CASE STUDY

Building an Enterprise Plant Management Platform to Improve Operational Efficiency for Commercial Laundries

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For decades, commercial plants have been relying on third-party software to control machines, streamline operations and automate day-to-day tasks. As technology changes and client expectations grow, third-party software providers are challenged with upgrading their platforms while also ensuring that customer plants remain operational and productive.

Leading up to late 2015, one provider of enterprise plant management software for commercial laundries was struggling to maintain a product built with legacy technologies that lacked a single platform for all geographical regions as well as several features required for plant management and reporting. On top of this, the software was incurring hefty licensing fees, making it potentially unsustainable for the long term.

In January 2016, the company turned to EPAM to build an in-house enterprise solution and take over the project from a previous vendor, who EPAM had recently acquired. EPAM implemented its robust engineering and delivery practices to improve the state of the project and went on to build and roll out the platform in 30+ customer plants over the course of two years.

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TAKING OVER THE PROJECT WITH AN EXTENSIVE SCOPE OF WORK

By the time EPAM took over, the state of the project was in deep red, and customer confidence was so low that the business was contemplating terminating the project altogether. Releases were not predictable, there was a huge number of bugs in the ever-growing backlog, and the customer couldn't move forward on user acceptance testing (UAT) because of constraints stemming from poor product quality.

As a result of these issues, the customer's go-live plans for the solution were continuously postponed. Recognizing these challenges, EPAM agreed to take over the following original scope of work:

- Build a single in-house plant management software platform to serve the client's global textile care customers
- Eliminate hefty licensing fees on third-party software by building and testing an all-in-one proprietary solution
- Enhance the user experience by modernizing user interfaces and reporting capabilities
- Provide guidance for users to make timely decisions to optimize costs and plant efficiencies
- Migrate 20 existing North America and Europe customers to the new solution

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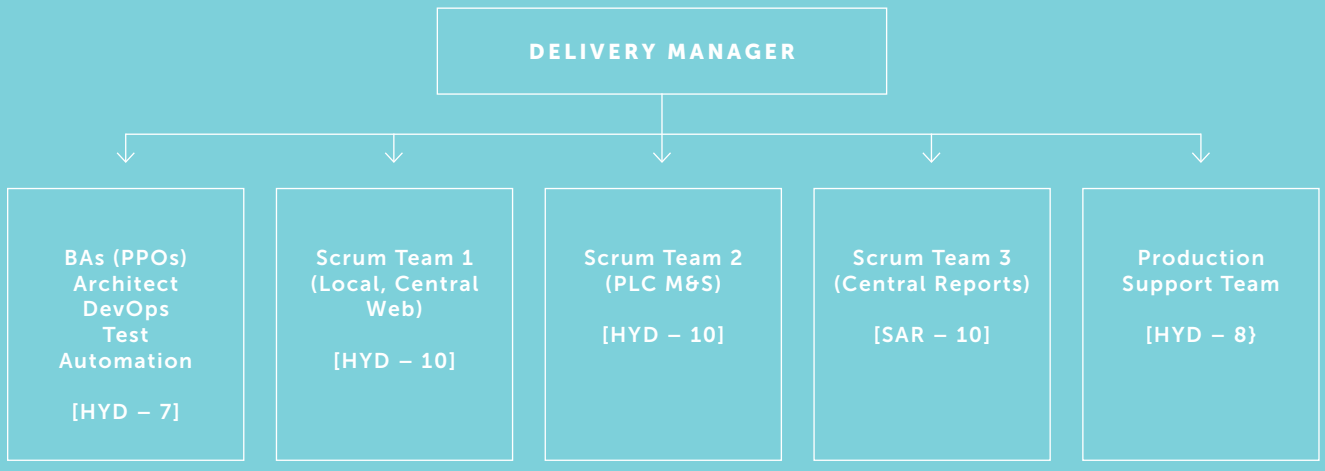
ASSEMBLING THE RIGHT TEAM & CAPABILITIES TO GET THE JOB DONE

