e-Manufacturing Requirements

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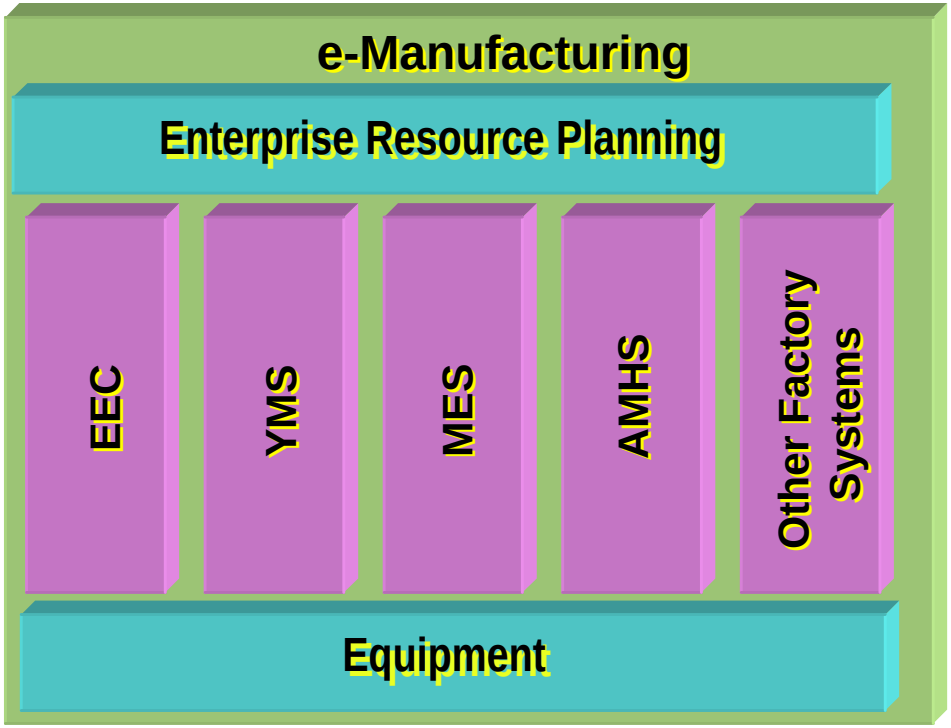
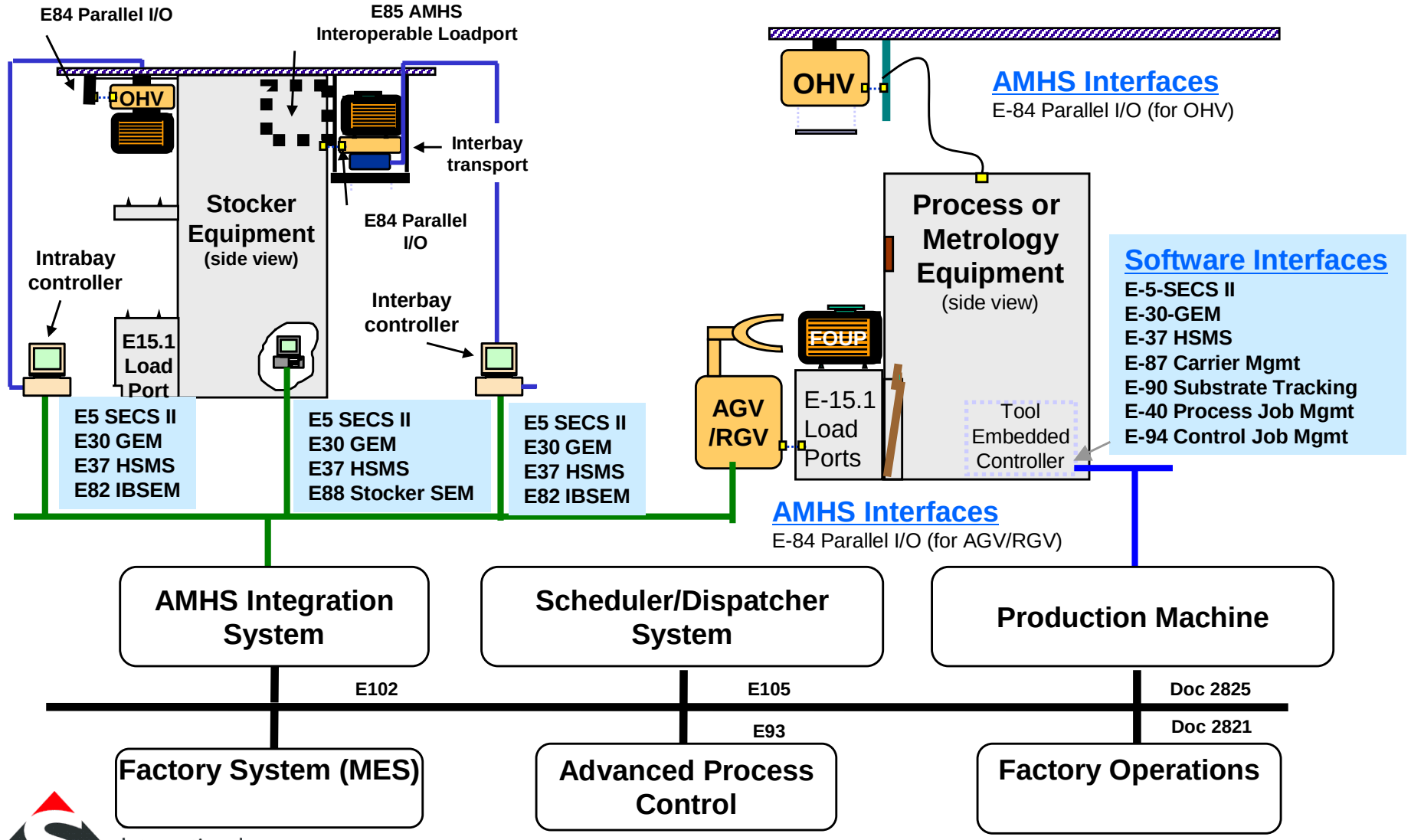
e-Manufacturing Definition

