

AI + MANUFACTURING

The Power to Make Anything Anywhere Quickly



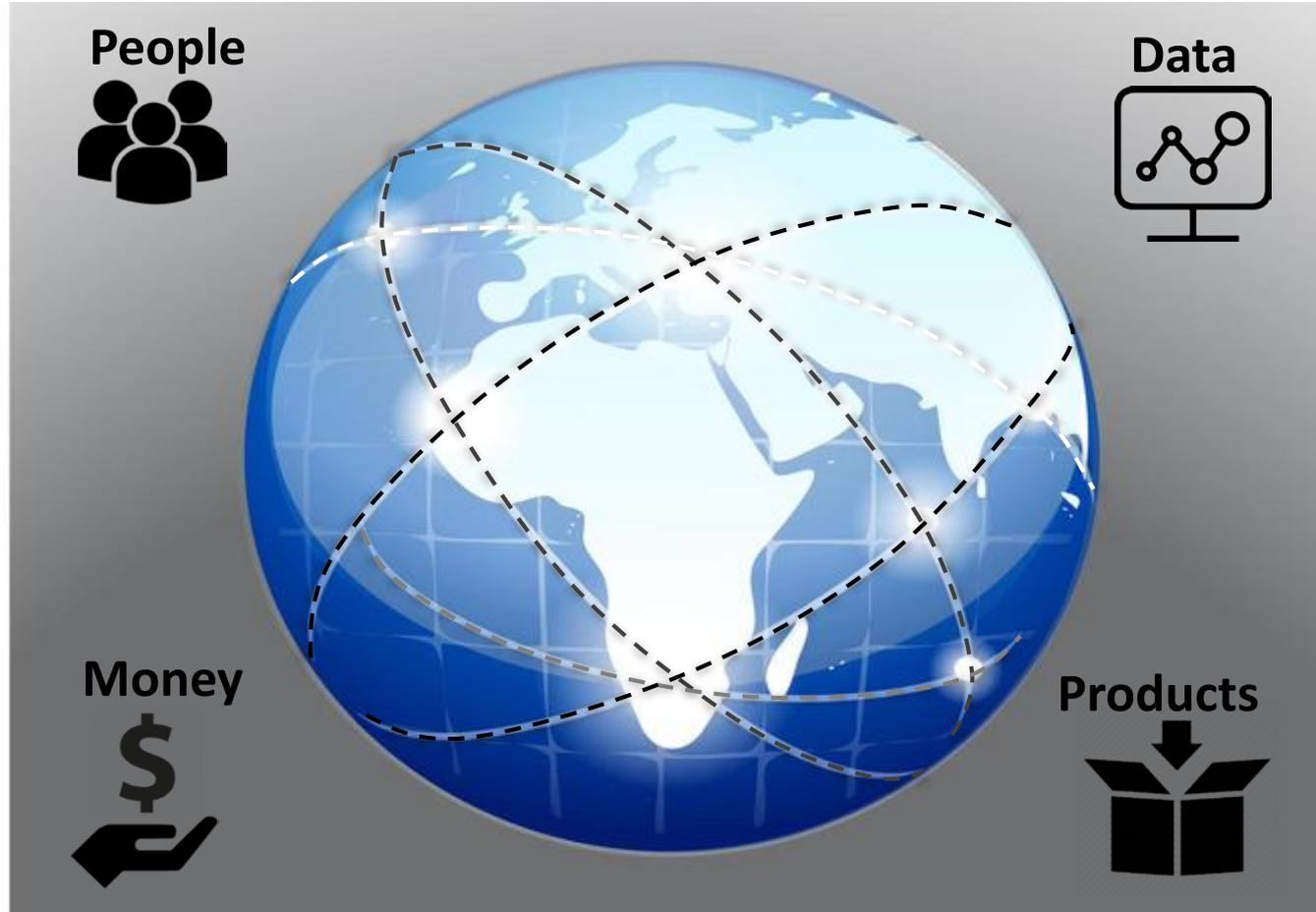
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July 11, 2019 Presentation to Congressional Manufacturing Caucus