EPAM brought in experienced account and delivery management teams to discard and replace the dysfunctional activities and processes that were having a negative effect on the project. Under the guidance of multiple expert functional and technical teams, EPAM streamlined and improved the following project processes and activities:

- Scope management
- Change management
- Quality assurance (QA)
- DevOps
- User acceptance testing (UAT) and sign-offs
- Client expectation management
- Delivery management
- Internal/external communication
- People management
- Engineering excellence (EngX)

With the right delivery and account management personnel in place, EPAM assembled a robust team of 50 total people, including 26 developers, 16 QA engineers, three business analysts, one architect, three project managers and one delivery manager. The geographically distributed team was responsible for four work streams and was spread across two EPAM locations: Hyderabad, India and Saratov, Russia.



HYD = HYDERABAD, INDIA | **SAR** = SARATOV, RUSSIA

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SOLVING DEVELOPMENT CHALLENGES WITH QA, DEVOPS & ENGX

After redefining the scope of the project and assembling the right project teams to get the job done, EPAM got to work on building and testing the solution. EPAM teams used best practices in QA, DevOps and EngX to speed time-to-market and save costs for the customer.

EPAM's QA engineers were responsible for decreasing the customer case reopen rate and reducing the amount of manual testing needed for platform releases. Reopens were contained by conducting comprehensive bug review, and the regression suite was revamped using a risk-based testing approach to cut down the number of test cases from 3,000 to less than 500. Furthermore, the most painful, bug-generating test areas were automated.

Since there was originally no streamlined DevOps pipeline for CI/CD, EPAM created the architecture from scratch to suit the project needs. Quality gates and gated deployments were introduced into the DevOps pipeline, resulting in faster feedback to the team, the elimination of human error and reduced overall deployment time.

From an EngX perspective, there was very poor unit test coverage with glaring SONAR violations, lots of duplicate code and ineffective code reviews. EPAM teams created code review checklists and used tools like Resharper and SONAR Lint to optimize code quality and reduce code complexity.

Combined, all of these activities ensured a successful platform launch and migration for the client's existing customers.

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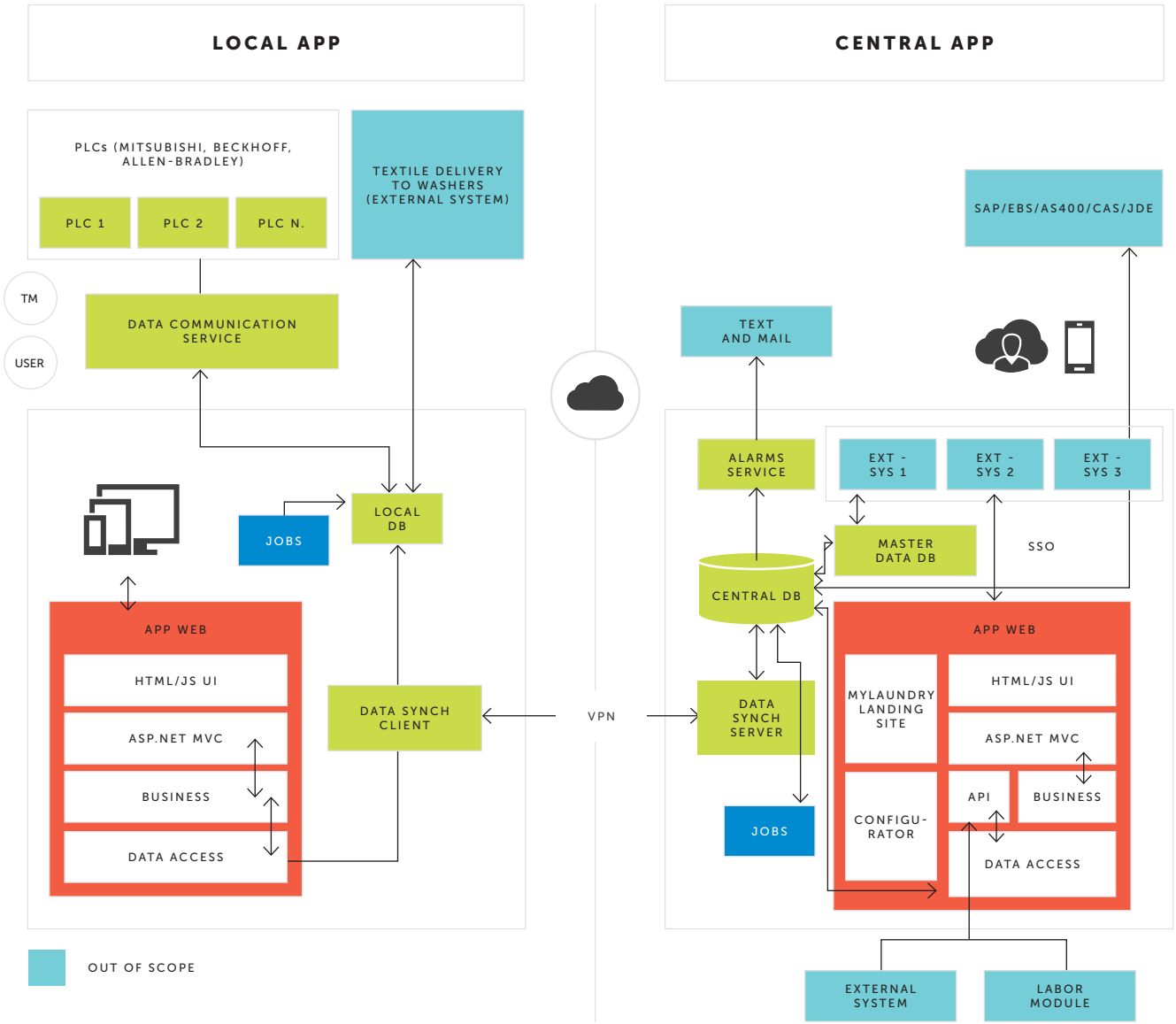
SOLUTION ARCHITECTURE AT A GLANCE



