Driving IT Modernization and Transformation: Insights from Jamie Holcombe, Chief Information Officer, U.S. Patent and Trademark Office

By Michael J. Keegan

The U.S. Patent and Trademark Office (USPTO) is the federal agency that grants U.S. patents and registers trademarks. Under this system of protection, American industry has flourished. New products have been invented, and new uses for old products have been discovered. Given this critical function, USPTO has unique technology needs. Having a consistent, reliable, scalable, innovative IT infrastructure is critically important to help the agency better serve key stakeholders including inventors and entrepreneurs while also deploying state-of-the-art technology throughout its entire enterprise.

In early 2019, Jamie Holcombe became the chief information officer at the U.S. Patent and Trademark Office (USPTO). He came to the agency to modernize and transform how it uses technology to accomplish its constitutionally required mission. "I came to help the agency," explains Holcombe, "to stabilize and modernize its IT systems and infrastructure, to move it from a client-server-based system to an internet and cloud-driven one."

With a mission-first strategy, Holcombe has sought to drive next-generation enterprise information technology (IT) investments, as well as implement better, faster, and cheaper ways to grant patents and register trademarks. This involves maintaining current systems while leveraging advances in technology, such as cloud, to transform how the USPTO delivers and uses IT services.

Jamie Holcombe joined me on *The Business of Government Hour* to discuss his agency's IT strategy and his efforts to realize its vision. The following is an edited excerpt of our discussion, complemented with updated and additional research.

What are the responsibilities and mission of USPTO?

Our agency's funding comes from the fees we collect. Therefore, we have a fiduciary responsibility to our stakeholders and to our intellectual property community to register trademarks and award patents in an efficient and effective manner.

I came to USPTO to serve and accomplish its powerful mission. As outlined in the U.S. Constitution, our mission is to secure for limited times to authors and inventors the exclusive right to their respective writings and discoveries. It is a solemn duty. USPTO is "America's Innovation Agency" as we award patents and register trademarks for those who have created some of the greatest things the world has ever seen.

I'm proud to support our mission to ensure that the intellectual property system contributes to a strong global economy, spurs job growth, encourages investment in innovation, and fosters our nation's entrepreneurial spirit.

I came to help the USPTO stabilize and modernize its IT systems and infrastructure, to move it from a client-server-based system to an internet and cloud-driven one. Our moves in this arena will mean much more efficiency and agility as we deliver business value to our customers.

What were your initial challenges?

Upon arriving at the USPTO, I recognized the need to change our culture to improve delivery and workflow. With my team, I focused on creating a "New Ways of Working" (nWOW). I challenged our IT staff to automate more workflows to make things better, cheaper, and faster. Though some efforts may fail in thirty, sixty or even ninety days, in the short term, we can learn from small failures and adapt.

As I learned in the Army, checklists and SOP's (standard operating procedures) are merely guidelines for tactical execution. What matters most is what happens on the ground. Bringing this mindset into how we execute IT at the USPTO is key to producing better, faster, and cheaper results. We need to be more agile, and bring commercial best practices into the agency. Given that the USPTO is a fee-based organization, we have an obligation to operate more like a commercial business.

As an example, with our "people to teams" effort, we adopted a matrix organizational approach. Staff maintain their reporting structure and job descriptions, but are detailed to product teams. We eliminated the project management organization and created business product teams. We pivoted from managing over 200 separate, unique projects to thirty products across four product lines: patents, trademarks, enterprise business, and enterprise infrastructure. Each product line has about seven or eight products within it. With this product-driven approach, we have a new way to operate and manage IT offerings that are better, cheaper, and faster.

What is your role at USPTO?

As the CIO, you must set the vision and develop a roadmap outlining how to realize that vision. This has to do with transforming the culture. There are three key elements: people, process, and tools. You must apply the right tools to the right people with the right processes. All elements are necessary to make sure that we accomplish the mission. We are a support organization that provides the best tools to the patents and trademarks teams. In the end, we accomplish our mission by supporting the organization in meeting its mission: awarding patents and registering trademarks.

I reference the old real estate adage: location, location, location. Similarly, my three biggest priorities are culture, culture, and culture. We need to ensure that people have the right attitude while pursuing our new ways of working. This culture shift includes moving away from the old ways, and toward the new ways of working. It requires you to act now. You must have a sense of urgency. You must be bold. Do not just do little things, but do something that really matters.

Finally, seek to simplify processes. It is all about a sense of urgency. You must make people see and feel a sense of urgency. One of the most effective commercial practices I have adopted is a thirty-, sixty-, and ninety-day plan. If you cannot complete an IT modernization effort with milestone results in ninety days, then do not do it! Our goal is "Better, Cheaper, Faster."

How did you go about modernizing the agency's IT?

We have a good understanding about which applications should move from the current client-server environment to the cloud. Our thirty product teams review their applications to assess not only the ease of migration, but the business case for doing so. It has to make business sense to move an application to the cloud.

There are applications that are sometimes process intensive and/or storage intensive—so it makes better business sense for those to remain in our data center. We will continue to assess our move to the cloud on an application-by-application basis with a solid business case analysis. Most of our twenty-year-old applications are client-server based. We must assess how quickly we can move these applications into the cloud and modernize them, analyzing the trade-offs: what we can stabilize and what we can move while simultaneously being able to deliver on the agency's mission. Since our transformation efforts began, we have stabilized over twenty-six critical systems, and have a plan to modernize based on prioritizing "high-value" assets.

