VANDERLANDE

How wireless technology affects product structure and organization.

Evert van de Plassche

Introduction of speaker

TU Delft mechanical engineering (graduated 2001)

Product concepting and development at Vanderlande

- Item picking robot
- Case picking system

Machine diagnostics at ASML

Current role is technology architect IoT (internet of things)

- AGV for baggage handling
- Condition monitoring applications

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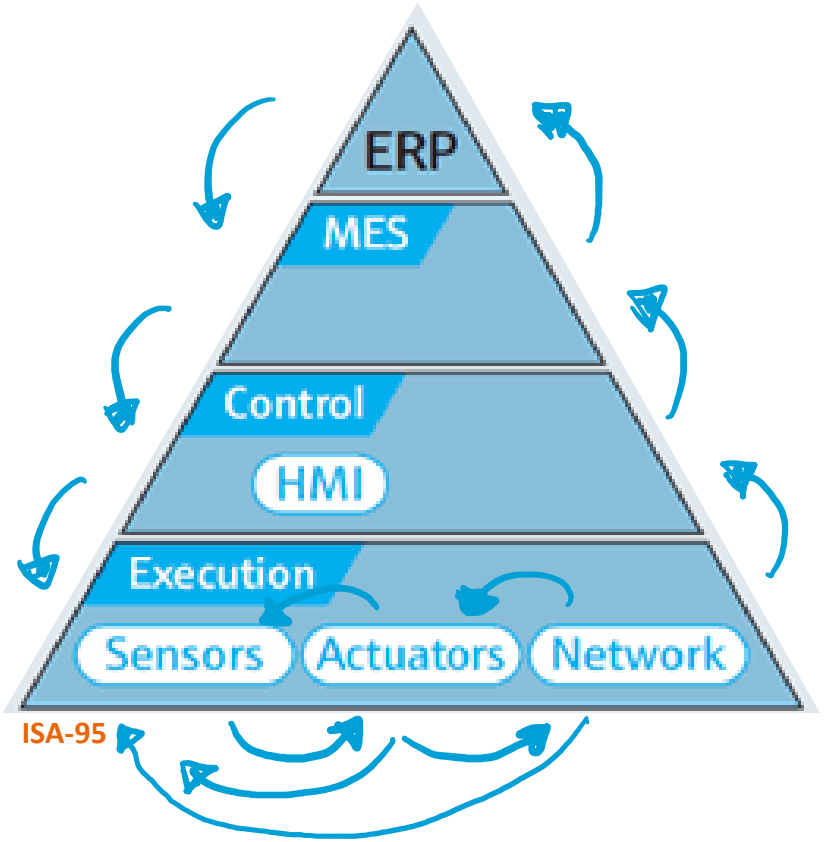
Communication



