Synergize Manufacturing Process Integrating Product Design, Maintenance, and Quality Management with ProdWeaver Digital Thread

The manufacturing industry is at a tipping point where efficiency alone no longer guarantees success. A complex regulatory/compliance environment, fragmented systems, rising competitiveness, inefficient workflows, increased customer expectations and recurring quality issues have opened new gaps in the product lifecycle.

A unified data ecosystem, which connects every aspect of the product lifecycle, from inception to post-sales support is the need of the hour. Digital threads provide a transformative solution to the above challenges by integrating IT, OT, and ET systems to enable real-time traceability, seamless collaboration, and automated workflows across the product lifecycle.

The result is reduced time-to-market, improved compliance, and enhanced product quality—empowering manufacturers to achieve operational excellence in today's competitive environment.

ProdWeaver Digital Thread Solution

ProdWeaver is a digital thread solution that enables manufacturers to inject agility into the end-to-end product life cycle by seamlessly unifying critical functions, bridging IT, OT, and ET systems for end-to-end traceability, and integrating product, process, and design digital twins to build a connected ecosystem that enables consistent iterations, seamless collaboration, and real-time decision-making.

Functions:

- **Design, engineering, and quality:** Ensure data consistency from concept to production.

- **Manufacturing Operations, maintenance, services and repair:** Link real-time machine and process data for actionable insights.

- **Compliance and supply chain:** Establish SSOT across regulatory and operational workflows.

30-50%	15 - 30%	15 - 30%	20- 40%
lower product development cost	faster time to market	productivity improvement	higher service efficiency

ProdWeaver Digital Thread: Key Use Cases

Product Design Optimization

- Centralizes design and engineering data with end-to-end traceability.
- Leverages AI to optimize workflows and identify reusable components.
- Provides real-time collaboration tools for design teams.

Impact

- Faster product development
- Reduced rework
- Higher design efficiency

Regulatory Compliance

- Consolidates regulatory, quality, and production data into a single source of truth.
- Automates compliance tracking, reporting, and audit preparation.
- Dynamically links regulatory requirements to design controls for real-time updates.

Impact

- Streamlined compliance processes
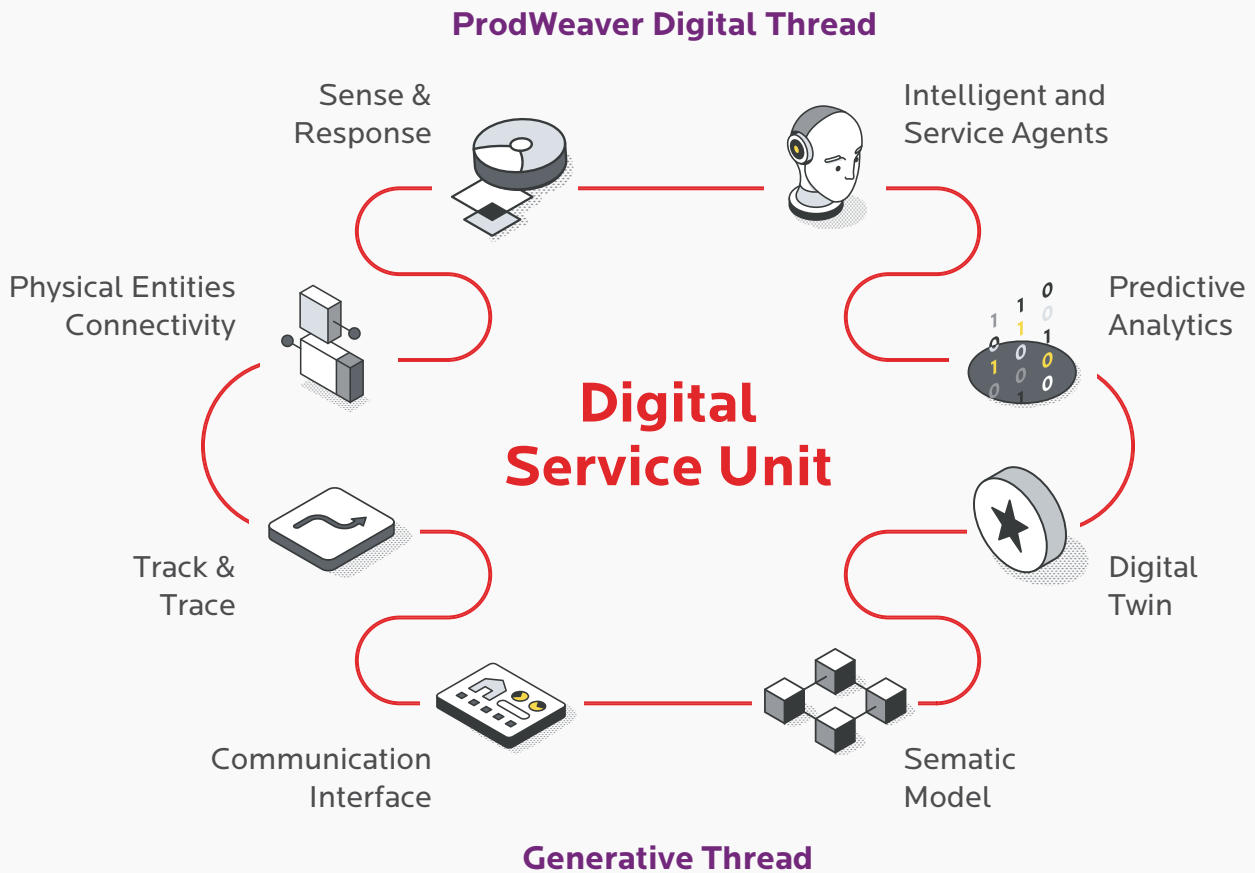- Faster certification
- Reduced regulatory risk

