaccurate.

Unwanted tag reads is a legitimate problem. Concern about missing tag reads is more a matter of education, so let me address that issue first.



There is still a widespread belief that bar codes are more accurate than RFID, because each time a person picks up a tag and scans it, the bar code is read, and we all know there are times when RFID tags are missed. But the reality is that in many situations, the technology is far more accurate than bar codes. The University of Arkansas' RFID Research Center studied employees taking inventory with bar codes and with RFID in an apparel store, and found that workers missed, on average, approximately 20 percent of items, while RFID was 99 percent accurate.

Apparel is RF-friendly, of course, so accuracy is not difficult to achieve. But I've spoken with end users who have deployed RFID to track returnable containers, metal roll cages, metal products and so forth. They tell me that properly engineered passive UHF systems deliver 98 percent accuracy, and that the reliability of their systems quickly convinced them that RFID is a big improvement on their legacy data-collection systems. (The reality is that people armed with bar-code scanners rarely do as well.)

People are comfortable with bar-code systems, because when someone points a scanner at a bar code, the system doesn't beep until the bar code is read. With RFID, there is no such ability to confirm that each individual tag is read. Still, I think it's just a matter of time before people begin to trust RFID. Those end users who use the systems usually wind up trusting the technology.

The issue of interrogating tags you don't want to read is a real concern, and one that I believe hardware and software companies are working hard to address. In warehouses, for instance, companies would like to be able to pick up a pallet and read the tagged goods on the pallet. Instead, they find that as a forklift truck drives down an aisle, the reader picks up tags on pallets in the racks. I know of one major retailer that complained that when employees tried to take inventory of specific items on a particular rack using a handheld, they ended up reading items on nearby shelves as well.

Currently, systems integrators are deploying a variety of methods to solve this problem. They use shielding to prevent extraneous reads, power down a reader antenna's output to limit its range, or utilize software algorithms that determine the proper tags to be read by the number of times the tag responds, as well as the signal strength of that response. But these workarounds turn every RFID installation into a custom solution that is more expensive and complex than end users would like.

This is not an issue with passive high-frequency (HF) tags, because the nature of the way HF tags and readers communicate makes it easy to control the read field and avoid extraneous reads. It's also not an issue for active systems, because active tags are usually placed on a few large objects, rather than on a lot of smaller objects in close proximity to each other.

If—or when—this issue with passive UHF systems is solved, I

think it will make deployments less complex and costly, and make it easier for end users to adopt the technology. And the RFID company that solves the problem most effectively could wind up in a very strong position in the marketplace. Meanwhile, *RFID Journal* will continue to try to shatter the myth that bar codes are more accurate than RFID.

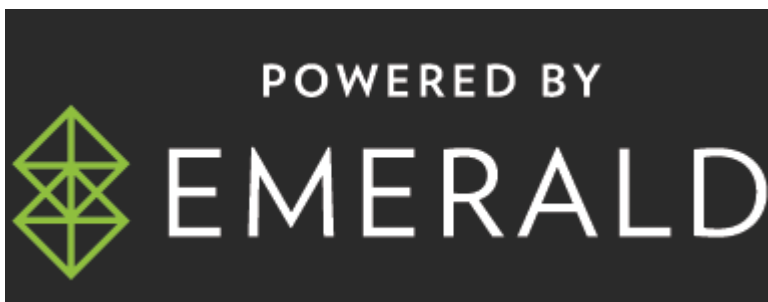
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