Production Supporting Systems in Factories

ระบบสนับสนุนการผลิตในโรงงานอุตสาหกรรม

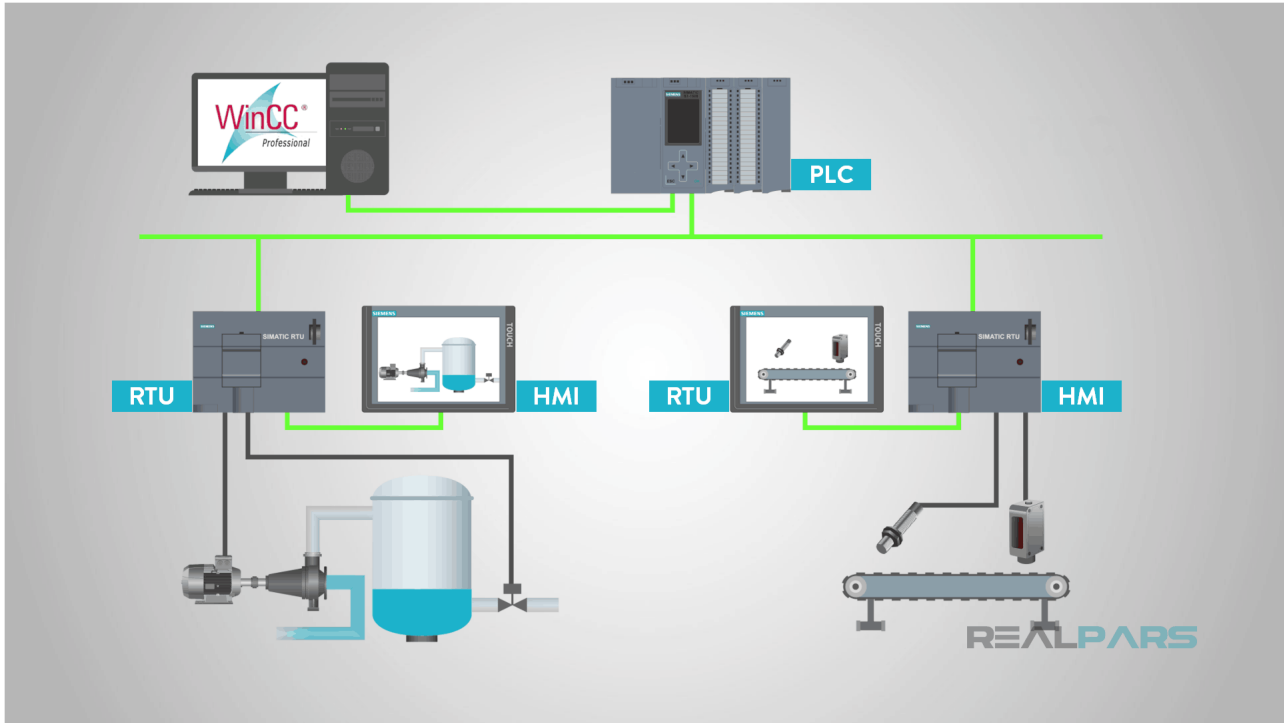
Summary

SCADA

- A system of software and hardware elements that allows industrial organizations to:
  - **Control** industrial processes locally or at remote locations
  - Directly **interact** with devices such as sensors, valves, pumps, motors, and more through human-machine interface (HMI) software
  - **Monitor**, gather, and process real-time data
  - **Record** events into a permanent storage.

Architecture

- **PLC** (Programmable Logic Controller) and/or **RTU** (Remote Terminal Units)
- **HMI** (Human Machine Interface)
- **Field devices** - sensors and actuators
- **SCADA computer**



