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Managing Big (RFID) Data

EXPERT VIEWS

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Retailers tracking unique items via radio frequency identification are concerned about how to take advantage of all the data they collect. A recent MIT-sponsored event began to address this issue.

TAGS ▸ ASSET TRACKING | EPC TECHNOLOGY | RETAIL | SUPPLY CHAIN

Nov 19, 2012 There is a lot of talk these days about Big Data. The term refers to a collection of data so large and complex that companies cannot process it all using existing database systems. Think Google, Facebook and Linked-In. Retailers that are among the first to deploy radio frequency identification solutions to track individual items are learning what Big Data is all about. And that's why in February, Joe Andraski, who at time was serving as president of the Voluntary Interindustry Commerce Solutions VICS and championing the VICS Item Level RFID Initiative (VILRI), asked the MIT Auto-ID Labsto organize an event focused on "what to do with item-level RFID data" generated by the initial rollouts in the retail apparel industry.

In collaboration with VICS, GS1, the Massachusetts Technology Leadership Council's Big Data Cluster and the MIT Industrial Liaison Program, theAuto-ID Labs Big Data Conference and Startup Challenge was held on Oct. 9-10 at the Massachusetts Institute of Technology. The event brought together MIT thought leaders, cloud-computing providers and technology leaders from large retailers, to address how to harness the plethora of data being generated for omnichannel retail and mobile retail commerce applications.

Why is processing item-level bar-code and RFID data and mobile retail consumer data a challenge?

First, there is the issue of a common registry and identifier namespace. While the Internet employs a common Domain Name Server (DNS) and unique Internet Protocol (IP) addresses, companies often have difficulty agreeing on a common registry for items designated with an Electronic Product Code (EPC). It does not help that, in the evolution of bar-code systems, portions of the retail supply chain retain a variety of legacy coding schemes. In a recent example, the program manager for implementing item-level RFID on the first stock-keeping unit (SKU) at full production speeds for a large pharmaceutical firm identified artwork requirements for seven different symbologies, including GS1, Interleave 205 (Interleaved 2 of 5 bar code) and Healthcare Distribution Management Association (HDMA) linear bar codes, the National Drug Code (NCD), a 2D bar code and an RFID code. The industry has yet to agree on batch and lot number representations for these coding schemes. That's the bad news. The good news is that these identifiers can nonetheless serve as keys to link information on the Web with enterprise application data.

Associating unique identifiers with metadata related to a business process when data is captured is a second challenge. EPC Information Services (EPCIS) specifications, at the time they were written, assumed that a handheld bar-code or RFID reader would be attached to a dedicated enterprise application, such as a warehouse management system (WMS) or a transportation management system (TMS) with defined business processes. But how do you ascertain the business-process context of a standalone smart reader or smartphone connected to an Enterprise Service Bus (ESB), or to the cloud, where many applications are running?
How might companies begin to analyze Big Data in omnichannel retail and mobile retail commerce settings, despite the challenge of processing huge volumes of information in real time? As was demonstrated at the Auto-ID Labs Big Data Conference, companies utilizing GS1 structured identifiers for product labeling may have the opportunity to relate data captured when a customer scans a bar code using a smartphone with legacy applications employing those same identifiers. During the retail panel at the Auto-ID Labs Big Data conference, Venk Reddy, Walgreens' senior director for connected health, described the success of his company's mobile application, whereby customers scan their prescriptions' bar codes to order refills—a system that now accounts for 40 percent of all refills.

A second example provided by Abhi Dhar, Walgreens' chief technology officer for e-commerce, speaks to the opportunity of opening application programming interfaces (API's) to legacy enterprise systems. By creating a set of APIs to its photo-printing store systems for independent software developers, the company now supports more than 17,000 applications, providing the option to print an image at a Walgreens store nearby.

These two examples from Walgreens' e-commerce business show how a company, using off-the-shelf smartphone data-acquisition capabilities (bar-code or RFID scanning software) in conjunction with a customer-loyalty program and APIs to a shared infrastructure (photo processing, in this case), can link information from the Big Data world to enterprise applications using GS1 identifiers.

However, as was pointed out repeatedly during the course of the conference, provisioning and managing these services, which reside in the cloud, remains a challenge.

During his summary remarks from the conference, Sanjay Sarma, a cofounder of the Auto-ID Center and the research director of theAuto-ID Labs, proposed to expand this approach to actually building models of things we are familiar with in the cloud. A "Cloud of Things" concept builds on several ongoing projects at the Labs to connect objects and their operations, such as vehicles and buildings, to the cloud. This initiative is open to companies, nonprofits and individuals interested in using Big Data resources to promote the development, adoption and commercial success of a Cloud of Things.

A Cloud of Things approach is important, because neither the Internet of Things nor conventional machine-to-machine (M2M) approaches will likely be able scale across multiple domains to represent networked systems with any communality. By building models of legacy systems infrastructure, along with APIs that can be accessed via the cloud, we can ease the task of moving information up and down the demand chain. This is likely to be more efficient and scalable than point-to-point linkages between intermittently connected systems. Businesses interested in prototyping such models—including smart-grid, smart-transportation and smart-manufacturing networks—are invited to join the Auto-ID Labs Cloud of Things initiative. To learn more, visit theAuto-ID Labs at MIT Web site.

A complete agenda and presentations can be downloaded from the conference Web site. Stephen Miles can be reached directly at s_miles@mit.edu.