A → B
DESTINATIONS

CONDITION & STATUS

SCADA

SAFETY

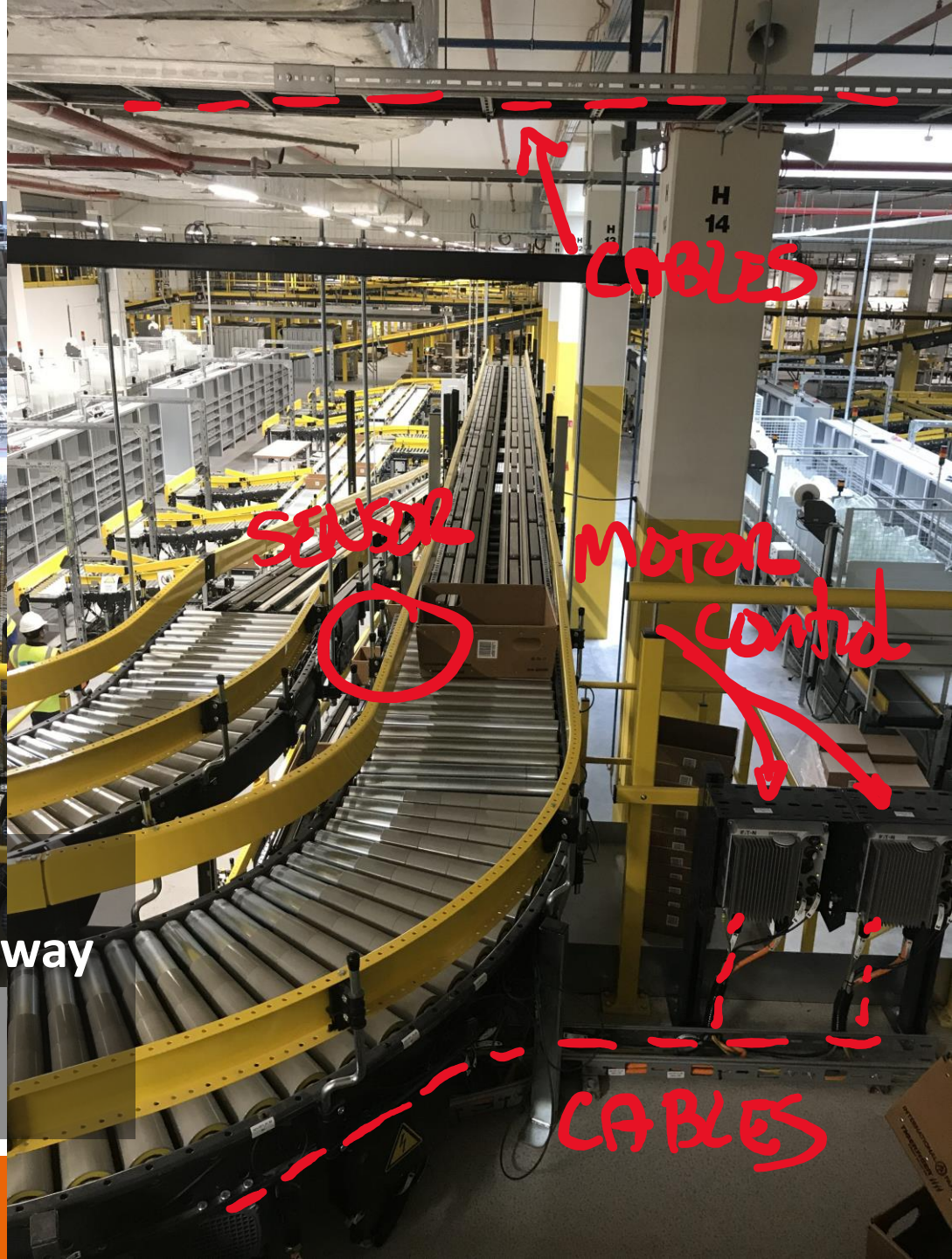
SENSE – ACTUATE

control loop

The simple answer

Wired, unless…

Stationary Equipment



Wired

- Powered equipment needs wires anyway
- Large area + “dense”
- High reliability -> redundancy

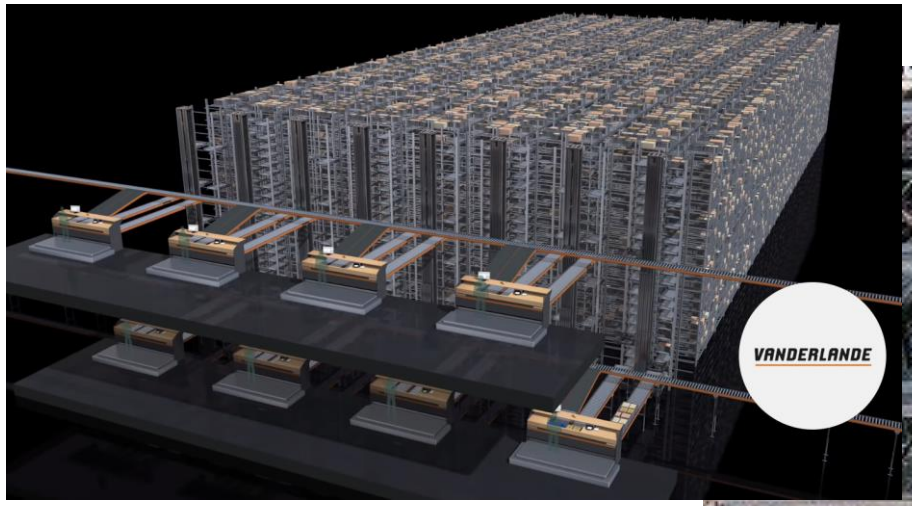
FLEET – Automated vehicles for baggage handling