Protocol

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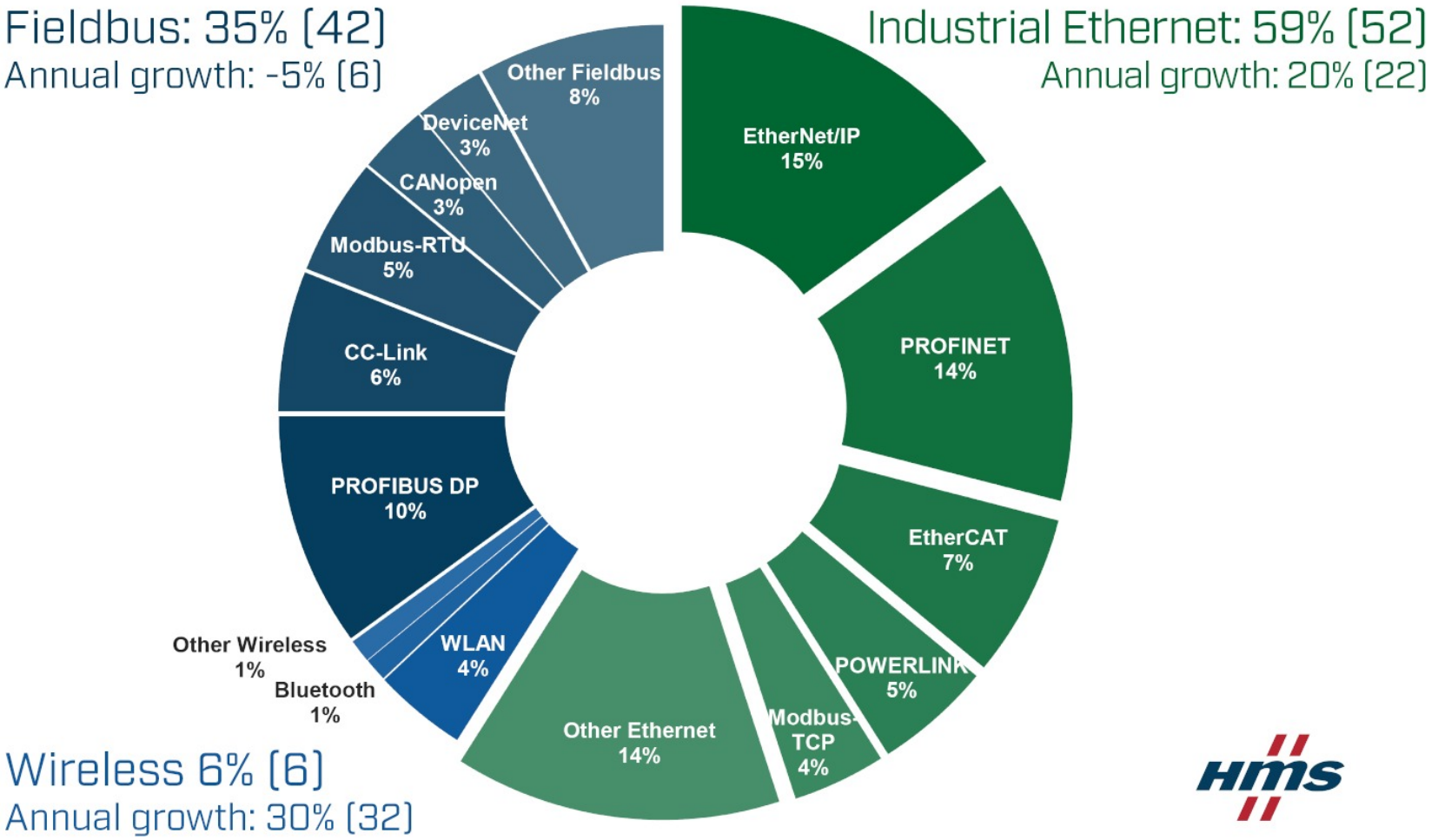


Comparison to SCADA components

Component	Function	SCADA Equiv.
`Node-Red`	Collect data	PLC / RTU
	Display data	SCADA computer
	Notify to `Line`	SCADA computer
	Write to `Database`	SCADA computer

Comparison to SCADA components

Component	Function	SCADA Equiv.
`Mobile phone`	Output Sensor	Field devices
	Touch screen	HMI

