



PTC Integrity Drives Worldwide Collaboration and Product Innovation at BWI Group

BWI Group



The PTC Integrity platform was the enabling tool that allowed us to transform the way we do business.”

Beijing West Industries (BWI Group) is a premier chassis supplier that designs and manufactures brake and suspension systems for the global transportation market. The company started as Dayton Engineering Laboratory Company (Delco), in Dayton, Ohio. In 1927, Delco Products was created as part of General Motors (GM) and focused on automotive suspension products.

In the 1990's, Delco Moraine — a sister division manufacturing automotive brakes — merged with Delco Products and Delco Chassis was formed. When GM spun-off part of their component business in 1999, Delco Chassis became Delphi Chassis.

In 2009, BWI Group acquired Delphi Corporation's suspension and brake businesses (formerly known as Delphi Chassis Systems). Today, BWI Group's Controlled Suspensions business supplies to many global automotive and motorcycle OEMs including General Motors, Jaguar-Land Rover, Audi and Ferrari.

Background

After the acquisition, BWI Group was faced with the challenge of selecting a new Application Lifecycle Management (ALM) solution as they were no longer able to use the ALM tools employed by Delphi Corp.

BWI Group embarked on an extensive study of the industry leading software ALM tools with the objective of balancing BWI Group's business needs with overall tool cost.

Executive Summary

One of the suspension group's most innovative solutions, MagneRide, is a software-driven auto-sensing system available on high-end vehicles that adapts to changing road conditions. This group also produces electronic control units (ECUs) managed by software containing over 500,000 lines of code — the core system is the basis for many different product variants that are rolled out to OEMs across the globe. OEM partners require automotive SPICE compliance to ensure quality.

The BWI Group suspension software team wanted a single solution to manage all aspects of the software development process: requirements management, configuration management, change management, and test management. A primary goal was to increase the level of abstraction in the design process to move from reaction and slogging through low level details to managing the entire design. Due to the volume and complexity of software, a solution that could easily accommodate change requests, provide traceability, and allow reuse of engineering artifacts was required.

The BWI Group's engineering organization spans multiple global sites, so latency and bandwidth issues were a major concern. With large files constantly going back and forth between the two sites, a high-performance solution that allowed collaboration and visibility across the organization was essential. As a small company in a competitive market with many high-profile OEM customers, there was pressure to streamline cost and minimize headcount while continuing to add new products, models and features — all without sacrificing quality or compromising safety.

The suspension group performed an evaluation of five ALM solutions, narrowed the list to two, and then conducted in-depth demonstrations — ultimately selecting PTC Integrity. PTC's winning solution addressed the basic need for a high performance, end-to-end engineering solution, and also provided unparalleled flexibility, configurability, and scalability to support growth objectives.

Mark DePoyster, BWI's Manager, ECU Core Engineering summed it up, "There were many reasons why we chose PTC Integrity, but a huge factor was that PTC Integrity could be configured to match our process — as opposed to the other alternatives that required us to change our process to fit the tool."

Challenges

With growing demands and a fixed budget, BWI Group needed an ALM solution that could quickly demonstrate payback to management by addressing many of challenges they faced as the business grew:

- Spice compliance mandated by OEMs; without an automated tool, this would require that volumes of documentation be manually generated
- Manual tracking of defects back to release notes or code itself was too time-consuming
- A way to track why a change was made or who made it, as well as easily link to source code to view differences
- Bandwidth issues arising from sharing code modules across locations around the world
- Productivity impact due to engineers having to wait for files to be transferred and synchronized across geographies
- Difficulty propagating changes throughout shared ECU code
- Duplication of effort in requirements, test plans and source code for shared software
- More complex requirements requiring more software
- New documentation and traceability requirements
- Needed a tool that would demonstrate ROI quickly

Solution

PTC Integrity was configured to support their development process and link together all engineering disciplines without requiring any custom integration work. As a result, the implementation was accomplished in less than 40 project days without any additional headcount. With PTC Integrity's configuration and change management capabilities, the suspension group is able to create a core ECU system with base software from which they can reuse shared artifacts and easily create variants.



“Prior to implementing PTC Integrity we were forced to execute projects sequentially, one by one. We can now work on up to 5 projects in parallel. We are able to develop a core solution and create variants of that product based on different OEM requirements. The automated software change request process allows us to quickly determine the impact of the change on multiple products.”

Another significant improvement to BWI Group’s software development process was realized in PTC Integrity’s ability to capture and document all configuration and change history throughout the product lifecycle. Defects can be easily traced back to the source. Software Change Requests (SCRs) spawn changes in related projects so that any change is propagated to all affected ECUs. This enables them to handle multiple projects at the same time by increasing both productivity and efficiency. Because of end-to-end traceability, quality has been improved, compliance reporting has been simplified, and new products can be brought to market more quickly.

“Since implementing PTC Integrity, we have been able to bring important software development back in house which enabled us to redesign our electronics and embedded software and damper design to improve response time and performance — which translates into new business for us. We have improved our competitiveness without any additional cost. Without Integrity we couldn’t have done this without adding a ton of people.”

With engineering resources that are geographically dispersed, PTC Integrity has overcome bandwidth and latency issues, allowing BWI Group to easily share large files and collaborate over distance without any delays or downtime. Engineers see a snapshot of the product in real-time and can create their own software development “sandboxes” without impacting production code, enabling multiple engineers to work on the code at the same time.

The implementation of PTC Integrity has enabled BWI Group to more efficiently manage and support their internal software development process, enabling them to be more competitive and to adapt more quickly to changing business conditions. By designing, managing and supporting the software internally, they are more competitive and can adapt to changing business conditions more quickly. Using PTC Integrity to handle all the details of the engineering process provides the ability to see the bigger picture which results in better decisions. As a result, the suspension group is winning more business and increasing profits.

Results

PTC Integrity is a key factor in the following results (with no additional budget or headcount):

- 75% ECU software development done in-house
- 90% of software defects are found before passing software to OEM partners – improved software quality through better traceability
- Multiple projects can be done in parallel (rather than 1-2 before) improving productivity and time-to-market

- Automated impact analysis identifies defects and where they occur
- Tripled the number applications developed in the same amount of time
- Well positioned to achieve SPICE compliance in critical areas such as configuration management, change request management, and problem resolution management

Next Steps

BWI Group continues to improve their software development processes to keep up with the increasing demands of automotive OEMs, and PTC Integrity continues to be a critical element in BWI Group's future success in achieving higher levels of SPICE compliance and meeting the expectations of their customers.

"After implementing PTC Integrity, we are better able to proactively manage our software development than we were previously. We also now have much broader visibility of changes by the global software engineering team which significantly increases our productivity and reduces the probability of introducing unintended consequences with changes to the code."

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