Thales

How Software Innovation and Agility Brought Thales to New Heights

Bringing Software Innovation Back to the Aerospace, Transportation, and Defense Industries

It’s not as if Thales is new to software development. Around 15% of the French company’s 65,000-person workforce is made up of software engineers. And software plays a key role in nearly all of its products, largely critical systems for the aerospace, transportation, and defense industries.

“All of our products are very software intensive,” said Thales’ Stéphane El Mabrouk, who runs the company’s digital operations. The Australian Navy, for example, relies on Thales sonar and software to help guide its submarine fleet. And the company was recently awarded a contract by the European Space Agency, which uses Thales-made satellites and software to search for black holes and ripples “in the fabric of space-time.”

Customers are Becoming More Sophisticated in Their Software Usage

In recent years, Thales noticed a shift in expectations as its customers became more sophisticated in how they use software to serve their own clients.

“We observed that our customers are embracing digital transformation themselves, so they wanted Thales to be more innovative and deliver new digital products to market faster,” said El Mabrouk. “That’s one big reason why we embarked on our own transformation to modernize how we develop and use software to deliver value to our customers.”

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Stéphane El Mabrouk, Head of Operations, Thales Digital Factory

Thales

INDUSTRY
Manufacturing

HEADQUARTERS
La Défense, France

SOLUTION
Pivotal Cloud Foundry on Microsoft Azure, Concourse for CI/CD
The Digital Factory Exists Outside of IT—and Lets Thales Developers Practice Modern Software Development

By 2017, many of the Thales’ 10,000-plus software engineers were already practicing some tenets of Agile methodology. But the overall software development lifecycle more closely resembled a traditional waterfall approach. Engineers were organized by functional roles—development, QA, operations, etc.—and it took months, sometimes years, for software to move from conception to production.

El Mabrouk and his team knew Thales’ software engineers needed to adopt modern software development methodologies, such as continuous integration/continuous development, to increase release velocity and to deliver new products and services to market faster, as its customers expected. They also needed to upgrade its legacy infrastructure to a more modern platform that allowed developers to implement these new techniques effectively, while also supporting important functional requirements like cloud portability and robust security.

The first step El Mabrouk and his team took, however, was to establish a new entity, separate from the existing Thales IT department, to support its transformation efforts. Thales Digital Factory, as they called the new entity, would allow developers working there to get a fresh start. It would serve as a white sheet of paper, as El Mabrouk put it, where developers could practice modern software development without distraction or the risk of being sucked back into the traditional ways of doing things.

The Digital Factory was established in July 2017 in Paris with a team of 10. Today, 230 people work at the Factory.

“Everyone that comes to work here is excited to build great software and make a difference,” El Mabrouk said. “They love the freedom, the autonomy of creating software this way.”

Balanced Teams Lead to Project Ownership—and Better Outcomes

With the Digital Factory in Paris up and running, developers began building new, customer-facing applications and improving existing internal software using modern techniques and best practices. These techniques include organizing into balanced teams made up of project managers, developers, and designers. This approach allows teams to take real ownership over their products, increasing the chances for successful outcomes compared to the more traditional project-based, assembly-line approach. Teams develop their software in small batches, iterating over time based on user feedback. And they continuously test the quality and security of their software throughout the development process.
PCF Helps Thales Get Automated in No Time

To make the most of these new techniques, developers at the Digital Factory develop and run their software on Pivotal Cloud Foundry (PCF), a modern, cloud-native platform purpose-built to enhance developer productivity and enable extreme operational efficiency. The platform streamlines the process of getting new development environments up and running, and removes administrative burdens like provisioning virtual machines and configuring networks. The result is that developers spend more time doing what they do best: writing code.

“One of the biggest changes is when the team wants to start on a new product, they can get all the resources they need and be up and running in a few hours with PCF,” El Mabrouk said. “With our old way of doing things, this would take a couple weeks, at least. Now, they scope their product and day one they can start coding. It’s a wow effect for them.”