Protocol used in the project

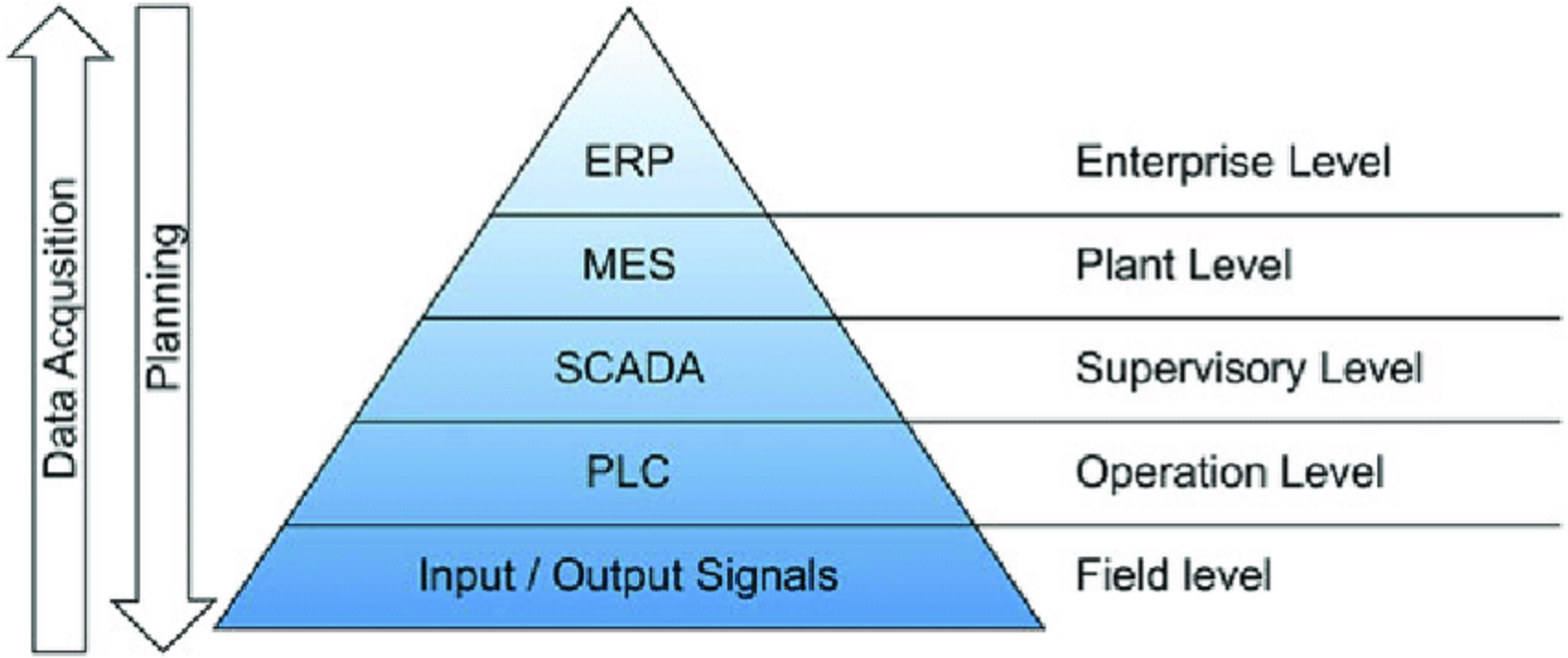
- HTTP
- MQTT

IIot

- The Industrial Internet of Things (IIoT)
- Internet of Things (IoT) in industrial environments.
  - It includes the collection of data from smart connected equipment, sensors, actuators, and systems.