Early in my tenure, we focused on security and stabilization for our core IT infrastructure, which helped us transition to remote work seamlessly. With roughly 13,000 staff across the U.S., we operate both a network operations center (NOC) and a security operations center (SOC) that runs twenty four hours a day, year-round. A big part of that security and stabilization focus has been applying automation to the NOC and SOC with the help of machine learning (ML) and robotic process automation (RPA). We have reduced alerts caused by false positives and automated security compliance tasks.

How do you use technology to transform service delivery?

Today we see service expectations have changed. People put value on ease and convenience and wonder why the government cannot adopt a more commercial way of doing business. We need to transform the way we serve customers in the best way possible.

Our job is also to provide the best tools for our patent and trademark examiners. For example, our patent examiners' ability to find the best "prior art" quickly ensures both quality and timely examination, two primary goals of the USPTO's Strategic Plan. Agency teams have been working diligently to improve the search capabilities for examiners so they can readily identify patentable subject matter. Our new Patent End to End Search tool now with artificial intelligence (AI) can help examiners do their vital work more effectively with swift, easy access to the relevant prior art they need. This tool currently provides examiners access to millions of foreign documents and full English translation documents.

Our teams used TensorFlow and Python to create new machine learning (ML) algorithms. We augmented our new patent search tool with machine learning to help examiners search not just for certain words in a patent filing, but the concepts. When it comes to using machine learning, our approach involves having employees in the loop to train the models, coach them, and enhance the algorithms. It is all about augmenting examiners, not replacing them.

How are you using emerging technologies to shape the future of the agency?

We hired Jerry Ma as the director of Emerging Technologies from the private sector. Ma has a phenomenal approach and vision for how to leverage emerging technologies. As we proceed, we need to engage in further proof-of-concept efforts and pilots with emerging technologies, so we can get verifiable results. We need to understand the pros and cons of such technologies as RPA, blockchain, and AI/ML. Today, we are already putting AI/ML models and RPA tools to work for new operating efficiency.

I was thrilled that our agency won a 2021 Future Edge award for our success in leveraging emerging technology for our business. As we continue to move fast, we're making a significant difference, saving resources and gaining new operating efficiencies. Grounded in our efforts are best practices in the work we do; people across business units create, try, test, fail fast, launch, and learn to make
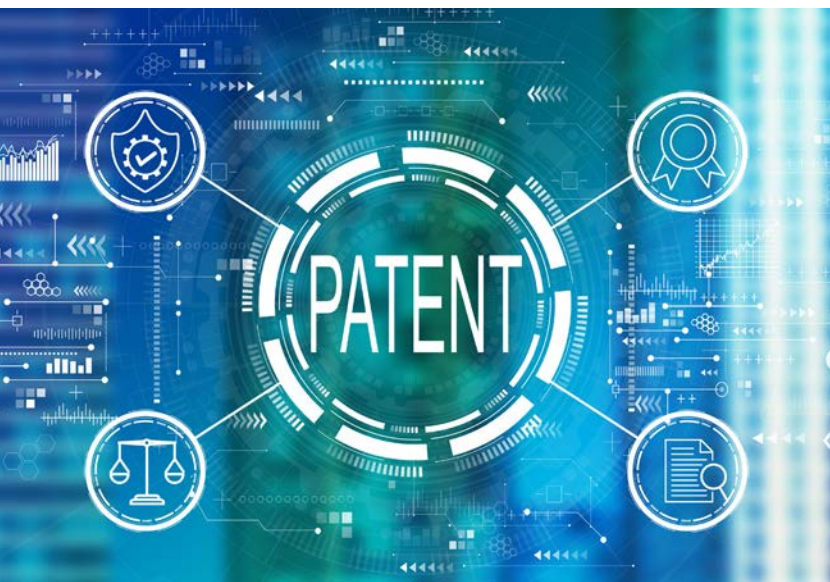
technology and tools the best they can be. I know these new technologies can help shape the future of the agency.

Though we should engage in new endeavors by doing research and development, we also need to ensure we get results. If we do not get results at the end of ninety days, then you must starve that failure. We should learn from failure, and feed success. If you achieve success at the end of a pilot, then you figure out how to adapt, build your business case, and decide whether to invest or not in that technology for that specific area. Execute, learn, iterate, and repeat!

What was your experience with virtual work during the pandemic?

The USPTO has had in place a longstanding, robust telework program. Of the nearly 9,000 agency examiners, almost 75 percent telecommuted before the pandemic struck. Since early 2020, we have proven that 98-99 percent of us can do our job at home and do it just as well or better. We significantly upgraded our bandwidth just in time, thanks to a novel partnership we struck with NOAA, another agency within the Department of Commerce. During the pandemic, we saw that our productivity metrics improved.

> To learn more about the U.S. Patent and Trademark Office, go to uspto.gov.

To hear the interviews from *The Business of Government Hour*, go to businessofgovernment.org/interviews.

To download the show as a podcast, go to PodcastOne or iTunes and search for *The Business of Government Hour*.

To view excerpts of the show, go to youtube.com/businessofgovernment.