Improve Efficiency of Managing Requirements Using Digital Product Traceability

Customers want to feel secure that the car they just bought will stop safely when the brakes are applied. They want their pacemakers to continue to keep them healthy for years to come. To ensure customer safety and satisfaction, industry players have requirements placed on them that force them to adhere to industry standards.

Agreeing to adhere to these industry requirements is easy but ensuring that your product continues to meet them while it is designed, manufactured, and serviced can be a challenge. You must be able to determine all requirements are satisfied and that each individual component of the product is compliant with industry regulations and standards. Many unexpected changes can occur during the development process such as changing business climates, shifting priorities, and evolving environments. These changes may have a potential impact on the final deliverable or other aspects of the project.

Digital Product Traceability

Digital Product Traceability is needed to maintain compliance throughout the product lifecycle and to ensure appropriate impact analysis was performed with each change made on the product.

Maintaining this digital thread enables you to view information in context, rapidly evaluate the impact of changes, enable compliance, and identify the root cause of problems in the field. Conversely, Digital Product Traceability makes it possible to look forward and determine what sort of impact a modification will have on a product down the road.
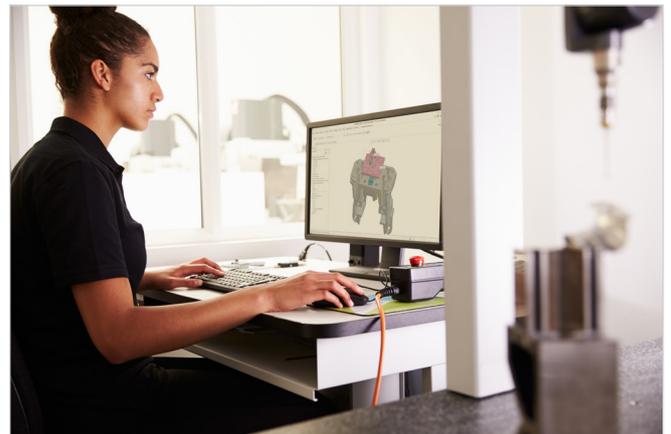
A Computer on Wheels: Hitachi Automotive Systems

The vehicle you drive is not your grandmother's car. Today's average automobile features a host of high-tech features that make your car less of a conveyance from place to place and more of a computer on wheels. While these features are exciting for consumers, they make engineering and manufacturing new vehicles a bit more complicated – and more high-stakes should any of these features malfunction.

To ensure passenger safety, the automotive industry has imposed safety standards such as ISO 26262 - the international standard for functional safety of electrical and electronic systems used in automobiles. ISO 26262 provides an automotive safety lifecycle and covers functional safety aspects throughout the entire development process.

Hitachi Automotive Systems – which manufactures engine management, electric power train, drive control, and car information systems for major automotive original equipment manufacturers -- fell under these industry regulations. Luckily, Hitachi has stringent internal quality management requirements that meant it was already meeting the main requirements of ISO 26262. However, it still had some gaps to fill to become totally compliant. Hitachi needed to determine a way to trace requirements compliance through its products' entire lifecycles.

"We can... use Excel for traceability management. However, if there are more items and the hierarchy goes deeper, then, of course, management becomes more complex. Also, if the requirements change, it's necessary to identify the entire scope affected by that change and verify countermeasures," said Yoshihiro Miyazaki, Supervisor for Electronic Platform Technology and Head Technician for the Technology Development Department at Hitachi. "As a result, this lowers our development efficiency and increases development costs. To succeed in increasingly fierce global competition, we needed to ensure traceability for requirements, including functional safety, and to introduce tools that further increase our software quality and development efficiency."

To achieve this, Hitachi invested in PTC's Requirements and Validation solution. Powered by PTC's Integrity product family, the Requirements and Validation solution enables teams to specify, define, verify, and validate requirements across the product engineering lifecycle. It offers end-to-end traceability to reduce risk and comprehensive change and audit management to protect strategic assets while simplifying regulatory reporting. Through rich data synchronization, the solution supports safe and flexible collaboration across teams and complex supply chains to speed product delivery and maximize customer satisfaction.

PTC's Digital Engineering Transformational Journey

Whatever the current state of your products and systems, you can take action to lower costs, gain insight into performance, and achieve greater customer satisfaction. PTC's Digital Engineering Transformational Journey playbook includes three simple steps to competing and succeeding in the IoT era:

1. Understand your products, processes, and systems today by gathering data
2. Advance activities and technologies to deliver new value for smart, connected products throughout their lifecycle
3. Outperform by achieving unprecedented results through proactive decision-making and simulation based on real-time product usage and performance analytics.
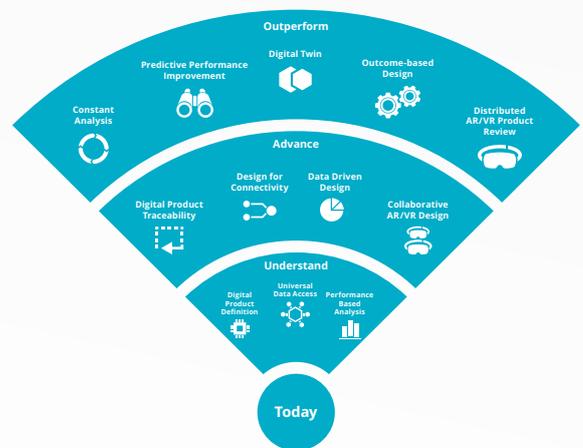
Visit PTC.com/en/digital-engineering to discover how to get started on your own Digital Engineering Journey today.

Using PTC's Requirements and Validation solution, Hitachi was able to link all managed requirements, specifications, source codes, and test cases – as well as manage these items in a traceable format. Not only did this ensure traceability throughout the product lifecycle, but it also made it possible to quickly check that the product's software was fulfilling its safety requirements.

The results from using PTC over Excel were staggering. Comparing time spent managing the traceability of safety requirements, Miyazaki found that:

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Using Excel, it took about 40 hours, but with PTC [Requirements and Validation], we were able to complete it in about 8 hours."

Yoshihiro Miyazaki
Supervisor for Electronic Platform Technology, Hitachi

Learn more

Want to discover how PTC's Requirements and Validation solution can help your organization achieve Digital Product Traceability? Visit PTC.com.