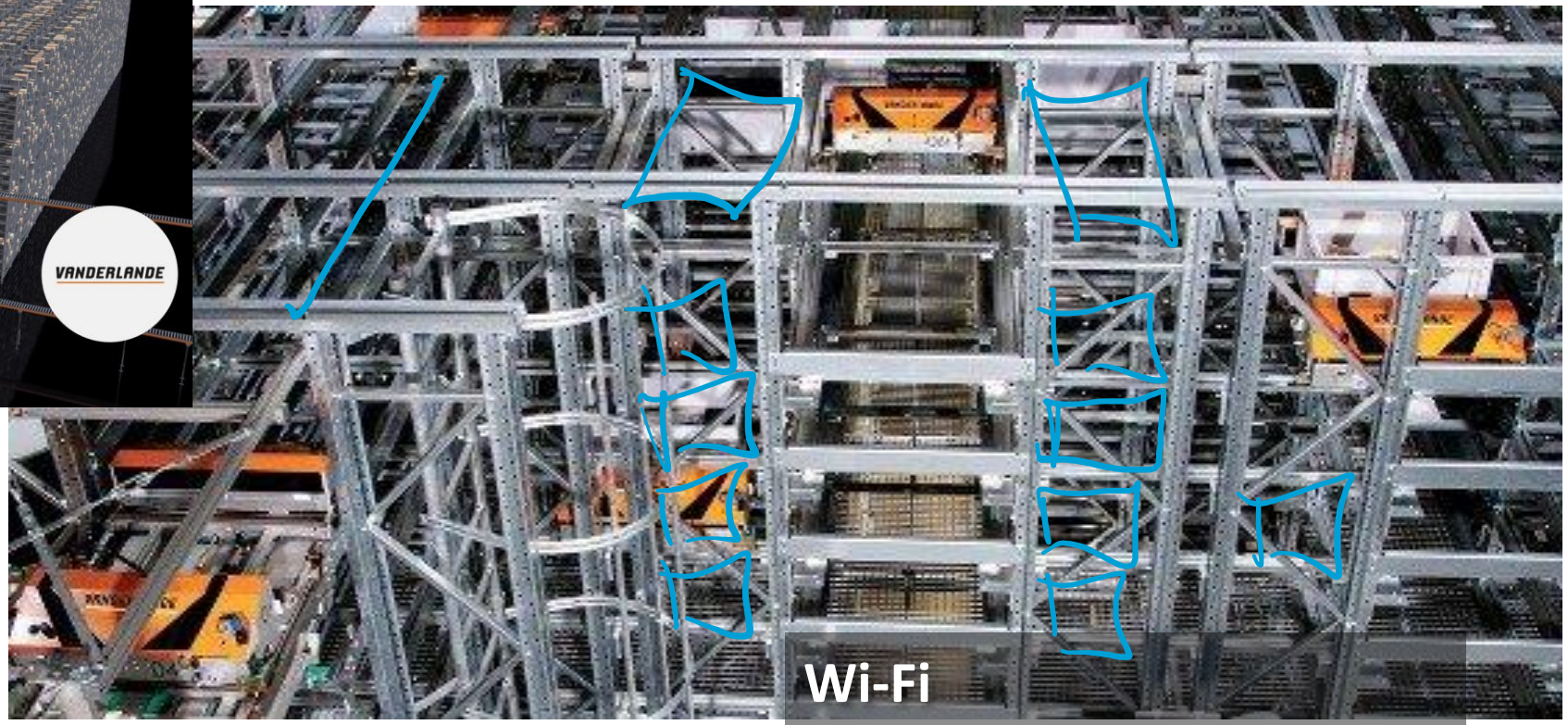
Mobile systems

Wi-Fi

- Managed by customer IT
- Passenger terminal → many devices + security
- Fast roaming
- Towards outdoor applications → 4G/5G

