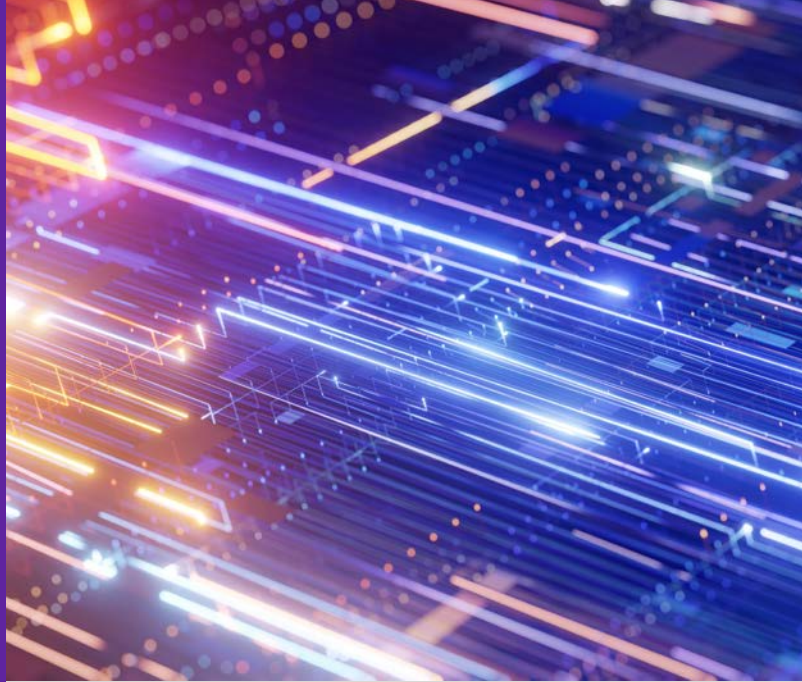


In-factory production calibration environment

Case study



Client:

For a world-leading pioneer in complex photolithographic systems

Technologies and tools:

Java

Agile

C#



Luxoft is helping to advance the global chip manufacturing process



Direct and stable contact between Luxoft engineers and the client's customers



Optimized production efficiency and support

Challenge

The complexity of our client's photolithographic machines is sometimes hard to comprehend. Having taken decades to develop, a single machine can cost more than \$150 million and may consist of 100 000+ parts all of which are very dependent on the software that drives them. Building and operating these machines is a miracle of modern engineering and technology, however after they have been built (in laboratory conditions), they need to be shipped to customers' fabrication facilities (fabs). This can require 40 shipping containers, 20 trucks and three Boeing 747s. The machines then need to be set up in their customers' fabs. Testing the machines in laboratory/factory conditions is one story, putting these machines into a production line where they need to work optimally in terms of productivity (as high as possible), availability (95% is essential), and also to reach desired precision in nanometers, is another. Therefore, machine optimization in the production line is absolutely essential and at the same time — a rather complex topic. It requires a special software ecosystem which contains tens of different applications and supports the fab automation process, where the whole production line is automated and optimized as much as possible in order to maximize productivity, precision and the desired availability of the machines.

What our client required was to build a competency in the calibration environment area and develop, enhance and support the whole software ecosystem.

Solution

At the very beginning the client requested us to build a competence on-site and nearshore and, also provide a number of software engineers with a specific competence level to work in joint teams, in order to develop, enhance and support the current software ecosystem. Additionally, it was essential to help modernize and enhance in-house software development practices since software breathes life into the machines and the software could not be created in a hardware-centric organization. Luxoft proved to be an expert in the required areas and became a trusted partner in this journey, despite the challenging size of the ecosystem and vast source code archive that needed to be transformed and modernized.

For many years now, Luxoft's team of domain experts have been involved in the process of creating and evolving the software which allows our client (and their customers) to continuously monitor the production process (software accounts for 40% of it) for these hugely complex machines. This software ecosystem is able to collect data from multiple sources, applications, provide measurements and data analytics, process it and then use it to continuously calibrate the machines. This holistic approach ensures that the accuracy and efficiency that existed in the lab environment is being replicated and maintained in the semiconductor fabrication facilities.

Results

- Alongside the client, Luxoft's helping to advance the global chip manufacturing process
- Symbiotic maturation of client and Luxoft (we're continuously helping modernize their software processes)
- Direct and stable contact between Luxoft engineers and the client's customers, to receive early feedback and exact requirements from the end users
- Optimized production efficiency to ensure 95% availability of the machines
- To be aligned with client's requirements, build a required expert level of knowledge, and be able to provide fast ramp up, Luxoft established a special legal entity in the client's country
- Gradual moving from staff augmentation to managed delivery type of engagements

Technologies

- Java, C#, Agile

About Luxoft

Luxoft is the design, data and development arm of DXC Technology, providing bespoke, end-to-end technology solutions for mission-critical systems, products and services. We help create data-fueled organizations, solving complex operational, technological and strategic challenges. Our passion is building resilient businesses, while generating new business channels and revenue streams, exceptional user experiences and modernized operations at scale.

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