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Campus-wide RFID System Tracks Books and Assets, Manages Access Control

Saint Louis University, in the Philippines, has deployed a solution from Image Innovations Services using PTS's ClearStream middleware and a variety of fixed and handheld readers.

By Claire Swedberg

Tags: Asset Tracking, Security and Access Control

Feb 18, 2018—Saint Louis University (SLU), a private Catholic university in Baguio, the Philippines, has deployed an extensive radio frequency identification solution that encompasses student and employee access, asset tracking and library management, all on a single platform. The solution was provided by Image Innovations Services (IIS), using Portable Technology Solutions (PTS)'s ClearStream RFID middleware. The deployment started in the library, but the technology is now tracking individuals' ID badges, as well as asset tags at all campus and parking-lot entrances.

SLU, located approximately 250 kilometers (155 miles) north of Manila, has a student population of about 30,000. That includes not only college-level students, but also those in high school and elementary school. The university requires students and personnel to use ID badges to enter its campus, regardless of their schooling level. With the large flow of people entering and leaving campus all day, queues sometimes formed as individuals waited to tap their high-frequency (HF) RFID cards against a reader to be authorized to enter.

IIS traditionally provided access control and security to schools and colleges via PVC ID cards, says Jeff Catbagan, the company's owner. The firm launched with that technology in the 1990s, then began offering bar-coded cards, then cards with magnetic strips. About five years ago, it began providing 13.56 MHz HF RFID cards compliant with the ISO 15693 standard. One of its customers was Saint Louis University.

In 2015, IIS first demonstrated an ultrahigh-frequency (UHF) RFID-based solution to the university, in order to enable a faster, more reliable and seamless entrance to the campus, as well as to provide better data to managers regarding who entered and exited. However, the department that first deployed the system was the school's library, which was already using HF RFID for book and media management, and required a more reliable and automated system. Since it anticipated benefits that would quickly outweigh the installation costs, the university opted to begin planning the installation immediately.

In 2015, the UHF RFID technology was taken live at the school's six-story Charles Vath Library Building, located on the main campus. Since then, it has tagged 200,000 items, including books and DVDs. Previously, RFID tags attached to books and media were read by a desktop reader before being removed from the library, but were otherwise rarely interrogated.

With UHF RFID technology, the data can also be made available in other ways. The university installed Impinj Speedway R420 readers and Times-7 antennas at the checkout desks, as well as at portals for each doorway. It also acquired a Zebra Technologies RFD8500 handheld UHF RFID reader, to be used in Geiger counter mode.

With the system in place, an individual can utilize the ThingMagic USB UHF RFID reader at the counter to check out books or other media, with the ID number on that person's ID badge linked to those materials in the library's software. He or she can then carry the items out the door.