World - Yesterday World Today and Evolving



Smart Manufacturing

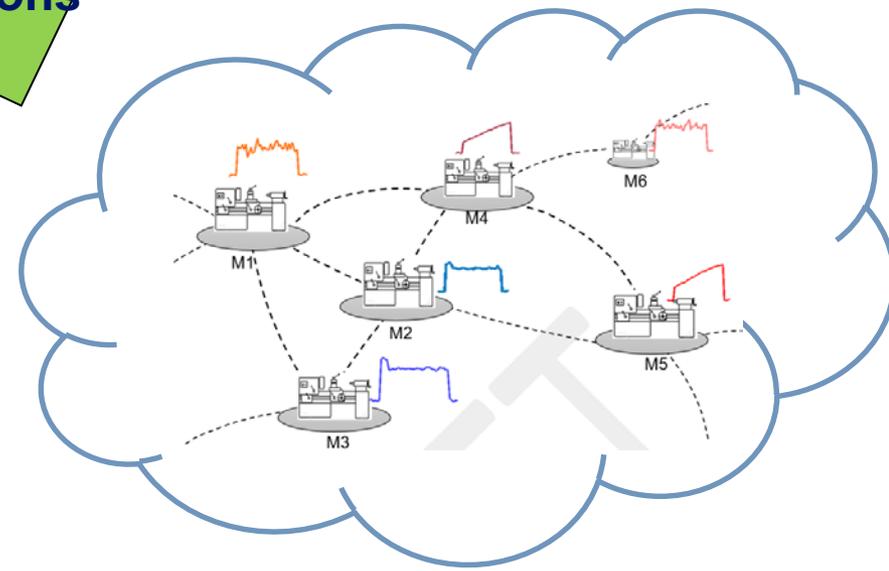
Physical World



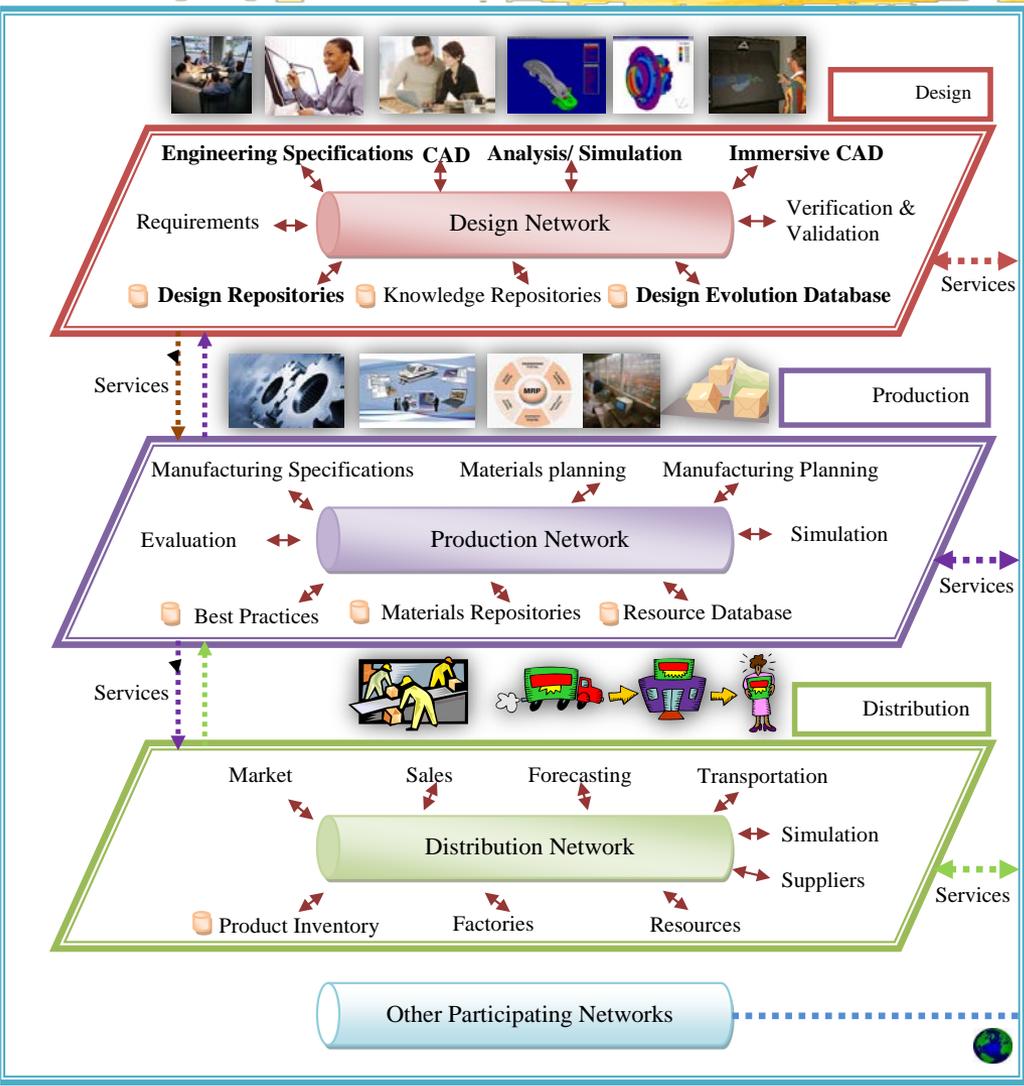
**Insights
Actions**

**Unprecedented
access to data**

Cyber World



Manufacturing = Networked Enterprise



➤ **Collection of business processes**

➤ **Consists of many networks including**

- Design
- Production
- Distribution

