

Plataine & Composite Technology Center “Industrial IoT creates continuous improvement in tomorrow’s factory”

CTC Stade (Composite Technology Center GmbH, Stade) operates and simulates Plataine’s Industrial Internet Production Optimization solutions and examines the opportunities that reside within technologies such as Industry 4.0, Industrial IoT (Internet of Things) and cloud computing to drive the development of series production technologies for the manufacturing of composites components for aircraft construction. Here’s a look at this collaboration.

with

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JEC Composites Magazine: Can you briefly introduce your two companies?

AVNER BEN-BASSAT: Plataine is an award-winning, leading provider of Intelligent Automation software for advanced manufacturers, leveraging IoT and Artificial Intelligence Technologies. Plataine’s Total Production Optimization (TPO) solutions bring the world of IoT to composite part fabrication and leverage patent-protected technologies, to enable manufacturers to significantly improve their Buy-to-Fly ratios. Plataine’s solutions are used worldwide by leading OEM, Tier 1 & 2 suppliers including GE Aviation, Hitco/Avcorp, IAI (Israel Aerospace Industries), MT Aerospace. Plataine is a Siemens PLM Foundation Partner and a GE Digital (Predix) Partner.

PROF. DR. AXEL HERRMANN: CTC, Composite Technology Center GmbH Stade, Germany, is an Airbus company which is driving the development of efficient series production technologies for the manufacturing and assembly of carbon fiber reinforced plastic (CFRP) components for aircraft and lightweight construction. CTC Stade drives innovation in composite manufacturing to enable Airbus to maintain its top position as a leading aircraft manufacturer.

JCM: What solutions do Plataine offer concerning composite materials and their specificities?

A. B.-B.: Plataine leverages IoT and Artificial Intelligence technologies to offer a new software intelligence layer that sits

between ERP, PLM/CAD and the shop-floor. Plataine’s TPO platform allows manufacturers to track critical assets, provide instant alerts, and generate reports and analytics to give you total control over your manufacturing processes.

Context-aware actions and recommendations in real-time dramatically increase worker productivity. Our TPO solution holistically evaluates any stream of customer or internal work orders, for product mix and volume for a given time-period, to produce ready-to-cut dynamic production plans and streamline operations.

Context-aware actions and recommendations in real-time dramatically increase worker productivity



Additionally, Plataine maintains full traceability of the digital thread from raw material to end product to guarantee quality is never compromised.

JCM: How did your collaboration start?

PR. DR. A. H.: We were introduced to

Plataine by one of our consulting partners and after getting to know Plataine’s solutions and surveying the market, decided that Plataine is the perfect partner for us to step into the topic of Industry 4.0. Following that, CTC and Plataine Technologies have signed a Cooperation Agreement to deeply examine Plataine’s solutions and the opportunities that reside within state-of-the-art technologies such as Industry 4.0, Industrial IoT (Internet of Things) and cloud computing, to drive the development of series production technologies for the manufacturing of composites components for aircraft construction. CTC Stade operates and simulates Plataine’s Industrial Internet Production Optimization solutions as part of its effort to maintain competitive advantage by driving innovation and advanced technologies to the Aerospace Community.

JCM: What advantages does Plataine’s solution propose to composites component manufacturers in the aeronautics field?

A. B.-B.: Plataine’s TPO solution is able



Materials and parts tracking allow final assembly on time

to consider all those factors mentioned and to create alerts & action recommendations to production staff and managers, based on accurate information collected while creating part genealogy from the raw material stage to the finished product. Using this technology staff gain the eminent ability to optimize production decisions in real time and significantly improve its response time should an unexpected crisis occur. These abilities directly contribute to manufacturers' enhanced ability to meet the industry's strict quality, quality control, cost-reduction and delivery requirements, while remaining profitable and competitive.

JCM: Can you tell us more about the notion of 'Digital Thread' and 'Digital Twin'? How do they impact the production process?

