

MAGNA

Aras Accelerates Innovation at Magna Powertrain GETRAG

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Rolf Huesemann
PLM Project Manager,
Magna Powertrain GETRAG

Next Generation PLM Platform Transforms & Standardizes Processes Enterprise-wide

Implementing an enterprise-wide PLM platform in a global enterprise without using a small army of management consultants or investing millions – how is that possible?

Magna Powertrain's GETRAG division, headquartered in Cologne Germany, demonstrates how next generation PLM technology and a clear focus on business results make it quite possible.

PLM is a particularly important enterprise software solution to optimize global product development and supply chain business processes in the automotive Industry. For a single vehicle product or system, there are many complex interdependencies between the mechanical, electronics and electrical, software and firmware. Coordinating the work of personnel around the world is imperative, and having a common PLM platform with standard processes is critical to enabling global collaboration and worldwide coordination.

Magna Powertrain GETRAG's Systems

- ▶ **PLM:** Aras Innovator
- ▶ **PLM Database:** Microsoft SQL Server Enterprise Edition
- ▶ **CAD:** CATIA V5 and Pro/ENGINEER
- ▶ **Firmware:** PTC MKS Integrity
- ▶ **Software:** IBM ClearCase
- ▶ **Requirements:** IBM DOORS
- ▶ **ERP:** SAP

Utilizing an enterprise PLM solution provides numerous operational advantages and economic benefits to a global corporation such as a streamlined process, better cross-functional communication internally and with suppliers and partners, as well as greater product quality and timelier product launches.

PLM system projects are typically preceded by an in-depth business process re-engineering analysis and "as is / to be" planning phase. This is followed by a lengthy budget negotiation process and an actual implementation project which takes two or more years. By which time, in today's dynamic business environment, the original requirements of the company have changed substantially.

"Such a lengthy process was out of the question for us" explains Rolf Huesemann, the PLM project manager. "Our business requirements must be implemented in weeks not years. Our business strategy can't wait for an extended IT process that results in a 'big bang' systems implementation. That's why we started with small, high impact projects based on Aras to support specific processes that are critical to our competitiveness."

Background & Challenges

Previously, the company began to deploy a conventional PDM system in engineering with the intent to convert to a broader enterprise-wide PLM scope over time. In the design organization the CAD designers used CATIA V5. The functionality necessary to move from PDM for CAD file management to the global PLM scale required linking all of the product-related documents with the multi-discipline bill of materials for each transmission system, however, this proved overly complicated and financially infeasible. The PDM to PLM deployment was forced to stop due to the implementation complexities and the significant PLM licensing expenses that would be incurred with the addition of the required PLM modules and the vast number of users across the enterprise.

Delivering Rapid Results

Then, the team learned of Aras and began to conduct an evaluation. The IT group was quickly able to prototype global processes and complex product structures with relationships to product information across mechanical, electrical and electronics as well as software and firmware. By mid 2010, the conversion project from PDM to PLM was back underway, involving the replacement of a proprietary drawing system as well as a budget and sales administration system.

"With Aras, we clearly saw how fast and efficiently we were able to prototype complex processes that supported very specialized requirements for our competitive practices," Huesemann explained. "We then continued to incrementally expand the Aras solution in cooperation with different groups across the company. Right away in the initial phase, people recognized the process benefits of Aras and the PLM project gained user acceptance and momentum." The incremental approach to the PLM implementation of applications got personnel engaged in the process

early and resulted in greater ownership. It moved so quickly that, for example, the capacity of the IT and technical groups became the gating factor. IT personnel raced to keep up with the business employees as they continued to discover enhancement opportunities in Aras.

Retiring Legacy Systems

In the manufacturing plants on the shop floor and in the equipment and tooling departments the drawings, set-up instructions and maintenance procedures for machines and tooling were isolated in three separate stand-alone, legacy document management systems (DMS). Mechanical engineers, tooling engineers and maintenance personnel lacked online access and did not have context about the products, systems and parts that the equipment was designed to support. Engineering changes to products were not directly tied to tooling and equipment resulting in unnecessary production line downtime which was particularly costly given the high volume environment.

Rolf Huesemann explains how the decision was made to use Aras to replace the DMS systems, "We analyzed the current situation in the plants and got competitive quotes for upgrading the DMS systems or extending Aras to replace the specialized configurations of the different DMSs. We were surprised when the DMS and PLM options came back with comparable prices because we had expected the PLM option to be more."

The decision for Aras was made because there would be no additional licensing costs and the company would gain direct connectivity to other corporate-wide processes. By consolidating all three DMS systems into Aras employees would have centralized online access to all 4,500 drawings and 20,000 files. The flexibility of Aras enabled the fast migration of the complex rules and procedures that were in the DMS systems, and IT was able to complete the replacement of the first DMS quickly. Next, the other two DMS systems in the Halewood England and Bordeaux France manufacturing plants were also replaced with Aras.