Maintenance, Service and Repairs Optimization

- Predictive analytics and IoT data to forecast equipment failures.
- Optimizes maintenance schedules to maximize asset lifespan.
- Integrates machine and operational data for proactive interventions.
- Meantime between failures to repairs
- Efficient maintenance planning and scheduling

Impact

- Higher equipment uptime
- Lower maintenance costs
- Improved resource efficiency

Comprehensive capabilities to orchestrate a connected product life cycle

ProdWeaver Digital Thread

Sense & Response

Intelligent and Service Agents

Physical Entities Connectivity

Predictive Analytics

Digital Service Unit

Track & Trace

Digital Twin

Communication Interface

Sematic Model

Generative Thread

Bring sentience to your product life cycle with Generative AI capabilities

AI-Driven Design Recommendations
Optimize product designs by automating iterative processes and identifying reusable components.

Intelligent test plan reuse
Leverages AI to identify similarities across design models and testing scenarios, speeding up development cycles.

Dynamic risk analysis
Predicts operational and compliance risks using AI, providing actionable insights to mitigate potential issues.

Automated change management
Analyzes design and engineering changes in real-time, assessing downstream impacts for faster, more informed decisions.

ProdWeaver in Action

	Business Challenges	Birlasoft Solution	Business Benefits
Enhancing process efficiency with Digital Twins and Generative AI for the world's largest three-wheeler and motorcycle manufacturer	The client faced challenges like frequent process disruptions, limited ability to address root causes of issues, and lack of coordinated approach to align human, machine and process operations.	The ProdWeaver solution implemented Digital Twins for real-time monitoring and simulation across 23 processes at 14 locations. It effectively used Generative AI for proactive fault rectification and process optimization. This enabled seamless human-machine coordination with robust decision support systems.	**30%** reduced rejection **15%** lesser scrap **40%** reduced rework
Product Design Acceleration: Predictive Machine Learning & Generative AI for a Top 15 Indian Tyre Manufacturer	The client aimed to speed up the tyre design and approval process for new variants by reducing turnaround time and iterations. They also wanted to optimize their existing application for better navigation and efficiency using a Generative AI-based solution.	Implemented data lake analytics, model, and algorithm baselining. Applied Predictive Analytics to prescribe the right recipe for new tyre variants. Used Generative AI to build an intuitive user interface, real-time optimization, and advanced search algorithms. Developed search algorithms with continuous learning and retraining.	▸ Self-learning, intelligent, and autonomous tyre design parameter generation. ▸ Accelerated go-to-market due to a faster design-to-production cycle.

Scale the power of digital threads within your manufacturing organization.

Get in touch to see how we can help you realize transformative outcomes with ProdWeaver.

Empowered by Innnovation

Birlasoft combines the power of domain, enterprise, and digital technologies to reimagine business processes for customers and their ecosystem. Its consultative and design thinking approach makes societies more productive by helping customers run businesses. As part of the multibillion-dollar diversified CK Birla Group, Birlasoft with its 12,500+ professionals, is committed to continuing the Group's 161 year heritage of building sustainable communities.

contactus@birlasoft.com

birlasoft.com

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