GroupMT Masters Agile Manufacturing with Zend

CUSTOMER:

Group Material Technology (GroupMT) is a leading European innovator and supplier of quality and process management solutions for material and component processing in heat treatment and surface engineering.

CHALLENGE:

GroupMT needed a rapid application development platform with the power and ease of use to modernize its 'green screen' ERP system on IBM i for improved document management, manufacturing execution and other key functions across its 50 manufacturing plants.

SOLUTION:

GroupMT adopted the Zend PHP application development platform for IBM i, including Zend Studio IDE, Zend Server web application server, and Zend Framework, an open-source application framework.

Quality and Process Management Powered by PHP on IBM i

Ever since the Industrial Revolution made its mark on 18th and 19th century history, manufacturing has played a vital role in the health of the global economy. The manufacturing industry is vast, ever-changing and highly competitive. For GroupMT, a core tenet of market leadership is leveraging new information technologies to support its automated and agile manufacturing processes.

GroupMT is a leading European innovator and supplier of quality and process management solutions for material and component processing in heat treatment and surface engineering. Each year, GroupMT's 50 manufacturing plants process more than 200,000 different components with a total volume of more than 500 million items for customers in various industrial sectors including engineering, automotive, electronics, electrical engineering, aerospace, medical technology. To accomplish this herculean task, the company relies on a specially developed quality and process management system, which is powered by PHP on IBM i.

When Dr. Rainer Schmitz joined GroupMT several years ago as its head of IT, the company's ERP system was a green screen environment running on an IBM i5 system. A general lack of automation and ease of use made it difficult for plant personnel to access, manage and share data, project documents and reports for the 50 manufacturing plants. To leverage the power of the IBM i5 system, and modernize the company's ERP to meet business change, Rainer's team needed an open, flexible application development platform. The goal was to develop new applications quickly, without having to change underlying legacy code, and have the ability to work with rich documents and email in a seamless, automated way across the entire manufacturing operation. This was not an easy proposition given the traditional RPG programming environment on IBM i.

According to Rainer, "We chose Zend for the robust quality of its PHP application development platform, with application monitoring, troubleshooting and optimization capabilities as well as strong integration with IBM i." The first step taken by Rainer's group was to build a web application for simple reports on a Windows server, and connect it to the DB2 back-end database residing on the i5 system. He credits the well-supported PHP environment Zend provides on the IBM i for helping overcome problems his team encountered with the underlying ODBC connection.

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Dr. Rainer Schmitz, Head of IT, GroupMT

Rainer's group used Zend Studio IDE and Subversion (SVN) for development on the i5 system. For internet applications they then transferred their code to a Windows production system. "We established a complete native environment in which we can develop code, and then reuse it virtually anywhere across our manufacturing operations, independent of the target operating system chosen."

The first application was up and running in less than three months. To ensure consistency across all new applications being developed, Rainer's group adopted the Zend application framework, and set up a new PHP environment on IBM i that would enable them to build, extend and maintain better quality PHP applications more effectively over time.

To protect GroupMT's significant investment in a large inventory of capital equipment, the next order of business was to automate aspects of its maintenance. Using the Zend PHP stack, Rainer's group built the new PHP-based application, which automated key maintenance management processes for all production equipment used in the company's 50 manufacturing plants. "We began seeing positive results with improved maintenance scheduling and tracking across plant operations directly following the launch of our new application," said Rainer.

The third step was to build a document management application integrated with the organization's email system through a common graphical interface. This was critical because GroupMT's daily production planning meetings were consuming 200+ man-hours a month. The Zend PHP platform enabled rapid integration of GroupMT's document management application with email and production systems, and the handling of more than 20,000 documents per day across all plants.

"Now we have traceability and tracking of jobs in progress to ensure a well-coordinated chain of events. The resulting benefits include increased reporting accuracy, enhanced productivity, greener document management and significantly lower costs using Zend. And we've regained 10-12 man hours per day that can be focused on innovation and service. When these results are multiplied across 50 plants, the savings is quite significant."

Rainer's group wanted to track and analyze app performance more closely so they could eliminate bottlenecks and fine-tune where needed, so they built a new module that with one click could generate quick batch reports customized to specific needs rather than dumping out a lot of extraneous data to get the answers needed. For example, on the Zend PHP platform, GroupMT can now create original documents as PDFs and send them from a central location via a complete PHP print engine to any plant location. This can be done on any of the group's Windows and Linux servers and moved directly to IBM i, with no need for creating spool files and extra steps of the past.

Improved App Life Cycle Management with Zend Server

"Today, everything from development to production is done in PHP and managed by Zend Server. We can install Zend Server and be up and running in a minute, and then spin up 60-70 instances of Zend Server across our multi-plant manufacturing operations.

Document archiving has also evolved from a green screen environment with manual processes to a fully electronic process, and we are saving an amazing amount of time."

The most recent project for Rainer's group involves development of a Manufacturing Execution System (MES) interface between production systems and the ERP system, which manages receiving, incident handling, production control and other functions. As it is used on the shop floor it must be easy to use and fast. Rainer's team built the app using Zend PHP on IBM i, and optimized performance to reduce page loading time from 1-2 seconds to 50ms. The new MES app uses touch screens, runs on more than 100 Windows and Linux desktops, tablet PCs, and mobile barcode scanners; and connects to external cameras, scales, measurement devices and production control systems.

Reaping the Benefits of Automated Manufacturing Processes

"We can build a new release and switch over, with one link, in as little as 1 second using Zend Server. If Zend Server monitoring detects an error, we can roll back literally in a second. Zend Server's Code Tracing provides root cause diagnostics to help us identify the location and severity level of any issue, so we can decide on the spot whether or not we need to address it in real-time. We have achieved a reliable high availability manufacturing management environment thanks to our use of Zend and IBM i."

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"Our entire approach to this project and the technology foundation that we've built upon the Zend PHP on IBM i platform has inspired a new more collaborative approach to application development, with correct programming from the start. Previously manual and error-prone processes are now automated. And what we have is a custom application development platform that we can use throughout GroupMT manufacturing operations. We can sit down with our business users and discuss their process requirements, and then do our coding and testing to meet their needs. We can build once and run applications seamlessly across all 50 plants. As a result of this new and more agile approach, what used to take many months is reduced to days or weeks."