

Internet of Things (IoT) di Industri Manufaktur

Disampaikan pada 19 Oktober 2016 di Universitas Pancasakti, Tegal



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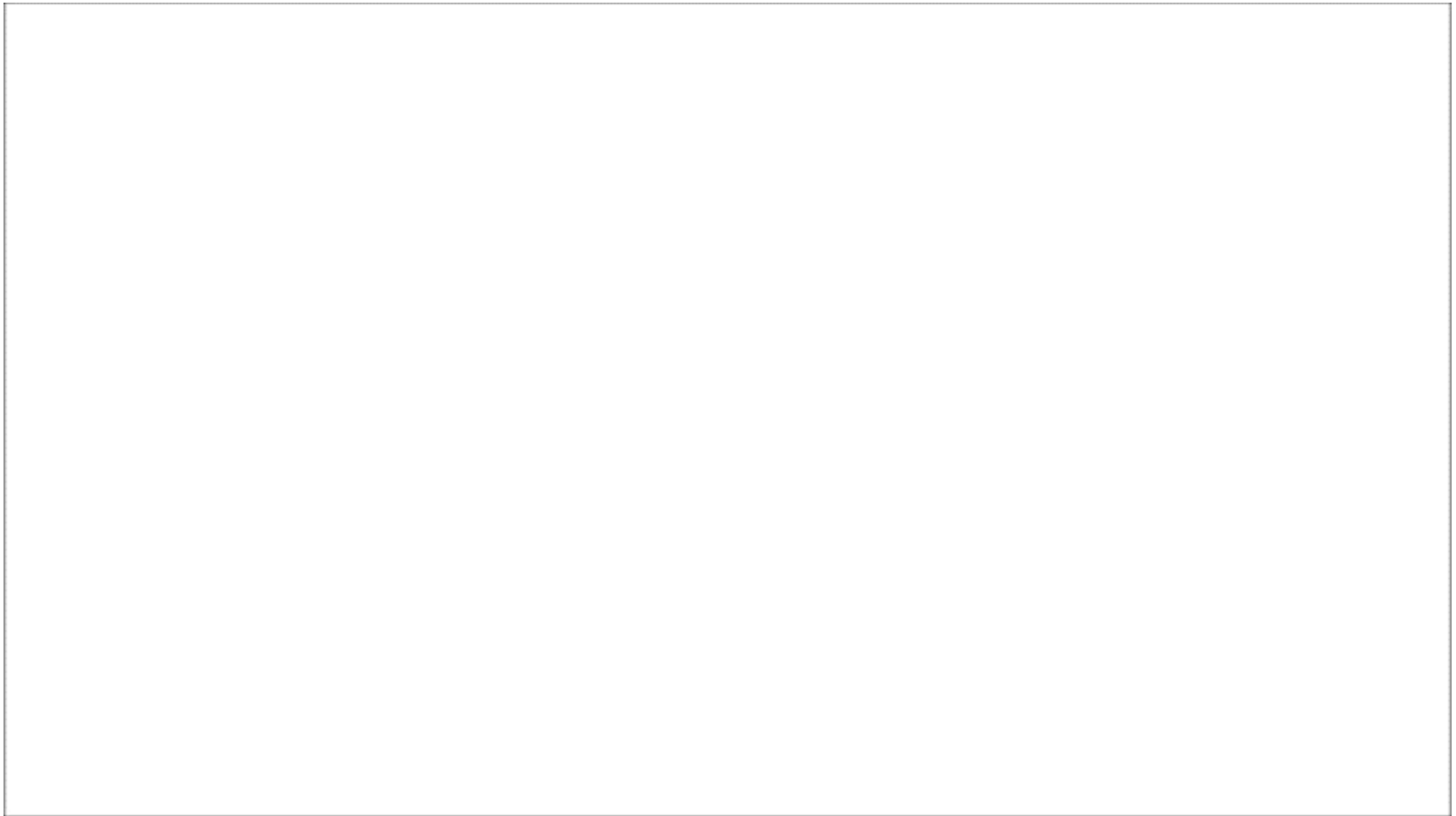
Pendidikan

- S1: Teknik Elektro, Universitas Gadjah Mada, 1997
- S2: Telematics, University of Twente, Netherlands, 2005
- S3: Computer Science, University of Twente, Netherlands, 2010

Pengalaman kerja

- 2006 – 2010: Research asistant, University of Twente
- 2010 – 2014: Kepala Badan Sistem Informasi, UII
- 2014 – : Direktur Pascasarjana Fakultas Teknologi Industri UII

Industry 4.0 (<https://youtu.be/dkddSa00Zcs>)



Industrial revolution

- | | |
|----------------------------|-------|
| 1. Mechanical power | 1800s |
| 2. Mass production | 1900s |
| 3. Computer and automation | 1960s |
| 4. Cyber-physical systems | 2010s |