(Source: Dr. Sriram, NIST)

Enabling Technologies

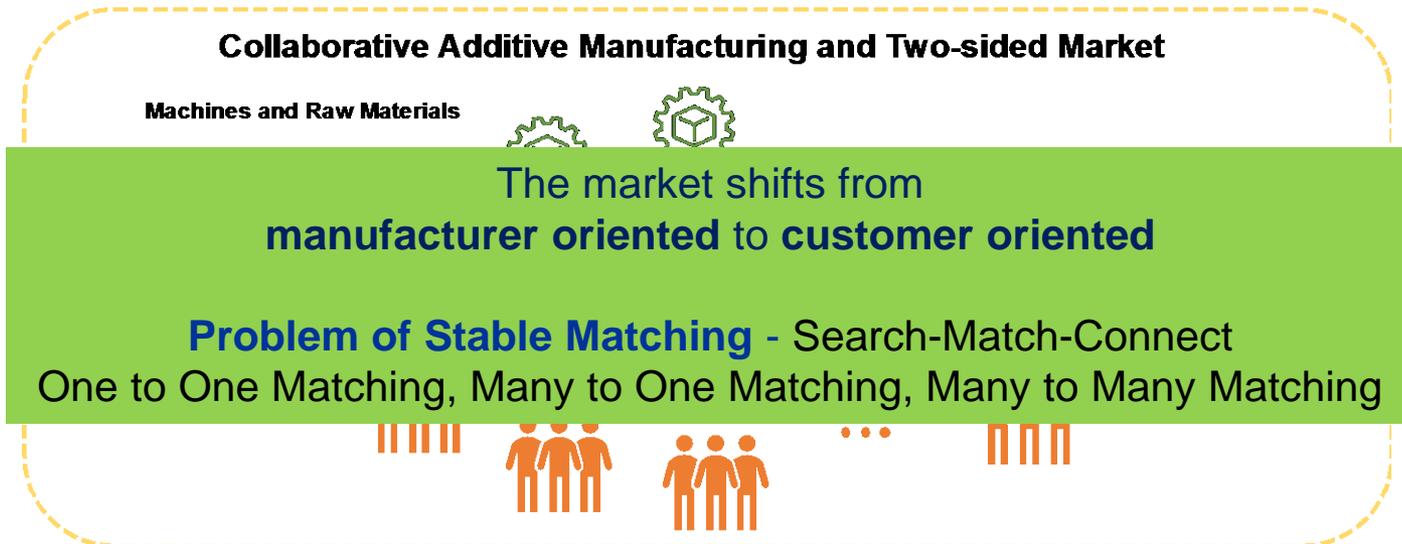
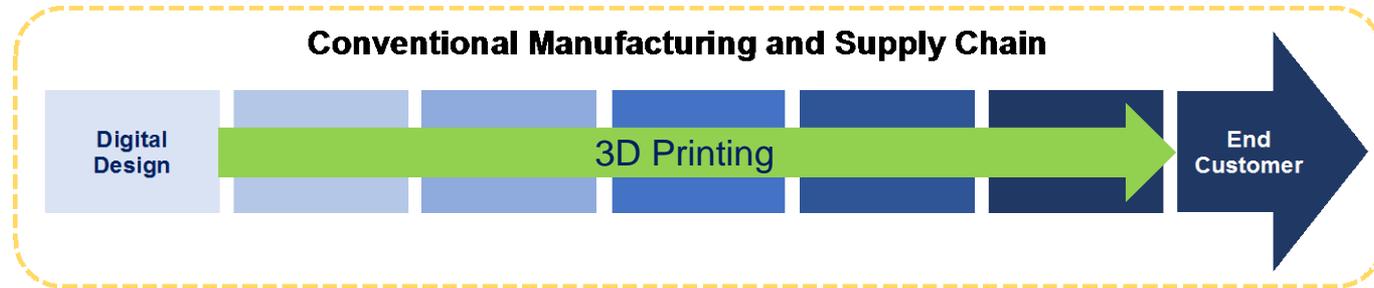
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- **Machine Learning/Neural Networks/Deep learning**
 - **Computer Vision**
 - **Natural Language Processing**
 - **Speech Recognition**
 - **Robotics**
 - **Sensors/IoT**
 - **Network Science**
 - **Operating Systems**
 - **Optimization**

