

# Planning for Tomorrow, Today

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Paul Anderson, Technical Manager



How should manufacturing trends affect  
my automation decisions today?

# Trends in Manufacturing

Underlying Concepts

Data

# Trends in Manufacturing

## Underlying Concepts

# Data

Data collection

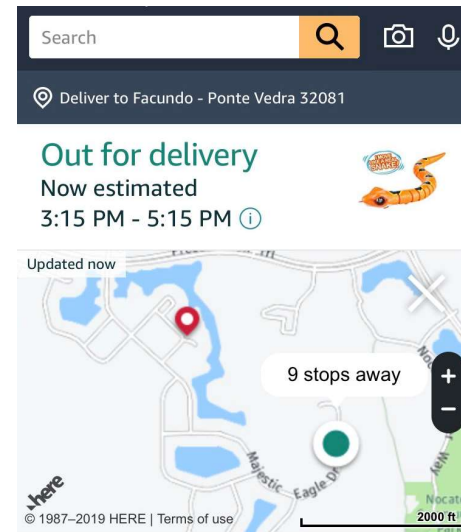
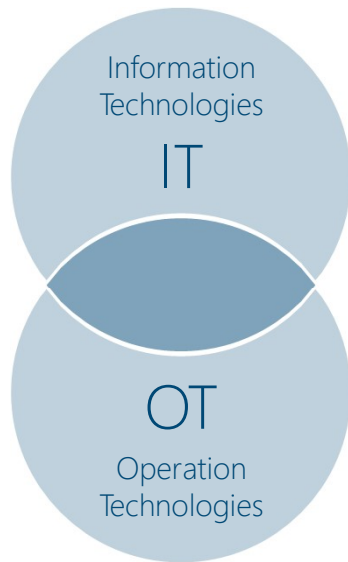
Data analysis

Data utilization

# Trends in Manufacturing

## Underlying Concepts

# Data



# Trends in Manufacturing

## Underlying Concepts

# Flexibility



Lot size of one  
Mass Customization

Flexibility over  
equipment lifespan





# Trends in Manufacturing

## Underlying Concepts

# Changing Labor Dynamics



“ To the machine, the work of the machine. To man, the thrill of further creation. ”

- Kazuma Tateishi  
Founder of Omron

## Trends in Manufacturing

### Underlying Concepts

# Changing Labor Dynamics



### Lights out Factory

Audit all human interaction with process  
Redirect from manual labor to value add creativity  
Infrastructure to support remote interaction



# Three Principles for Automation Decisions

- Focus on Machine Performance
- Develop Simple Robust Solutions
- Always Choose More Data

