U.S. Patent and Trademark Office Tracks IT Assets

The federal agency tagged more than 115,000 items to improve inventory efficiencies and reduce costs.

By Lauren S. Roman

The U.S. Patent and Trademark is headquartered in Alexandria, Va.

THE UNITED STATES PATENT and Trademark Office (USPTO), a performance-based federal government agency, is funded by the fees charged for filing patent applications and trademark registrations. Its mission is to administer the laws and regulations related to patents and trademarks in order to promote industrial and technical progress in the United States, and thereby strengthen the domestic and global economies. The USPTO carries out its mission by examining patent and trademark applications, issuing patents and registering trademarks, disseminating patent and trademark information to the public, and encouraging a domestic and international climate in which intellectual property can flourish.

The USPTO comprises nearly 13,000 employees, plus an estimated 2,000 contractor support personnel. Its main campus is located in Alexandria, Virginia, and consists of eight buildings housed on approximately 2.5 million square feet of office space. The agency also has four regional offices located in Detroit, Denver, Dallas and San Jose. It maintains more than 115,000 assets—including IT and AV equipment, photocopiers, hubs, iPads, printers, routers, servers and televisions—at its various locations.

The agency falls under the Department of Commerce (DOC), which requires all bureaus and offices to inventory assets annually. To meet the DOC's mandate on time, the USPTO conducted inventory counts four times annually. Property accountability officers (PAOs) and property custodians (PCs), including senior-level execu-

▼ **Wes Clark**

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tives and GS 14- and 15-level employees, were responsible for conducting the counts. Some of the PCs are also patent and trademark examiners who review applications. These employees spent roughly 7,700 hours a year managing assets rather than reviewing revenue-generating applications. The USPTO also found that, on average, a patent and trademark examiner often spent up to six hours every year verifying equipment.

Tom King, who works in the Office of Administrative Services (OAS), is responsible, along with Vickie Bryant, for overseeing the Chief Administrative Office's (CAO) property- and asset-management programs at the USPTO. King and Bryant were both aware of how time-consuming the asset-inventory process was, and of the impact on the agency's mission. They knew there had to be a more efficient way, and thus reached out to Wes Clark, from the Office of the Chief Information Officer (OCIO), to discuss ideas.

"By and large," King says, "most government agencies consider asset management to be secondary compared to their main mission.

We saw that automating the location and movement of our assets with RFID technology would allow us to spend more time fulfilling USPTO's main goals."

In September 2016, the USPTO deployed an RFID asset-tracking solution. The system monitors more than 115,000 IT assets at multiple locations and spans more than 160 floors where nearly 15,000 federal employees and contractors work. The expected return on investment for the $2.8 million project is 18 months, King says. So far in Q3 of 2019, 120,00 assets have been tagged.

Investigating and Planning

IN 2014, CLARK, BRYANT AND KING began to investigate RFID to determine whether the technology could be put to work to address the

The USPTO deployment uses Metalcraft Universal RFID Asset tags designed to work on metal, plastic and wood surfaces.

USPTO's inventory problems. King had read an article about Walmart's use of RFID to track inventory. He called asset managers at other government agencies and learned that the U.S. House of Representatives was using the technology in conjunction with Remedy (now BMC Software) enterprise-resource planning (ERP) software, which the

USPTO also employed. The House was RFID-tracking its treasure-trove of historic furniture, and King figured that since furniture is an asset, the system the House was using would work to monitor the USPTO's assets.

King, Clark and John Hassett, who was the director of OAS at that time, decided to pay the House of Representatives a visit. The House property managers showed them how they were using RFID to quickly verify furniture location informa-tion contained in their ERP. "We learned that the technology behind RFID isn't complicated or hard to implement," Clark says, "but it represents a new way of thinking about asset management, and how to let technology do the grunt work.

The USPTO received budget approval from the Office of Management & Budget. In July

2014, the USPTO notified the indefinite delivery/indefinite quantity (IDIQ) contract holders that it needed quotes for an RFID-based asset-tracking solution.

Impinj Speedway xPortal R640 readers were installed at the base of public stairways, because they are esthetically pleasing.

Digital Technologies Inc. (DTI), an IDIQ contract holder, had been providing IT infrastructure, management and support services to the USPTO for many years. A web search brought DTI to Evanhoe and Associates, an RFID systems integrator in Dayton, Ohio. DTI learned about Evanhoe's work with the federal government, including an RTLS-based asset-tracking solution for the U.S. Air Force that they were updating and managing at the time. DTI partnered with Evanhoe on the proposal, and the company was awarded the contract.