Streamlining Global Process

The next processes that were automated were the prototype approval process and budget planning process for product development. Both of these processes involved complicated workflows and were manually performed using Excel which was time consuming and mistake prone, since they involved a wide variety of different personnel from across the company including engineering, operations, procurement, finance, sales and the product development project management office (PMO).

In the prototype approval process a single project can require 20 or more different sign-offs, and there are typically between 100 and 200 projects that are active simultaneously. The volume of concurrent review and approval activities was creating significant strains on the business resulting in missed deadlines and new product delays. The PLM team recognized the opportunity for improved workflow automation connected with supporting product data for better context. In a matter of weeks the process flows and business rules were implemented and rolled out. The flexibility of Aras allowed for the simplification of a very complex form with multiple contributing participants throughout the process and a flexible workflow depending on product type. The new streamlined prototype approval process has reduced cycle time and improved the ability to meet tight deadlines for new product launch.

The budget planning process involved very complex data structure requirements with multiple workflows and sophisticated reporting. The process spans product development, accounting and finance, sales and the PMO across multiple sites and product lines. Using Aras, a roles-based view of the process was implemented to simplify the complex data contributions at numerous steps. Each employee can access the budget analysis and forecast planning to collaborate on the business plan. Additional functionality maps specific projects across each department, for example product design or software development, and work hours can be estimated and added by individual employees. By systematizing the process and including business rules with one click reporting, budgets are now easier to compile and more accurate for better predictability of costs and new business profitability.

Functionality including software release planning, bug tracking, issue management, test planning and management, task tracking and reporting were automated and integrated in the overall enterprise PLM. Agile methodologies combined with the manufacturer's competitive practices in a multi-site development environment required a sophisticated data model.

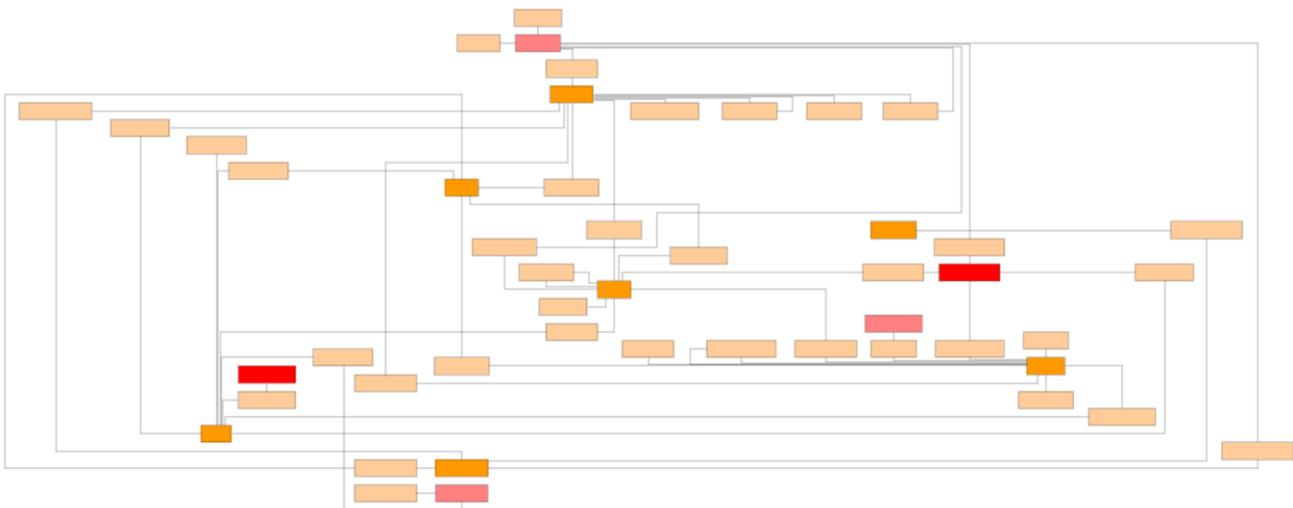
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Global PLM with Aras

- ▶ CAD Data Management for CATIA V5 and Creo
- ▶ Document Management of 4,500 Drawings and 20,000 Files
- ▶ Integrated Application Lifecycle Management (ALM) for Software & Firmware
- ▶ Product Development Budget Planning Process
- ▶ Enterprise-wide CAPA Process with 8D
- ▶ Prototype Approval Process

Integrated Application Lifecycle Management in PLM

In addition to the mechanical design and all the electronics involved in today's modern transmissions systems, such as a dual clutch transmission system, there is a substantial amount of software and firmware. To develop these increasingly complex products, different departments with very different working styles, practices, processes and applications must work together effectively to create new and innovative products. Recognizing the need for multi-discipline synchronization, the Magna Powertrain GETRAG division extended Aras to support the Application Lifecycle Management (ALM) of the



Complex data model in enterprise PLM supports Agile methodologies with the company's specific competitive practices in a multi-site environment

embedded software and firmware for the transmissions.