# Principles for Automation Decisions

## Focus on Machine Performance

# Principles for Automation Decisions

## Focus on Machine Performance

CPU Design Approach  
Network Architecture  
Program and Network Synchronized



# Principles for Automation Decisions

Focus on Machine Performance

CPU Design Approach

Network Architecture

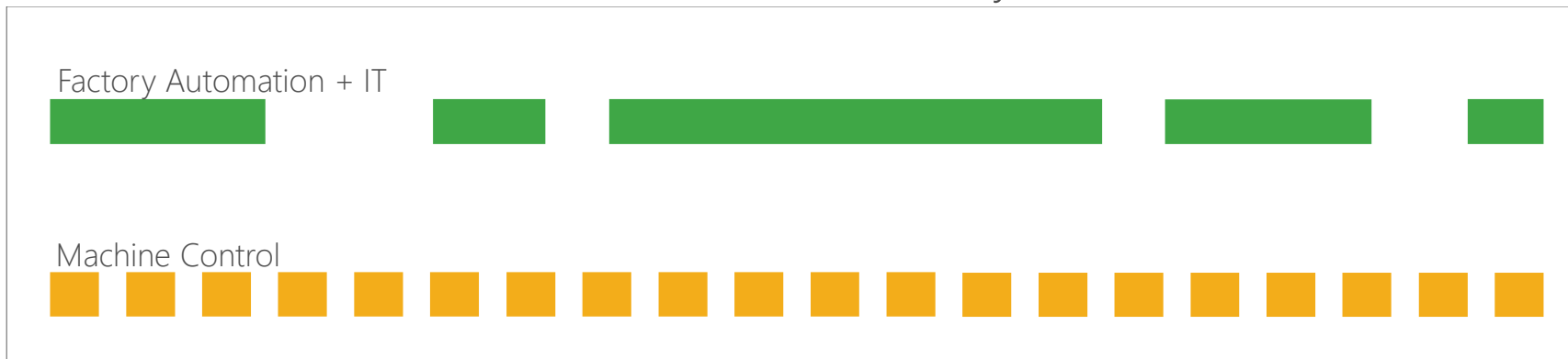
Program and Network Synchronized

EtherCAT<sup>®</sup> 

# Principles for Automation Decisions

## Focus on Machine Performance

### Network Architecture - Communication Needs by Function

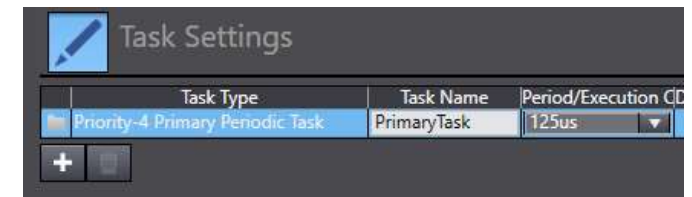
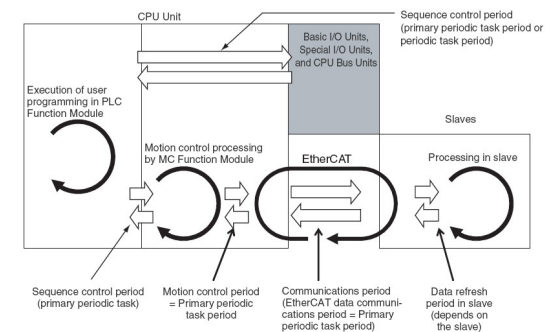