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TECHNOLOGY STACK AT A GLANCE

SERVER SIDE

- ASP.NET MVC 4 Web API
- C# .NET Framework 4.5
- Castle Windsor Framework
- MOQ Framework
- Auto Mapper
- Winnovative PDF/Excel tool
- High Charts
- MessagePack
- ELMAH and Log4Net Framework

CLIENT SIDE

- BootStrap
- Kendo UI Framework
- jQuery Framework
- Custom-built Object-Oriented JavaScript
- TrimPath
- Chromium Embedded Framework (CEF)

AUTOMATE PLCS

- TwinCat Data communication library
- OPC Automation Library
- Mitsubishi Automation Library
- Data Communication Library

DATABASES

- SQL Server 2008 R2,
- SQL Server 2012 Express
- SSIS, SSAS

TOOLS

- Visual Studio 2015
- SQL Server Management Studio
- Internet Information Services
- Wix Tool Set for Packaging

TEST AUTOMATION DEVOPS

Test Automation

- NUNIT
- Telerik testing framework

DevOps

- Jenkins
- Sonar
- PowerShell
- MS build
- JFrog Artifactory
- Open Cover

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30+ PLANTS UP & RUNNING WITH PLANS FOR GLOBAL ROLLOUT

After two years of overcoming challenges and continuously improving upon established practices and processes, the customer's functional, all-in-one enterprise plant management platform is a testament to the success of a totally transformed project. Here are some of the key achievements from the project:

- 30+ plants are up and running in production in North America and Europe
- Customers using the platform are reporting decreased operational costs as a result of increased efficiency
- Releases have become more predictable in terms of scope, schedule and quality, resulting in increased customer confidence
- Automation coverage has improved and the redesigned regression suite has reduced regression duration from three weeks with 11 QA engineers to two weeks with just seven QA engineers
- Defects reopen rate has decreased from 35% at its highest point down to just 5%
- Unit test coverage has improved from a mere 20% to nearly 60%
- Single-click deployments have been enabled by the new DevOps pipeline

With EPAM's assistance, the customer plans to roll out the solution to 300 total customer plants by the end of 2018.

QUESTIONS?

Contact us at Sales@EPAM.com
or visit us at EPAM.com