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Today Aras is the central key to coordinating the overall development process. Developers plan their tasks, for example recording requirements, and move through workflows in the PLM solution. The requirements, from system-level to detailed technical, then flow through to the existing IBM DOORS environment. When the task of satisfying a requirement is completed, it is closed out in IBM DOORS which is reflected in the PLM solution and the project manager is notified.

The concurrent versioning of the source code configurations are handled in IBM's ClearCase and PTC's MKS Integrity which are being connected to Aras. This provides secure, best of breed connectivity to the overall global product development process and comprehensive capabilities for managing the complexity of the company's next generation products and systems.

To deliver these specialized ALM capabilities, the Magna Powertrain's GETRAG division project team used an incremental implementation approach and chose to combine long standing best of breed systems with Aras in order to optimize the process and facilitate adoption. This added value to the existing business processes without disrupting the developers.

Cross functional data, relevant to different organizations and to the overall transmission system, is managed in Aras. This ensures that engineers worldwide are working with up to date and approved product information while allowing the software developers to work in their system of choice. The combined solution has been so successful that it is being rolled out across the global corporate environment.

Rolf Huesemann describes the reaction: "Our motto on the PLM team is to 'encourage not enforce'. As our engineers experienced the advantages of the cross-functional solution, it was easy for them to change to the new Aras solution."

CAPA with 8D Handling

Previously, resolving quality issues lacked online automation and manual processes were isolated at each site. The division of Magna Powertrain GETRAG applied Aras to the corrective and preventive action process (CAPA) with the popular 8D method that is

widely used in the automotive industry. The solution captures information and documentation at each step in the process. Each product failure, nonconformance and issue are traced back to the root cause and corrected permanently. The 8D report, including all the investigative measures and data used to identify root cause, is accessible across the company and can be used for business intelligence on quality issues. The CAPA application was initially rolled out to a core group of 100 employees to get adoption and is now available to over 3,500 employees worldwide across all of the company's sites.

Aras Implementation Methodology

“Our incremental implementation approach has been very successful,” concludes Huesemann. “The Agile-style application deployment encourages us to work together with the different business groups and we get buy-in that way. We gather the high level requirements quickly and can implement working software in a matter of days for users to review and give us feedback right away. It's such an efficient process because we can adjust our customizations immediately based on their responses,” explains Huesemann. “The Aras platform is used not just to automate, but to develop new business processes. As a result our company can react much more rapidly to customer demands and market conditions than in the past. The upshot is that because of Aras our business has gained flexibility, speed and efficiency.”

In the future, Rolf Huesemann intends to continue to expand the Aras deployment. His plan is to use the same level of internal resources; 1-2 full time PLM team members and 3-4 people part time. Each person received one (1) week of training on Aras and then started with a simple project run in the “agile” way. The Aras technology is relatively easy for an experienced software developer or systems architect.

The core team is responsible for customizing, developing and maintaining the PLM environment with external resources from Aras and T-Systems providing architectural guidance and deep expertise for particularly complicated situations and complex integrations. This way the PLM expertise resides within the organization.

“If we first have to explain our business to external consultants, it's more time consuming, expensive and

risky than if our own experts develop with Aras to support our specific processes requirement,” Huesemann concludes.

Further Expansion

Over 400 employees in Germany, Sweden, the UK and France are all frequent Aras users with access for over 3,500 worldwide. Aras is being further expanded to replace another legacy PDM system and will take over data management for PTC's Pro/ENGINEER as well as enterprise change management. Additional projects include rolling out the CATIA V5 data management capabilities to the parent company worldwide. In the future, the target is to continue to bring more processes into the global Aras environment and retire additional legacy systems creating a highly specialized PLM infrastructure across the full lifecycle with Aras and SAP together as the enterprise-wide corporate platforms.

Magna Background

Magna is a leading global automotive supplier with 285 manufacturing operations and 83 product development, engineering and sales centers in 29 countries. Magna has over 125,000 employees focused on delivering superior value to customers through innovative processes and World Class Manufacturing.

About Aras

Aras® offers the best Product Lifecycle Management (PLM) software for global businesses with complex products and processes. Advanced PLM platform technology makes Aras more scalable, flexible and resilient for the world's largest organizations, and a full set of applications provide complete functionality for companies of all sizes.

By rethinking the way PLM is designed, Aras has taken a fundamentally different approach with a focus on the Business of Engineering. Aras solutions support processes for global product development, systems engineering, multi-site manufacturing, supply chain, quality and more.

Companies running Aras include Airbus, Boeing, Bombardier, GE, Hitachi, Honda, Kawasaki, Magna, Microsoft, Motorola, Nissan, TOSHIBA, Xerox, the US Army and hundreds of others worldwide.



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