The first step for such an expansive project was to develop a project-management plan. All work had to

be coordinated and scheduled with King and Bryant, who was the contracting officer's technical representative for the USPTO. The project was divided into four phases: site surveys and cost estimates, choosing tags and testing software offsite, installing hardware and tagging assets at the Alexandria Campus and then rolling out the solution at the other USPTO locations.

Site surveys were conducted from late October 2015 through February 2016, in order to identify existing RF environmental factors and any business-process issues that would drive the need for specific equipment and tags. No extraordinary challenges were discovered, says Chuck Evanhoe, the company's founder. DTI and Evanhoe presented costs estimates for implementing the RFID solution at each location.

Developing and Deploying

DTI AND EVANHOE selected Metalcraft Universal RFID Asset tags, which are designed to work on metal, plastic and wood surfaces. The passive ultrahigh-frequency

RFID tag has a read range of 15 to 27 feet, depending on the material to which it is affixed. Laptops and other mobile assets required read ranges of 17 feet. DTI and Evanhoe also developed a guide for the support personnel who would tag all the USPTO assets. IT support contractors completed the nationwide asset-tagging project within 90 days.

All told, 440 Impinj Speedway Revolution R220 and R440 fixed readers were installed in hallways and doorways, as well as at emergency exits. Location determinations were based on the site surveys and the USPTO's business requirement to track assets as they move from one floor to another and into and out of buildings. The R220 reader has two antenna ports, while the R440 comes with four ports; in total, more than 1,100 antennas were installed to support the system.

Speedway xPortal R640 readers were installed at the base of public stairways to detect floor-to-floor movement. The devices were chosen because they are esthetically pleasing, King says. Impinj xArray

Each month, Alien Technology ALH-9001 handheld readers are used to verify asset locations.

R680 readers were used at building entrances and security checkpoints, where wide-area monitoring was required. In addition, 10 Alien Technology ALH-9001 handheld readers were purchased to support inventorying.

The software platform is an enterprise-level application that resides on the USPTO's network servers. The system can be readily integrated with the Remedy ERP, capturing data from tag reads and providing real-time visibility into assets' locations. According to King, the user interface was simple and direct, and the fact that it could be seamlessly integrated with the existing system was key.

DTI and Evanhoe provided training for two Office of Administrative Services asset managers (who have administrative rights) and for four inventory support team members (who would monitor assets' locations and report if assets were lost, missing or stolen). Other workers can access general IT asset financial data, as well as warranty, maintenance and surplus information, via the Remedy ERP system.

There were few major obstacles in deploying the system, King recalls, though working through the USPTO's network, firewall and security requirements proved cumbersome at times.

Using and Benefitting

BEFORE THE RFID SOLUTION was implemented, field technicians had to manually update asset-location information when they moved equipment and assigned it to a property custodian. Currently, as assets travel around the USPTO's

facilities, the RFID system automatically monitors their movements. In the future, the system will also track assignments to property custodians. All the information is automatically updated in the ERP software. The result is a significant reduction in the number of errors.

▼ **Tom King**

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On the last business day of each month, workers use handheld readers to verify each asset's location, then update this information in the ERP system. "The handhelds can read hundreds of tags in a matter of seconds," King says, "so it really isn't a major deal." Every month, the system produces a report on any assets not "seen" (read) within the previous 30 days. Knowing where the last reported location was and who removed the asset, he explains, allows for quick action and resolution.

The USPTO examiners are back to work reviewing patent and trademark applications and driving revenue, rather than chasing missing assets and conducting inventories. By the end of fiscal year 2017, the USPTO expects asset-management hours to be cut in half.

By end of fiscal year 2018, the number should be closer to 800 hours annually. "Any diligent asset-management process requires constant involvement from staff," Clark states, "but automating the process with RFID requires far less of it."

"With automated asset tracking and management," King adds, "we can spend less time thinking about where things are and more time planning for future requirements."

Next up, the USPTO would like to require some vendors that supply new equipment to RFID-tag assets before shipping them to a USPTO location.

"I think over the next year or two," King says, "we may very well see the use of RFID expand once folks see how successful we've become in achieving our goals."

UPDATE: The numbers speak for themselves.

By 2018, 120,000 assets were being tracked. This resulted in tremendous cost savings:

- Error Costs: down 54%
- Labor Costs: down 77%
- Loss Prevention Costs: down 98%

The USPTO is saving $1.2M and 11,132 labor hours every year using RFID and ItemAware, realizing an ROI in 2.5 years.

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