# Principles for Automation Decisions

## Focus on Machine Performance

CPU Design Approach  
Network Architecture  
Program and Network Synchronized

**Primary period = Motion control period = Process data communications period**





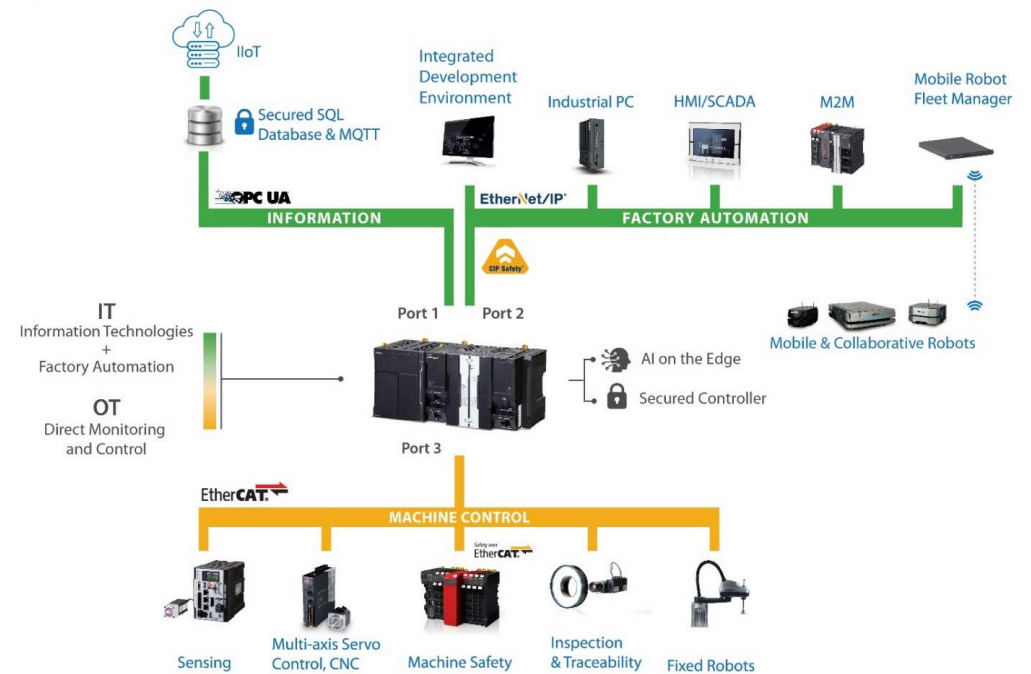
# Principles for Automation Decisions

Develop Simple Robust Solutions

# Principles for Automation Decisions

## Develop Simple Robust Solutions

IT/OT Architecture  
Out-of-the-box Features  
Backwards Compatibility



# Principles for Automation Decisions

## Develop Simple Robust Solutions

IT/OT Architecture  
Out-of-the-box Features  
Backwards Compatibility

The image displays a screenshot of the SIMATIC Manager software interface. On the left, the 'Multiview Explorer' shows a project tree with 'Configurations and Setup' expanded, and 'DB Connection' selected under 'Host Connection Setting'. The main window shows the 'Connection Settings' for 'AssemblyDB', configured for a 'SQL Server' using 'IP address' (192.168.250.100) and 'Instance name/Port No.' (1433). The 'Service name/Database name' is 'Assembly\_StageOne', with 'User name' 'PAnderson' and a masked password.

Below the settings are two data flow diagrams:

- MS\_SQL\_DB\_CreateMap:** A function block with inputs 'SQL\_Connect\_DBConnection' (DBConnection), 'varTableName' (TableName), and 'MyLamp' (MapVar). It has outputs 'DB\_Map\_Created' (Done), 'Error' (SQL\_CreateMapping\_Error), and 'ErrorID' (SQL\_CreateMapping\_ErrorID). A 'Busy' output is labeled 'Enter Variable'.
- MS\_SQL\_DB\_InsertRecord:** A function block with inputs 'SQL\_Connect\_DBConnection' (DBConnection), 'MyLamp' (MapVar), and 'Enter Variable' (TimeOut). It has outputs 'DB\_New\_data' (Done), 'Error' (MS\_SQL\_InsertRecord\_Error), 'ErrorID' (MS\_SQL\_InsertRecord\_ErrorID), and 'SendStatus' (MS\_SQL\_InsertRecord\_SendStatus). A 'Busy' output is labeled 'Enter Variable'.