A. B.-B.: Thanks to new sensor technologies the 'digital thread' weaves a single integrated stream of digital data that makes information from the entire lifecycle available and visible to all stakeholders. This includes information of asset location (tools, machines, autoclaves and personnel), assets' status and availability, exposure time information (of parts, kits and assemblies), as well as full genealogical information for each asset or resource, from the moment it was first created, throughout production and beyond into MRO (Maintenance, Repair, and Overhaul). The digital thread model is enabled by the IIoT abilities and supports full traceability of each part, starting at the raw material phase through its fabrication on the production floor, for later stage auditability and significantly shorter crisis management should a defect occur or be discovered along the way.

The 'Digital Twin' is a digital representation describing a real world physical asset. Some people make the analogy of the part's digital twin to a person's "medical record/history". The Digital Thread/ Twin concept demonstrates how greater digital context enables better decision making, while reducing risk and pushing the productivity envelope; how weaving the digital thread is crucial for reducing rework, scrap, as well as enhancing quality & quality control to ensure compliance with strict OEM's (Original Equipment Manufacturer) regulations, on-time delivery and competitiveness.

The internet of things gives a new angle to quality management



JCM: What's CTC's feedback about Plataine's solutions regarding your on-going and past programs? How is the end-user/software provider relationship organized?

PR. DR. A. H.: As an Airbus owned company, we are fortunate to have a high level of autonomy in providing ongoing specialized services to our global customers. CTC provides the 'virtual factory' environment for customers' solution inspection and evaluation. The interest generated and the follow up by Plataine creates an ideal partnership between us.

CTC is a function of multiple ongoing Research and Technology programs under one roof including evaluation of new technologies, a valuable expertise in support of serial production as well as small volume production site for Airbus or other customers. With having the knowledge of both the everyday business in an aerospace production, as well as the challenges and opportunities of the future of aircraft factory, the CTC has key competence in assessing systems like Plataine's and giving valuable feedback on improvements.

Prior to deployment, we have conducted a site survey with Plataine's Solution Engineers, IT and Professional Services teams as well as RFID hardware and integration specialists. This was essential in understanding CTC's manufacturing environment and current processes and systems we use, to ensure a smooth roll-out. The deployment phase took a couple of weeks in which both teams worked in close collabo-

ration, together with the RFID integrator, for a quick and smooth implementation. The outcome is an integrated system that provides an effective automated tracking and monitoring of Pre-preg materials and parts, as well as generation of optimal production plans.

JCM: Is the notion of big data and tomorrow's manufacturing plants intertwined? and if so why?

A. B.-B. & PR. DR. A. H.: Yes, big data is directly connected to continuous improvement in tomorrow's factories. Advanced manufacturing such as composite component fabrication requires real-time decisions based on a long and growing list of variables and constraints. As production volumes and complexity increase, manufacturers are faced with more unforeseen problems, and have less time and ability to make optimized decisions.

Theory and practice show, that the more variables considered in solving a problem, the better the potential result. However, in attempts to consider the 'big picture', human beings reach their limit at some point, and resort to solving only parts of the challenge, with or without a software designed to address that sub-problem.

Currently, integrating this vast and diverse amount of data into a global view of the process is very difficult; typically, each data set is analyzed in its own software package, limiting the ability to integrate the multiple data types and detect inefficiencies and process issues that might trigger production delays.

Integrating Intelligent, context-aware software, based on the Industrial Internet of Things (IIoT) represents dramatic opportunities as new sensor technologies collect vast amounts of data in real time, creating a rich digital context that starts with design engineers and is continuously built through the entire lifecycle of the product (AKA the 'digital thread').

Big data has an enormous impact on quality and quality control as well. The 'digital thread' is an integrated stream of digital data that makes information from the entire life cycle available and visible to all stakeholders. □

More information:

www.platine.com & www.ctc-gmbh.com

Flash to discover the Plataine's TPO solution for composites manufacturing