Smart factory

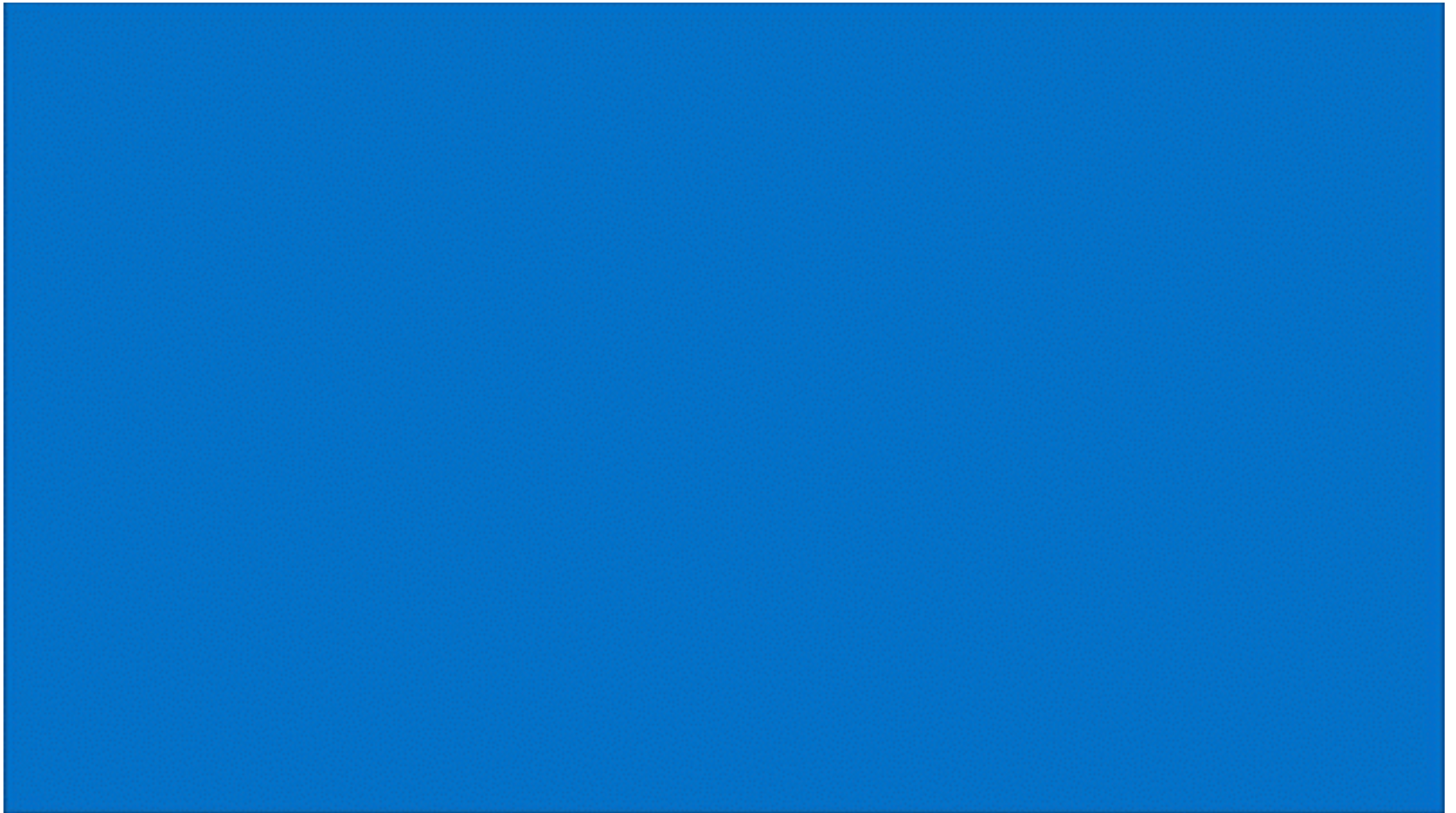
Cyber-physical systems monitor the physical processes of the factory and make decentralized decisions.