Main Challenge Real-Time Prediction

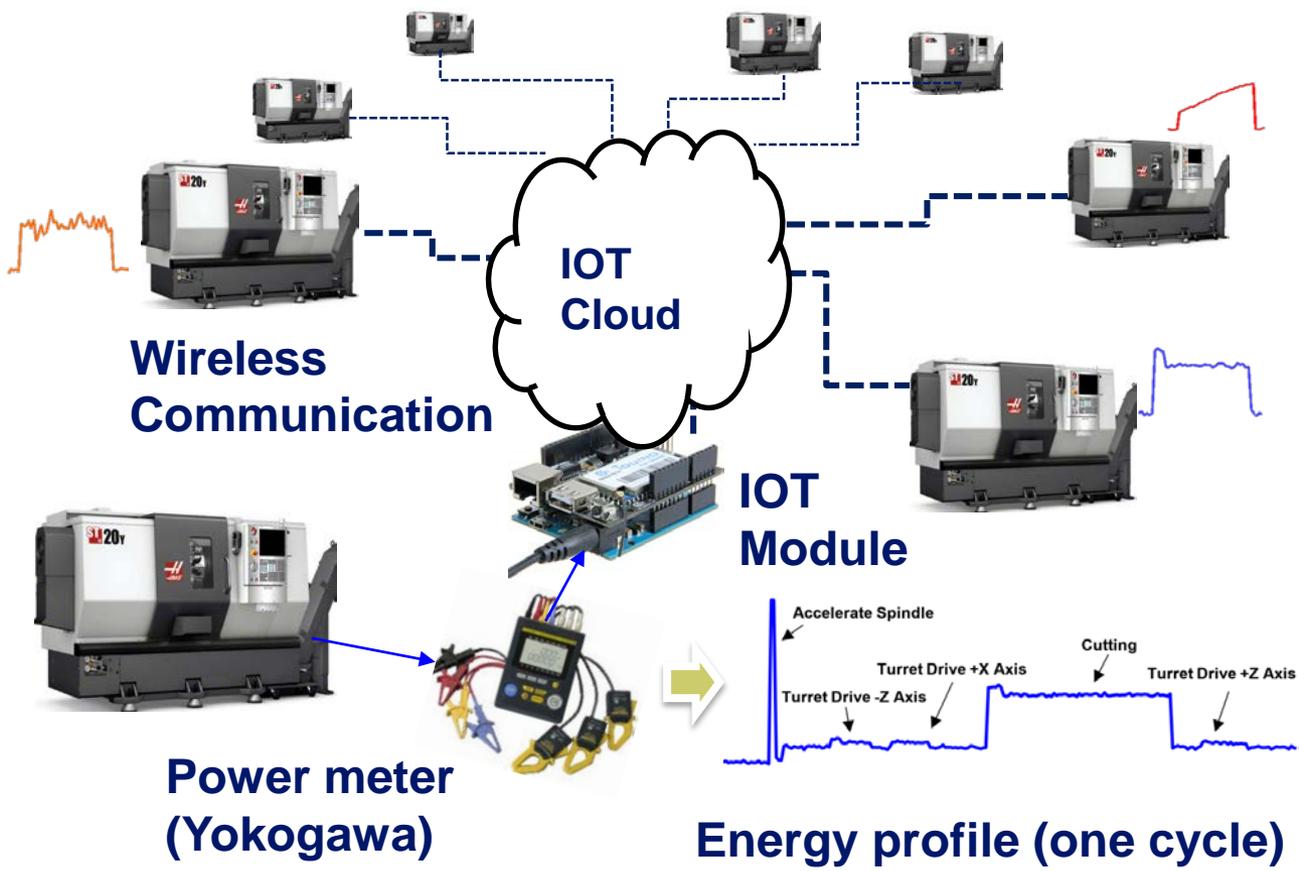


Source: Ashok N. Srivastava, <http://www.jklossner.com>

Real-Time Decision Making Manufacturing Supply Chains

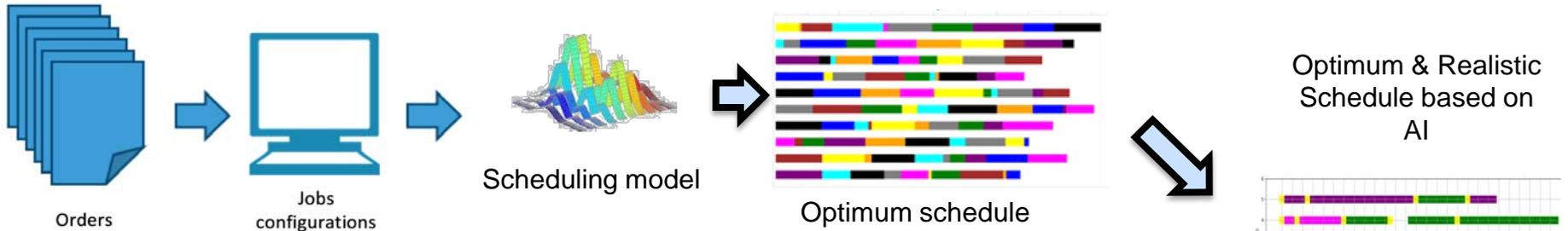


Real-Time Decision Making Enterprise Monitoring

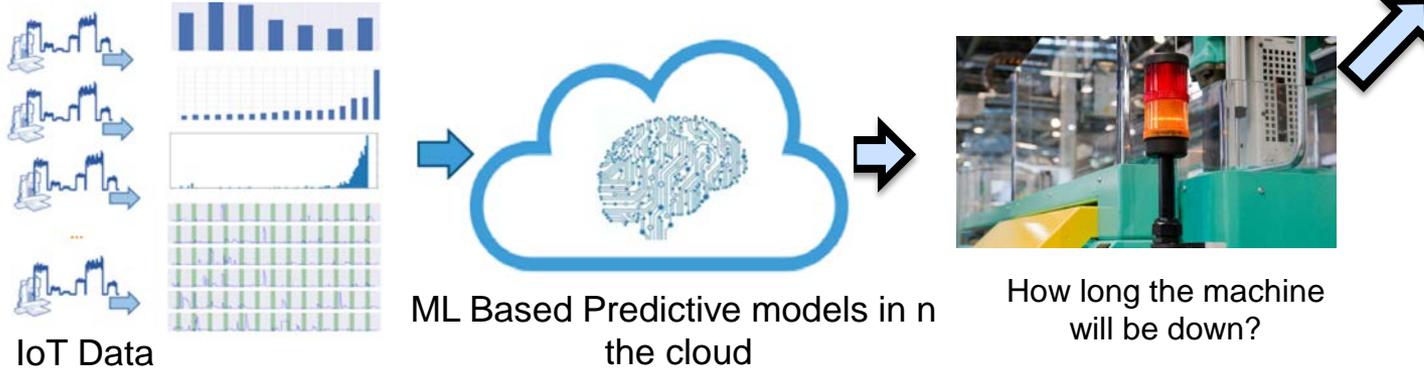


Real-Time Decision Making Scheduling