ADAPTO – shuttle-based storage and retrieval system

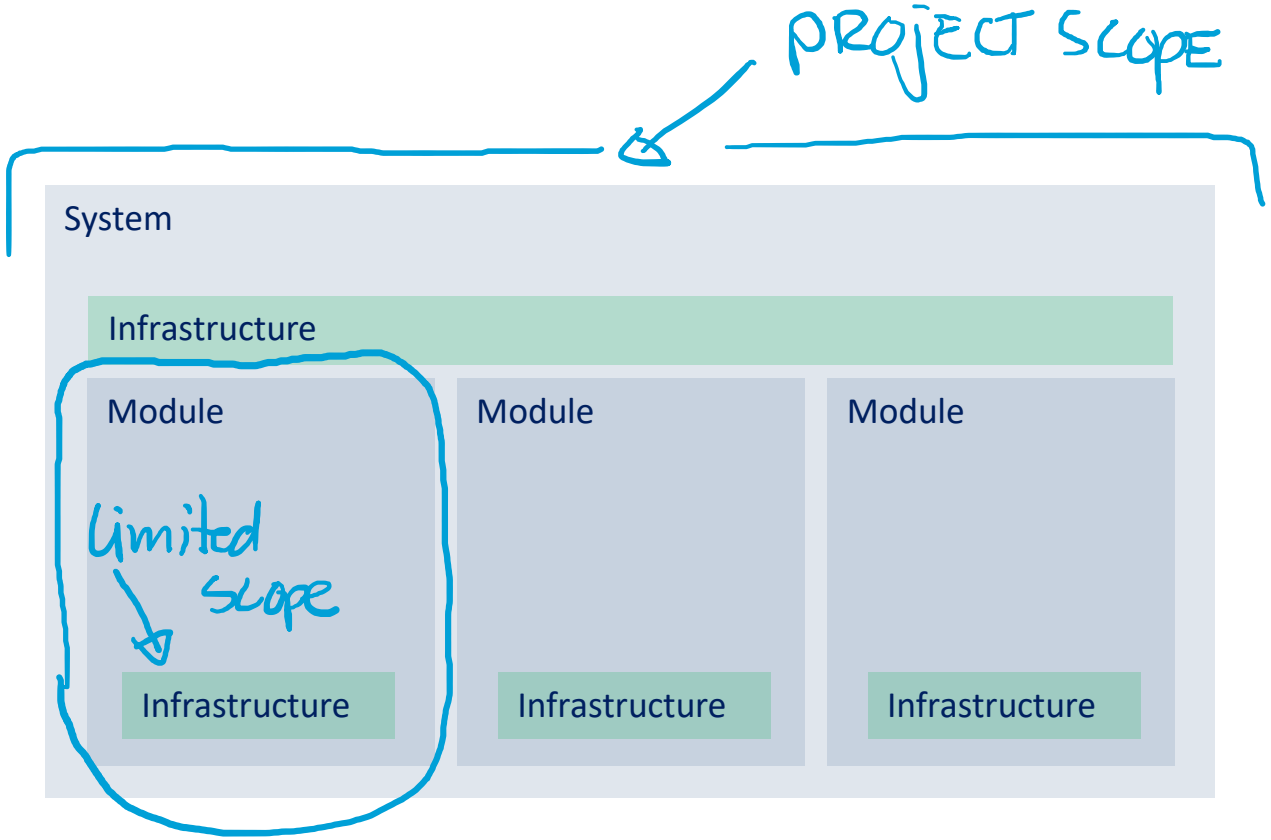




Wi-Fi

- Varying materials
- Exception handling

Product Structure and Organization



Mainly OT-domain depicted

Challenges when considering wireless

Power supply

- Batteries, only when acceptable lifetime + remaining life (predictable service) or automatic charging mechanism

Bandwidth

- Configuration + software OTA upgradeable
- Reliable, predictable latency

Coverage

- How to know if the connection is good?
- Interferences

Safety

- Continuous connection required

Security

- Authorization / authentication and encryption
- Managing who can connect

Location / Asset management

- Where is the device?

Network management

- Who manages the network? Guarantees?

Cost

- Competitive market → multiple networks = multiple effort
- Training and skillset to cover product lifecycle

Conclusion - How I see the future

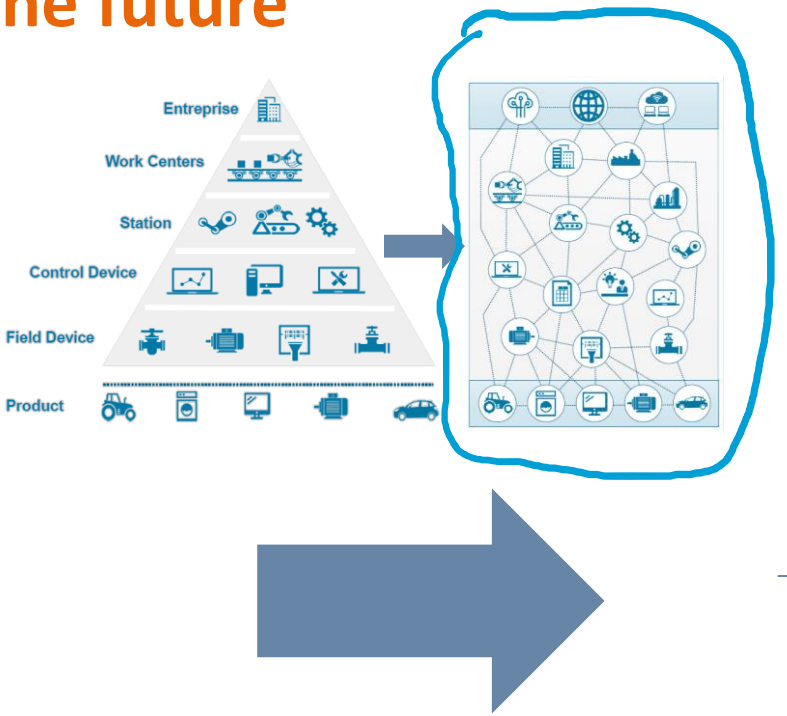
Data driven services

Built-to-evolve systems

(as opposed to built-to-last systems)

Configure-to-order

Plug-and-play installation and commissioning



"Everything Ethernet"

Communication-as-a service

(wired + wireless)

"Ethernet over power"

(industrial setting, as opposed to PoE)

Power-independent wireless sensors (device insight)

(energy harvesting, OTA update, significant sampling rate)

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