Model Factory @ ARTC
Architecture approach

Dr. Carlos Toro. Technical Lead, Technology Architect Smart Manufacturing Group (ARTC)
• To design and implement the collection of architectures that will support the realization of the model factory@ARTC.
• To identify and implement model factory@ARTC technology enablers by using commercial and in-house developed software.

Features of Model Factory@ARTC

Advanced Robotics
Robotic and automation technologies help boost productivity as part of the government’s efforts to shift towards higher-value manufacturing. ARTC has a number of teams dedicated to robotics. In Singapore, robots are expected to complement the workforce, not to replace.

Drone Surveillance
For everything from remote factory supervision (when attached with cameras) to serving light refreshments quickly across the factory floor.

Industrial Internet of Things
Objects such as manufacturing machines and environmental sensors are interconnected through the wireless network to provide data, which is then analyzed in a variety of ways to improve productivity. Examples include better product design and machine diagnostics to predict when machines need maintenance, thus reducing downtime.

Industrial 3D Scanning
An advanced inspection system that uses a combination of cameras and lasers to measure complex parts quickly, as well as verify the authenticity of premium parts.

Green Manufacturing
Efficient use of renewable resources such as solar panels to generate electricity, smart building designs that promote passive cooling to maintain comfortable room temperatures without air-conditioning, better waste water treatment to reduce pollution, etc.

Smart Control Room
A fully integrated control system that deals with the thousands of monitors, knobs and buttons that could lead to human error. By tapping on the Internet of Things, managers can tap into real-time data to make informed decisions and identify trends.

Smart Storage System
For fast and secure inventory management, companies could tap on technologies such as AS/RS (Automated Storage and Retrieval System). The data collected from this system can also be analyzed to manage production capacity and predict the depletion of the goods, to improve inventory management and ensure that customers receive their orders in a timely fashion.

Industrial 3D Printing
A new trend in additive design, this technology creates intricate parts more efficiently. This additive 3D printing technology—which generates 3D objects from computational data by building them up in layers from materials such as plastic or metal—allows rapid production of complex, customized and precise flexible designs. The precise addition of material also means waste for a reduced environmental footprint.

Autonomous Vehicle Technology
To reduce harmful emissions, the goods are conveyed via electric vehicles to ensure safety, efficiency and sustainability.
Implementing a manufacturing focused set of architectures

Model Factory@ARTC Architectures

- Security
- Data
- Connectivity
- Control Room
- Software
- Network
Overview - connectivity

OTT - Edge Machine
- Sensor
- Actuator
- NCU
- Other shopfloor resources

OT - IT Platform
- CPS Network
- On premise cloud
- Other Resources

IT - Cloud Enterprise
- Bespoke
- Remote cloud (xAs a Service)

This image/content is ARTC property, not for external publication
Align with other architectures
Dr. Carlos Toro. Technical Lead, Technology Architect Smart Manufacturing Group (ARTC)

Copyright © 2017 Industrial Internet Consortium. All rights reserved. This document is provided AS-IS and WITHOUT WARRANTIES.

All copying, distribution and use are subject to the limited License, Permission, Disclaimer and other terms stated in the Industrial Internet Consortium Use of Information – Terms, Conditions & Notices, as posted at [web address for full legal statement]. If you do not accept these Terms, you are not permitted to use the document.