The reader at the doorway captures the ID numbers of all books, even if they are stacked tightly together, then transmits that data to the ClearStream RFID middleware, which interprets the information and forwards it to the library's management software. If the software determines that any of the items have not been checked out, and alert is displayed at that location, and the software can update the status of those materials as having been removed. Once a book is returned, the library's circulation desk RFID reader interrogates its tag ID and updates the book's status as received, and the book can then be returned to the shelf.
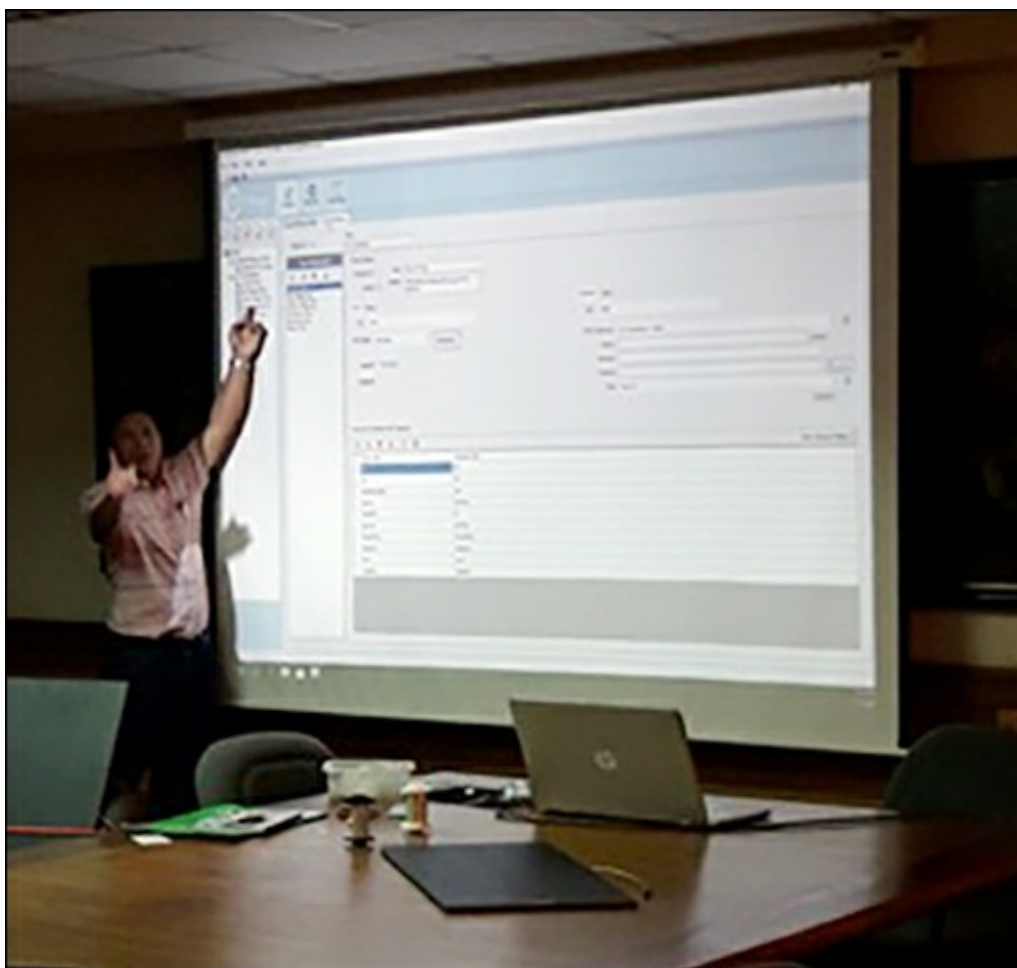
The greatest advantage of UHF is not only the ability to quickly read stacks of tagged items, Catbagan says, but also the capacity to search for items throughout the library. Employees can simply input a particular book's description in the software, which is linked to that item's tag ID, then walk around the library. The reader will sound an alert when it captures the ID it seeks, and can then guide the user to that location based on read strength, reflected by the speed at which the device beeps, as well as the flashing of the light on the reader.

Following the library deployment, SLU reassessed the technology and its benefits, then began planning to install the system campus-wide for the purpose of tracking students, employees, assets and vehicles. That, says Catbagan, is where the ClearStream RFID solution's advantage comes into play, since it enables the university to scale its deployment over time, and to keep all applications on a single platform.

The college installed the same Impinj readers being used by the library. In this case, the devices were deployed at all of the school's 15 entrances and exits. With two antennas at each gate, the software can determine the direction in which a tag is moving, based on which antenna captures its ID number first. "The software doesn't generate a record until the tag passes the second antenna," Catbagan explains, thereby ensuring that the system does not capture any tags near the gate that do not pass through it.

New student and employee badges come with built-in UHF RFID tags. (All tags used on the campus were custom-made for the school by IIS's providers to operate well with the specific application.) In the case of young students—such as elementary school-aged children—the system captures each badge's tag ID, after which the software prompts a text message to be sent to parents indicating that their children have arrived. That process is accomplished again once a child leaves the school at the end of each day.

For college students and employees, no messaging is necessary. However, the university utilizes the technology to ensure that no unauthorized individuals enter the campus. For instance, if an individual has been restricted from coming onto campus—a form college student no longer enrolled, for instance—a red flag is linked to that person's tag ID number. In the event that he or she arrives on campus with an unauthorized ID badge, the reader will capture the ID, the software will determine that this person is not authorized and an alert will sound for security posted at the entrance.

With regard to asset management, tags are being applied to high-value mobile assets, such as laptops or other electronics, or to paper files that should not leave the campus. The system will sound an alert if a campus entrance reader detects any tagged items moving past it.

"This has been a huge project," Catbagan states. However, he notes, the deployment has been relatively seamless since the library-based solution was already in place. "ClearStream RFID is versatile enough that you can use it for anything—books, employee cards, assets." The data is hosted on SLU's local server, and changes can be quickly accommodated, such as the addition of new tagged items. "You don't have to have programmers to set it up," he says.

The next phase will be to track vehicles that enter the university's parking areas. Windshield tags are being applied to the vehicles of those authorized to drive onto campus, and three readers are being installed at lot entrances to interrogate those tags and determine whether an arriving individual can enter.

Thus far, Catbagan says, "The school has been overwhelmed with the benefits they are getting from the system. We have provided just one technology for all applications that would, otherwise, be very expensive and hard to integrate." In the long term, he reports, IIS intends to provide similar solutions to other schools or universities throughout the Philippines.