Principles

- Interoperability
- Information transparency
- Decentralized decision-making
- Technical assistance

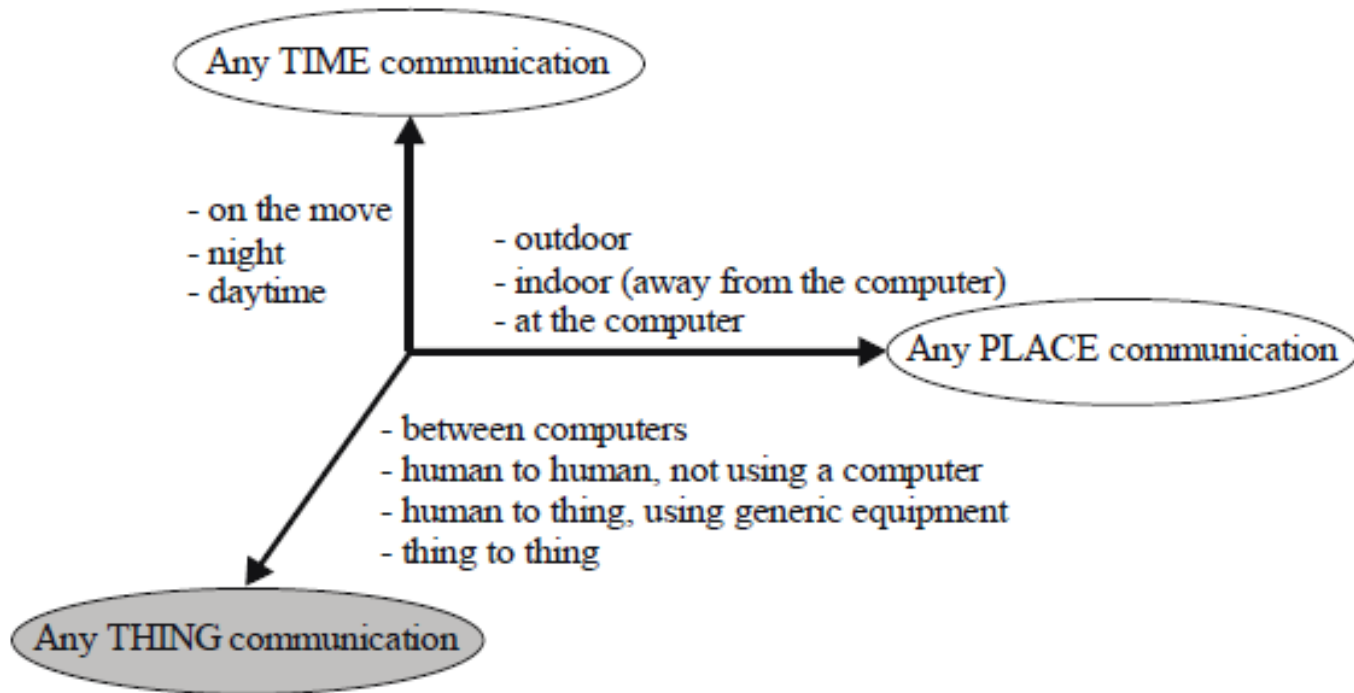
The physical systems become Internet of Things (IoT)

Internet of Things (IoT) (<https://youtu.be/Q3ur8wzzhBU>)



- **The internetworking of physical devices (“things”)** – embedded with electronics, software, sensors, actuators and network connectivity that enable those devices to collect and exchange data.
- **Global infrastructure for the information society**, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies.

ITU-T, Recommendation Y.2060, 2012



Any time. Any place. Any thing.

IoT in manufacturing

Industrial Internet of Things (IIoT) is the use of Internet of Things (IoT) technologies in manufacturing.

At its root, the IIoT is a vast number of connected industrial systems that communicate and coordinate their data analytics and actions **to improve performance and efficiency and to reduce or eliminate downtime.**



Example: General Electric

At one of GE's Durathon battery plants, 10,000+ sensors measure temperature, humidity, air pressure and machine operating data in real time.

This not only gives the opportunity to monitor production and adjust processes in real time, but also to trace battery performance back to specific batches of powder and at every step along the process.

Smart manufacturing is about creating an environment where all available information—from within the plant floor and from along the supply chain—is captured in real-time, made visible and turned into actionable insights.



Smart manufacturing requires technology to make sure machines work together, material flows visibly in real-time, and teams of knowledge workers orchestrate the entire process. **The Internet of Things is the technology environment that makes this possible.**

- In plant floor applications, the Internet of Things can create a network linking a range of manufacturing assets from production equipment to parts being produced, from sensor-embedded automation controls to energy meters, from trucks to a warehouse's smart shelves.

- With the Internet of Things, manufacturers can give each of their physical assets a digital identity that enables them to know the exact location and condition of those assets in real time ubiquitously throughout the supply chain.

Benefits

- Vastly improved operational efficiency (e.g., improved uptime, asset utilization) through predictive maintenance and remote management
- The emergence of an outcome economy, fueled by software-driven services; innovations in hardware; and the increased visibility into products, processes, customers and partners

- New connected ecosystems, coalescing around software platforms that blur traditional industry boundaries
- Collaboration between humans and machines, which will result in unprecedented levels of productivity and more engaging work experiences

Terima kasih.

<http://master-fit.uii.ac.id>