- **The complete electronic (computer systems) integration of all factory components using industry standards. E-manufacturing extends from the Equipment to the Equipment Automation Systems to the MES (Manufacturing Execution System) /YMS (Yield Management System) /EEC (Equipment Engineering Capability) and to the ERP (Enterprise Resource Planning). Users range from operators to technicians to engineers to managers.**
  - **Includes WIP tracking, Machine Tracking, Equipment Control and Monitoring, Scheduling and Dispatching, Automated Material Handling, Fault Detection and Classification, Run to Run Control, Advanced Process Control, Data Warehouses, Decision Support Tools, Quality Management Systems, Engineering Analysis Systems, e-Diagnostics, Maintenance Systems, Spare Parts Management, Test Systems……many other systems**

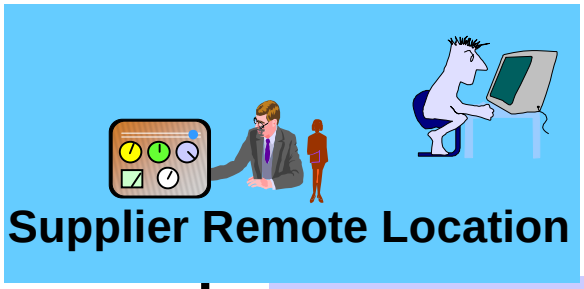


Many Faces of e-Manufacturing

300mm Fab Automation Standards View



Equipment Engineering Capability View



EES (Equipment Engineering System)

EE Data Sharing

Framework for EE Capabilities

EE Applications

APC App 1 | OEE App 1

APC App 2 | OEE App2

e-Diag App 1 | FDC App1

Relation between MES and EEC

MES

- Equipment Control
- WIP Tracking
- Factory Scheduling

Category & Level of EE Data

Global EE Data

EE Data Collection And Storage

Fire Wall

EE Access Control

EE Data On Demand

Equipment Engineering Network

Standardization of EE Data Interface

Standard EE Data Interface (Logically Separated)