Why

Hierarchical model of an industrial automation



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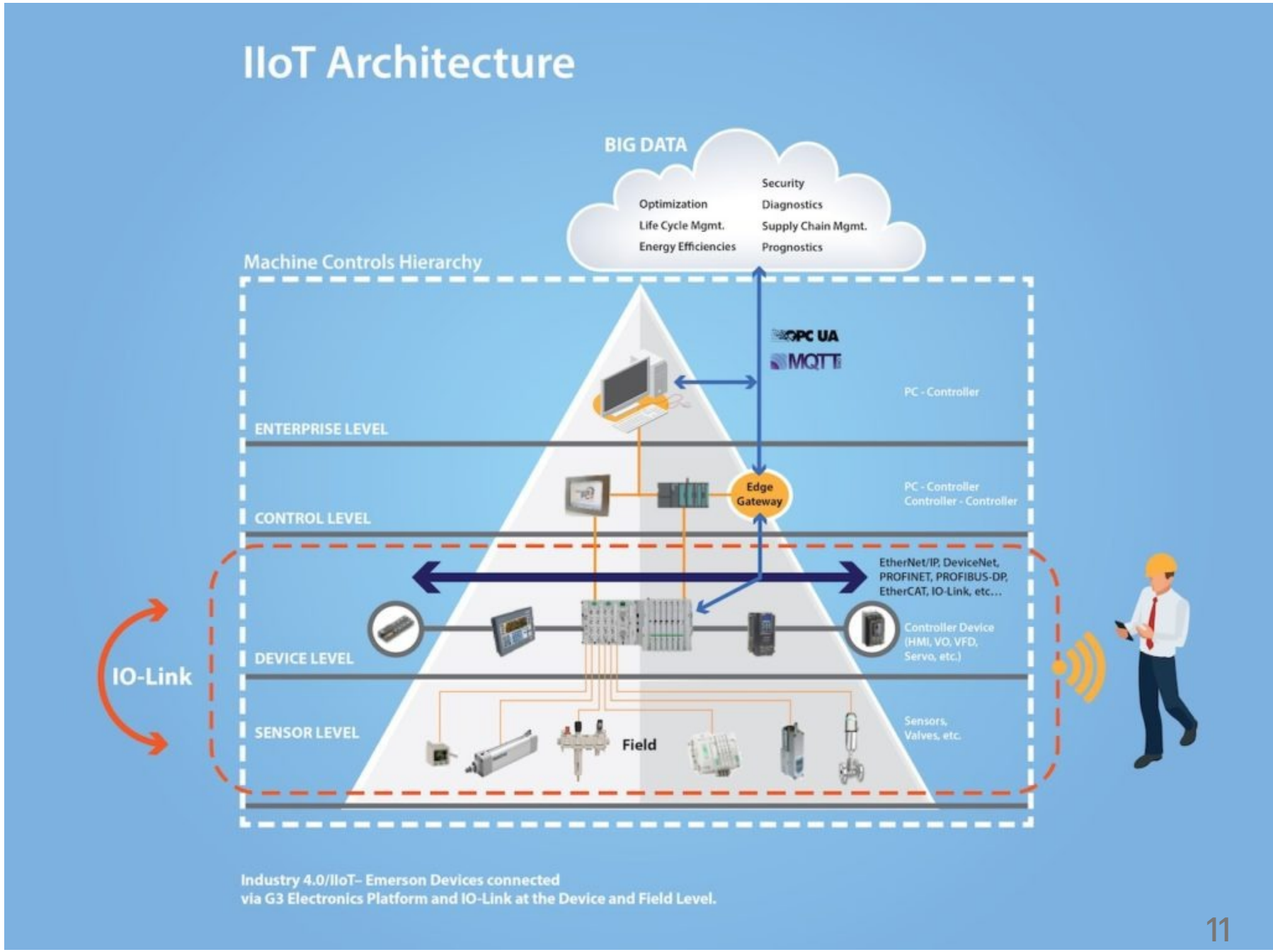
IIoT Architecture
BIG DATA
Optimization
Life Cycle Mgmt.
Energy Efficiencies
Security
Diagnostics
Supply Chain Mgmt.
Prognostics
Machine Controls Hierarchy
OPC UA
MQTT
PC - Controller
ENTERPRISE LEVEL
Edge Gateway
PC - Controller
Controller - Controller
CONTROL LEVEL
EtherNet/IP, DeviceNet,
PROFINET, PROFIBUS-DP,
EtherCAT, IO-Link, etc...
IO-Link
Controller Device
(HMI, VO, VFD,
Servo, etc.)
DEVICE LEVEL
SENSOR LEVEL
Field
Sensors,
Valves, etc.
Industry 4.0/IIoT– Emerson Devices connected
via G3 Electronics Platform and IO-Link at the Device and Field Level.

Benefits

- เพิ่มประสิทธิภาพการสื่อสารการวางแผนการทำงานในโรงงานอุตสาหกรรม
  - ยืดหยุ่น
  - ประหยัดเวลา
- หลีกเลี่ยงการ Downtime
  - การบำรุงรักษาที่คาดการณ์ล่วงหน้า (Predictive maintenance)
  - การตรวจสถานะของเครื่องจักร (Monitor)