Flexible and Autonomous Manufacturing Systems for Custom-Designed Products

FASTEN: an IoT platform for manufacturing. Embraer use case

8th EASN
4th September 2018

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EMBRAER
FASTEN
FASTEN EMBRAER use case
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the Grant Agreement Nº 777096.
EMBRAER PORTUGAL

Production Of Large, Critical and/or Complex Parts
Wings And Empennage Assembly
High Automation And Digitalization

FASTEN PROJECT
What is FASTEN?

Foster digital manufacturing sustainability and be an enabler of technology development between Brazil and Europe.

Provide a multi-disciplinary decision support tool to improve trade-off analysis.

Contribute to the competitiveness of Brazil and Europe.

Partners from Europe and Brasil
Two pilot demonstrations

Design of an Additive Manufacturing Supply chain in Brazil

Automatic Pick’n’Place at Embraer Portugal

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![FASTEN: RAMI 4.0 Architecture](image-url)

- RAMI 4.0: Reference Architecture Model
- Industrie 4.0

IIRA: Industrial Internet Reference Architecture
IVRA: Industrial Value Chain Reference Architecture

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FASTEN EMBRAER Use case

FASTEN – Project Structure
EMBRAER Use Case: Overall view

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Generic pick’n’place automation

Flexible and scalable robotic system

CHALLENGE:
80% of warehouse are small parts, different sizes, forms, weight, light reflexion, consistency, ...

... and new parts coming in!
Generic pick’n’place automation

Generic Solution
Adaptable
Self-Learning
Service Oriented
Architecture
Skills based approach

Exploiting cross-link with scalABLE 4.0 and ColRobot projects

Towards prescriptive maintenance

Diagnostics
Prognostics
Prescription
Support Condition Based Maintenance

CHALLENGE
Predict machine failure, prescribe solution, anticipate disruption.
Embraer: towards prescriptive maintenance

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Wing Assembly Line Simulator

Self.evolving with real data
Support Plant Management
Manage disruption
Load balancing for new or improved products
Integrate streams of data at rest and data in movement

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Results – Open Industrial IoT Platform for custom designed products – Reference architecture and system specification

Main expected results

1. Intelligent handling of custom objects
2. Full connectivity among all hardware and software components
3. Improve accuracy and provide better insights regarding the near-future
4. Solid understanding of the system’s behaviour and its sensitivity to different parameters
Next activities

4. 2019: Functional Demonstration Platform
5. 2020: Pilot Demonstrators

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www.fastenmanufacturing.eu