PCF’s automation capabilities were also important factors for Thales. With the help of Concourse, a continuous integration/continuous delivery system tightly integrated with the platform, PCF allows developers to automate delivery pipelines.

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Stéphane El Mabrouk, Head of Operations, Thales Digital Factory

Thales Uses PCF to Meet Their Customers’ Deployment Preferences

In addition to improving developer productivity, El Mabrouk and his team chose PCF for two other important reasons. One is cloud portability. Thales has customers all over the world in a myriad of industries. No single deployment model can satisfy the needs of all of them.

“That is why it is important for us to support a hybrid cloud model,” El Mabrouk said. “There will be times our customers need to run our software in the public cloud. But other times, due to local regulations, architectural best practices or just customer preference, we will need to run our software on-premises or even on edge devices.”

PCF lets Thales meet its customers different deployment preferences. The platform runs on all three major public cloud infrastructure providers—Microsoft Azure, Google Cloud Platform, and Amazon Web Services—as well as on VMware and OpenStack, the most common private cloud environments. Thales’ public cloud of choice is Microsoft Azure, and with PCF, it is able to deploy and run software wherever a given customers demands it.
PCF Automates Thales’ Core Security Functions

The second, related important factor in El Mabrouk’s decision to deploy PCF was security. Thales’ customers, in addition to being spread across the globe, operate in some of the most security intensive sectors in the world. From defense and aerospace to transportation and energy, Thales customers demand strong security.

With PCF, Thales is able to better integrate security into the development and operations process, an emerging approach referred to as DevSecOps. This approach stresses automating core security functions as software is being developed, rather than viewing security as something that is bolted on after the fact. By thinking about security early in the process and testing for vulnerabilities frequently, the resulting software is more secure.

“We try to embed security in new products from the start and we write user stories that are focused on security functionality,” El Mabrouk said. “We implement security checkpoints throughout the development process, and PCF helps us execute at scale and speed with its automation capabilities.”

Another benefit of running its products on PCF is performance: Software running on PCF at Thales averages 99.7% uptime, according to El Mabrouk.

As Innovation Accelerates, MVPs are Coming in Fast and Furious

Today, there are more than 200 containers running on PCF at Thales, which translates to 15 products in various states of development at the Digital Factory. Five are focused on internal functionality to support Thales operations, such as HR and finance, and the remainder are new, customer-facing applications. These include a new product that helps airports optimize their daily operations by analyzing flight and equipment data and making recommendations to limit disruptions to passengers and staff.

As each product reaches MVP stage and is pushed to production—a process that takes a fraction of the time compared to the traditional path to production at Thales—the plan is to shift them and the teams that built them back into the business units, according to El Mabrouk. There, teams are responsible for operating in production and continuing to iterate their products using the modern development techniques they learned at the Digital Factory, all running on PCF.

The first MVP coming out of the Digital factory, an application for Thales Avionics, hit the market after just three months.

“Our developers are reinvigorated by the agility, the autonomy, the freedom to act that we introduced with Thales Digital Factory and Pivotal Cloud Foundry,” El Mabrouk said. “And we did so without sacrificing either the deployment flexibility or robust security we need. If anything, our PCF platform is more secure than our traditional environment as we become more proactive.”
More Digital Factories are on the Way

Thales Digital Factory opened an office in Montreal in March, and plans to open one in Singapore in the coming months. This will require El Mabrouk to recruit new developers, project managers, and others to the team who are eager to build modern software on a modern platform.

“We are looking for people that have that entrepreneurial spirit to tackle all the dimensions of a new product,” El Mabrouk said. “The way we operate at the Digital Factory, teams take total ownership of their products. They are responsible for developing the product but also ensuring there is market fit and developing a sales strategy, for example. It’s very different than the traditional way of working.”

It is all part of the company’s efforts to move faster, become more agile, and use software to the deliver its customers unrivaled products and services.

“The Digital Factory is positioned as an accelerator for our innovation cycle and for the developments of our products,” El Mabrouk said. “We are still early in our transformation, but we are already seeing results and that’s exciting.”