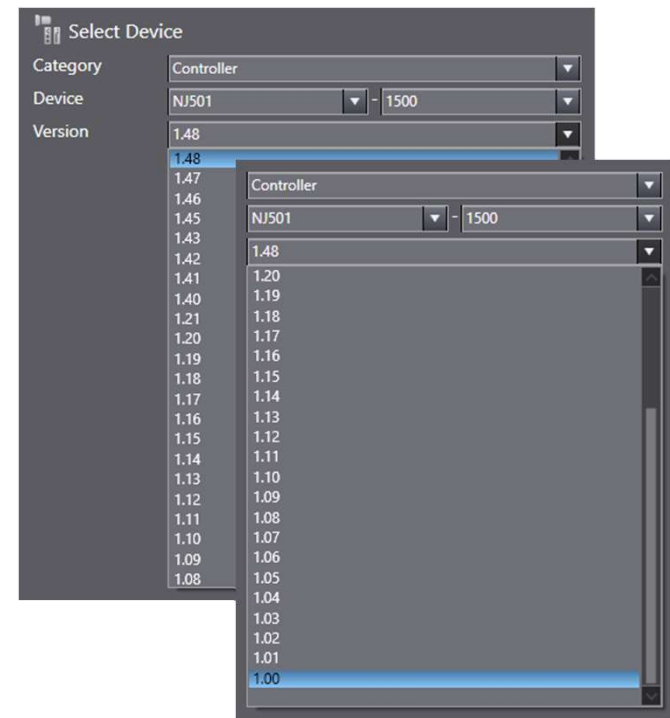
# Principles for Automation Decisions

Develop Simple Robust Solutions

IT/OT Architecture

Out-of-the-box Features

Backwards Compatibility



# Principles for Automation Decisions

Always Choose More Data

Networked Sensors  
AI + Edge Computing  
Bandwidth Mindset



# Principles for Automation Decisions

Always Choose More Data

Networked Sensors  
AI + Edge Computing  
Bandwidth Mindset



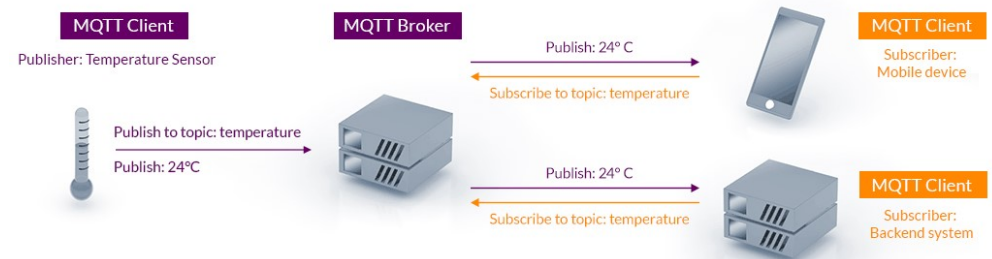
AI on the Edge



# Principles for Automation Decisions

## Always Choose More Data

Networked Sensors  
AI + Edge Computing  
Bandwidth Mindset

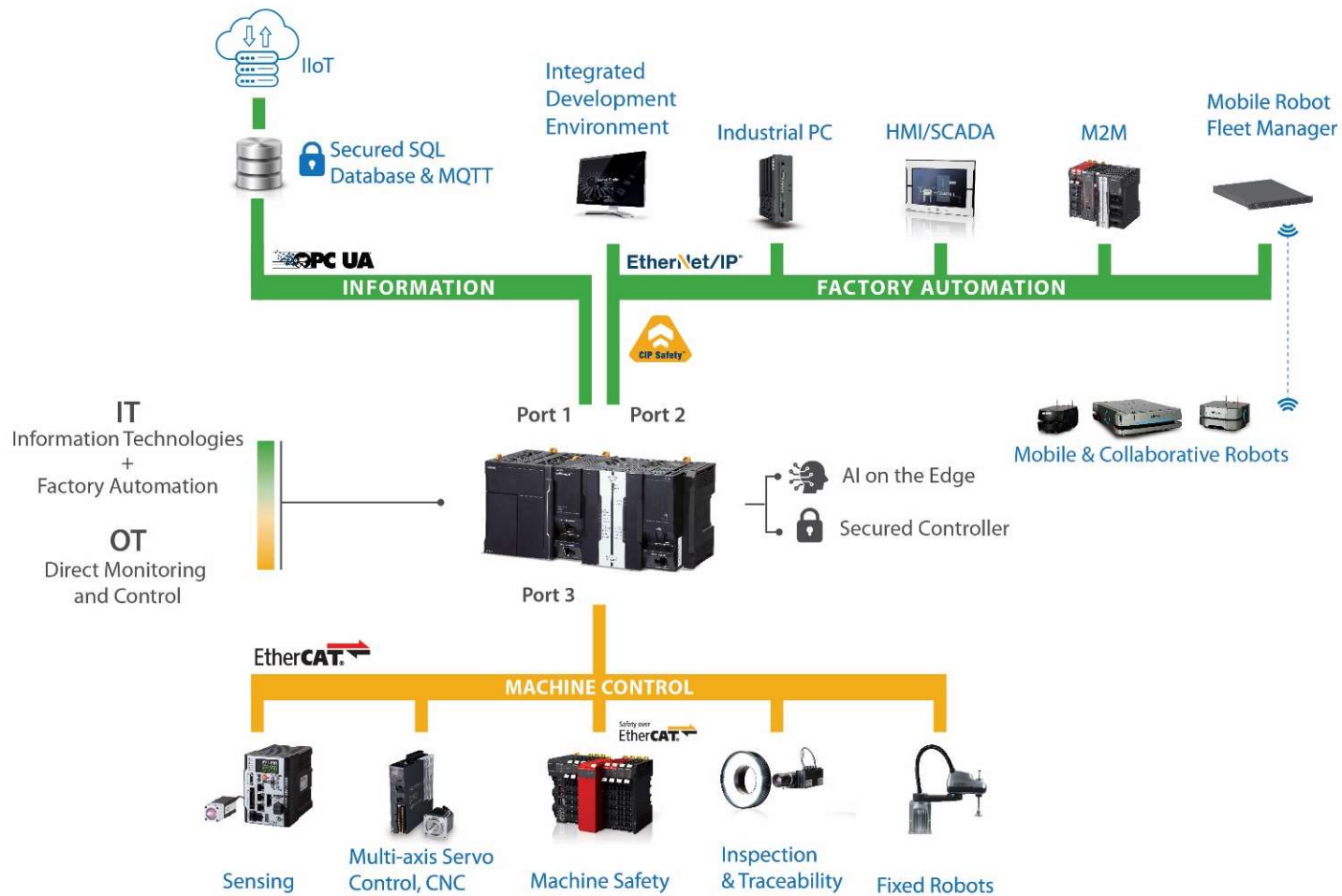


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