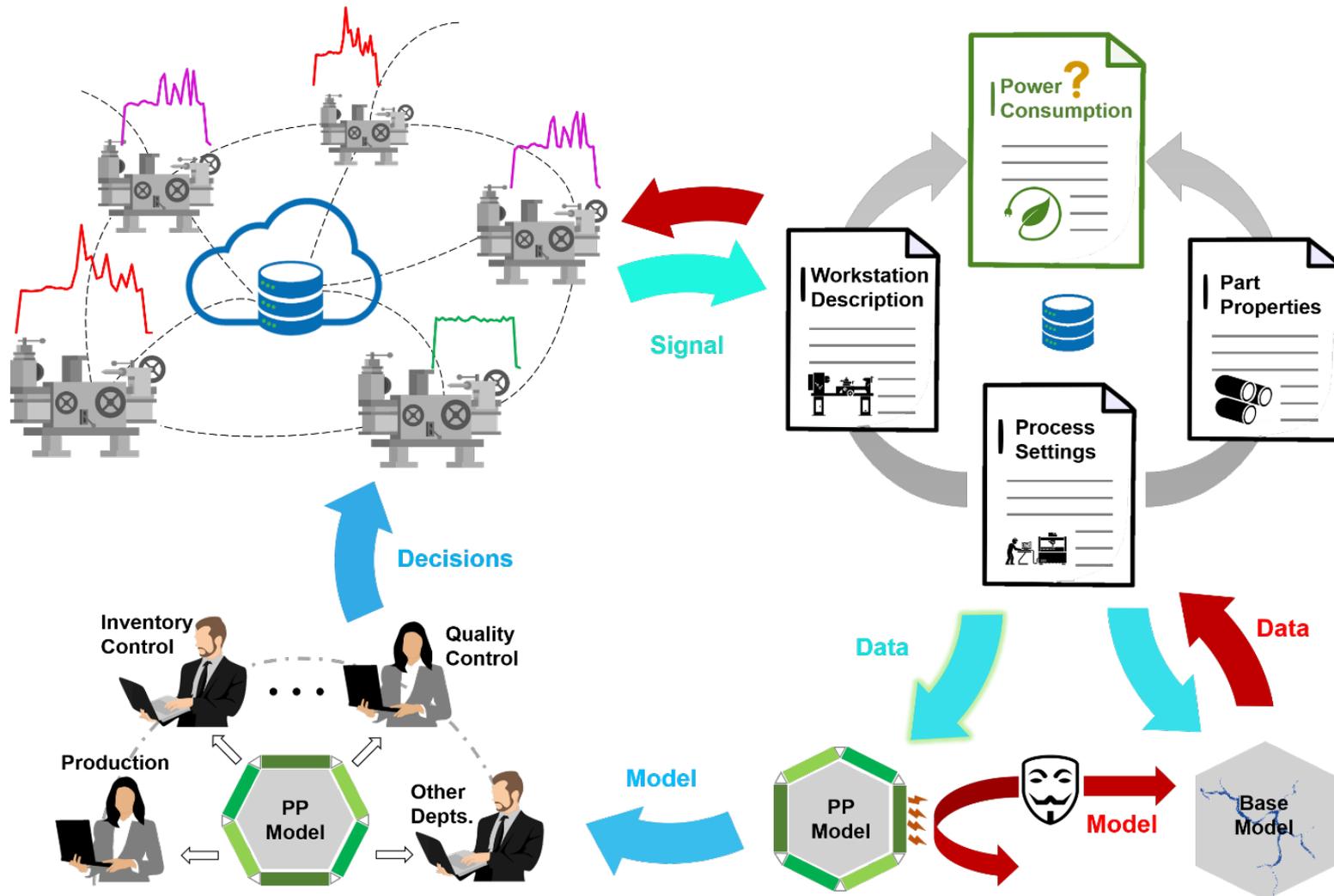
Now



Future



Real-Time Decision Making Privacy-preserving Modeling



The Future

AI Enabled P7- Manufacturing Systems



Manufacturing of the Future

➤ **AI will facilitate**

Finding patterns faster from networked enterprises

Learning strategic, tactical and operational rules, and associated models

Enabling devices (including robots) and humans to co-exist and co-learn

➤ **Manufacturing 2030**

Future transformed manufacturing networks will have real-time accessibility and decision-making capability

This will enable quality manufacturing of what the customer needs, when they need it and where they need it.

P7-Manufacturing Networks