aras corp®

The Disconnected Product Lifecycle: Why Your Business Needs the **Digital Thread**

WHAT IS THE DIGITAL THREAD?

The connections that allow engineers to digitally follow a product and its digital assets, from initial capability planning and analysis, through design, manufacturing, testing, and on to final sustainment and disposal phases is called the Digital Thread. The Digital Thread gives an integrated view of a product (asset) throughout the product lifecycle and across disciplines. With full product lifecycle traceability, teams across the enterprise are empowered to work concurrently with the latest product information.

The Digital Thread allows companies to connect product information generated by a multitude of product functions including:

- product requirements
- simulation models
- electronics and embedded software
- manufacturing process plans
- internet of things
- service records

WHY DO COMPANIES NEED THE DIGITAL THREAD?

The exponential growth of product complexity has surfaced the inadequacies of legacy systems and product processes. Currently, IT architectures and existing systems cannot coordinate product development across engineering disciplines – mechanical, electrical, and software – or throughout the entire product lifecycle.

To set the foundation for growth in this era of complex connected products, manufacturers must rethink business processes and connect siloed systems. They are turning to a modern, platform-based approach that enables them to quickly change and evolve product processes as their business needs change. The result of connecting processes and systems is full product lifecycle traceability and creation of Digital Thread capability.

GE Aviation

GE AVIATION CASE STUDY

Creating a Digital Thread Between Engineering and Manufacturing

GE Aviation is a world-leading provider of commercial, military and business and general aviation jet and turboprop engines and components as well as avionics, electrical power and mechanical systems for aircraft.

A typical airline engine can contain some 25,000 parts and manufacture can take up to two years. These engines need to be built with a low tolerance for error and require highly skilled engineers and manufacturing talent in people, processes, and technology.

GE Aviation

Problem:

GE Aviation was relying on manual processes to translate engineering change into manufacturing change. They lacked a business system to cascade engineering change orders (ECOs) into manufacturing change orders (MCOs). The underlying engineering bill of materials (EBOM) was not synchronized with the manufacturing bill of materials (MBOM). The company needed to reduce failures in downstream quality testing.

Solution:

Using the Aras PLM Platform, GE Aviation built a solution to synchronize translation of EBOM MBOM across multiple legacy manufacturing systems and multiple locations. The result was a traceable Digital Thread between engineering and manufacturing functions.

Using their new system to connect and federate their product processes, GE Aviation was able to integrate Engineering and Manufacturing for full visibility on decisions and impact of changes.

Results:

62% reduction in changes to analyze

82% less data entry – eliminating spreadsheets & siloed data

80% reduction in tools

Organizations that understand the power of being able to manage a product's configuration throughout its lifetime gain a significant advantage through:

On time product launches.
According to LNS Research, tapping into the Digital Thread, capturing knowledge "with a unified experience that leverages modern technology such as cloud, mobility and big data analytics"– earned significant payoffs, helping manufacturers to experience a 16% improvement in OTCS (on-time and complete shipments), and 20% in SNPI (successful new product introductions).

Improved product quality.
Manufacturers must be able to manage change across the enterprise, including the ability to distinguish critical versus non-critical change, to minimize error impacting quality. With full product lifecycle traceability, companies can understand the impact of change and make sure all affected items are addressed and updated. For example, one change may affect a current product in process as well as multiple versions in different stages of the lifecycle.

Better support for "Smart Connected" products in the field.
The new and growing world of "smart" products requires a new way of managing complexity. Companies are building assets for specific regions and applications resulting in different field configurations. The Digital Thread enables the ability to track various product configurations and connect assets "as built" to "as maintained." This avoids inefficiencies, delays, and the cost of downtime while trying to uphold Service Level Agreements for guaranteed performance and uptime.

Future-proofed application architecture.
Only an open Product Innovation Platform can fully manage a Digital Thread across systems and geographic boundaries, persisting data for years, presenting it in a usable way, controlling access, and respecting configuration rules.

Legacy systems implemented to manage product lifecycle lack flexibility and were not built for today's product complexity. They are typically heavily-customized and are difficult to change once they've been set up. This means that as business processes change, these systems get harder to use.

LAYING THE FOUNDATION FOR **DIGITAL TWIN**

Digital Twin is a complete digital model of a specific product instance (e.g., a product serial number or tail number) that can be used to simulate and analyze an asset, or system of assets. A Digital Twin provides valuable insights into the use of a product asset in order to improve performance and business processes – from engineering to manufacturing to operations – throughout the entire product lifecycle.

A Digital Twin is the sum of product lifecycle data that only the Digital Thread can provide. Without full product lifecycle traceability, a Digital Twin is not a Digital Twin.
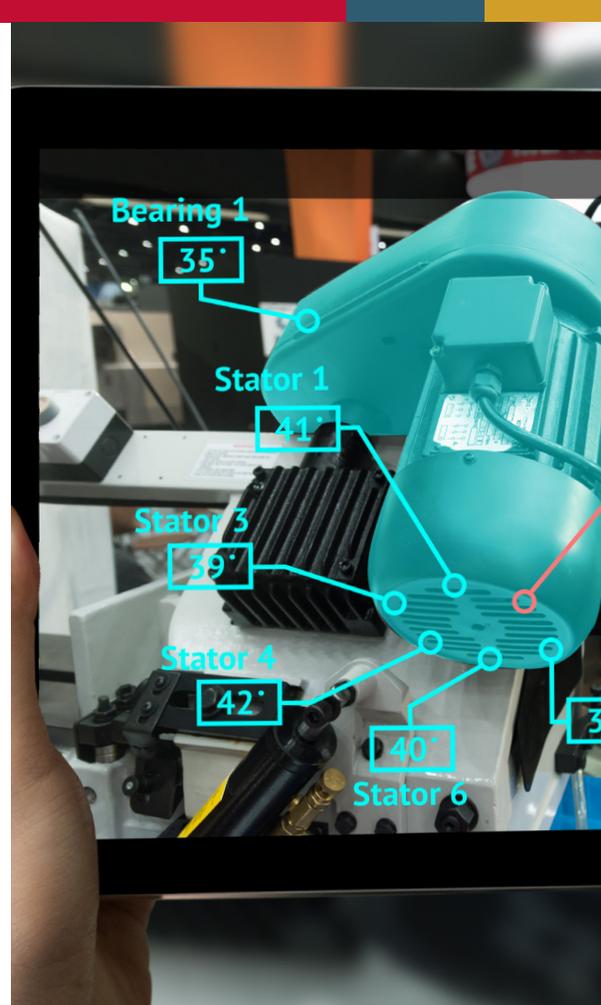
ARAS IS **DIFFERENT**

Our software can carry forward all customizations forever, upgradeable to the next version, and the software can be easily changed to match your needs as the business changes. Plus, it works with legacy systems, so there's never a need to "rip and replace".

Aras enables the world's leading manufacturers of complex, connected products to transform their product lifecycle processes and gain a competitive edge. Aras' open, flexible, scalable, and upgradable PLM platform and applications connect users in all disciplines and functions to critical product information and processes across the extended enterprise.

Aras customers include Airbus, BAE Systems, GE, GM, Hitachi, Honda, Kawasaki Heavy Industries, and Microsoft.

For more information about how Aras and The Digital Thread can help you unlock your legacy PLM:

GE Aviation & Aras PLM

White Paper: Product Complexity, Digital Transformation, and the Innovation Imperative

GE Aviation: EBOM / MBOM with Affected Items, Impact Matrix, Effectivity & More