Continuous Monitoring

Determination of EE Data

Equipment Performance Integrity

SECS/GEM Interface

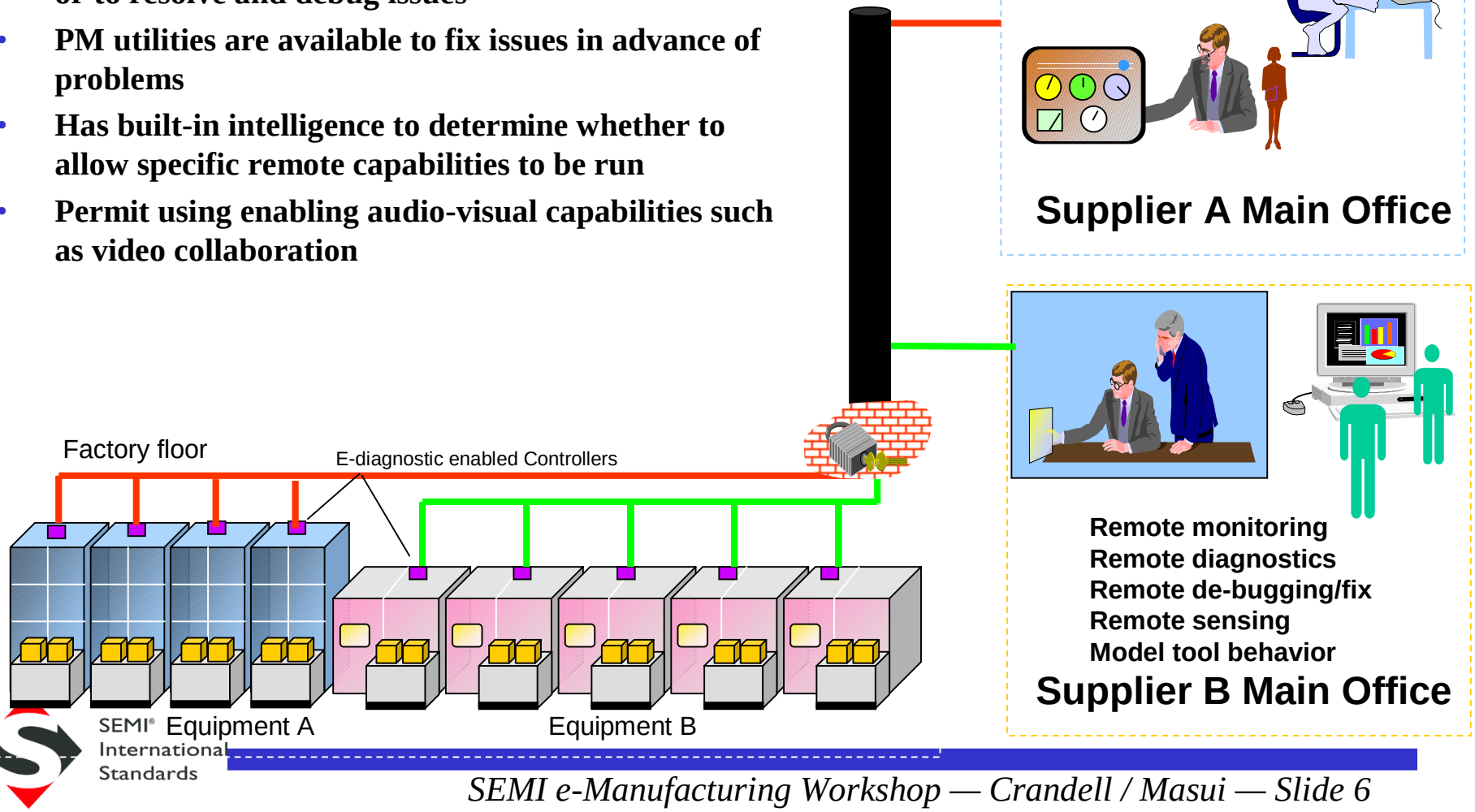
EE Data Sampling & Transmission

Factory Network

SEMI® International Standards

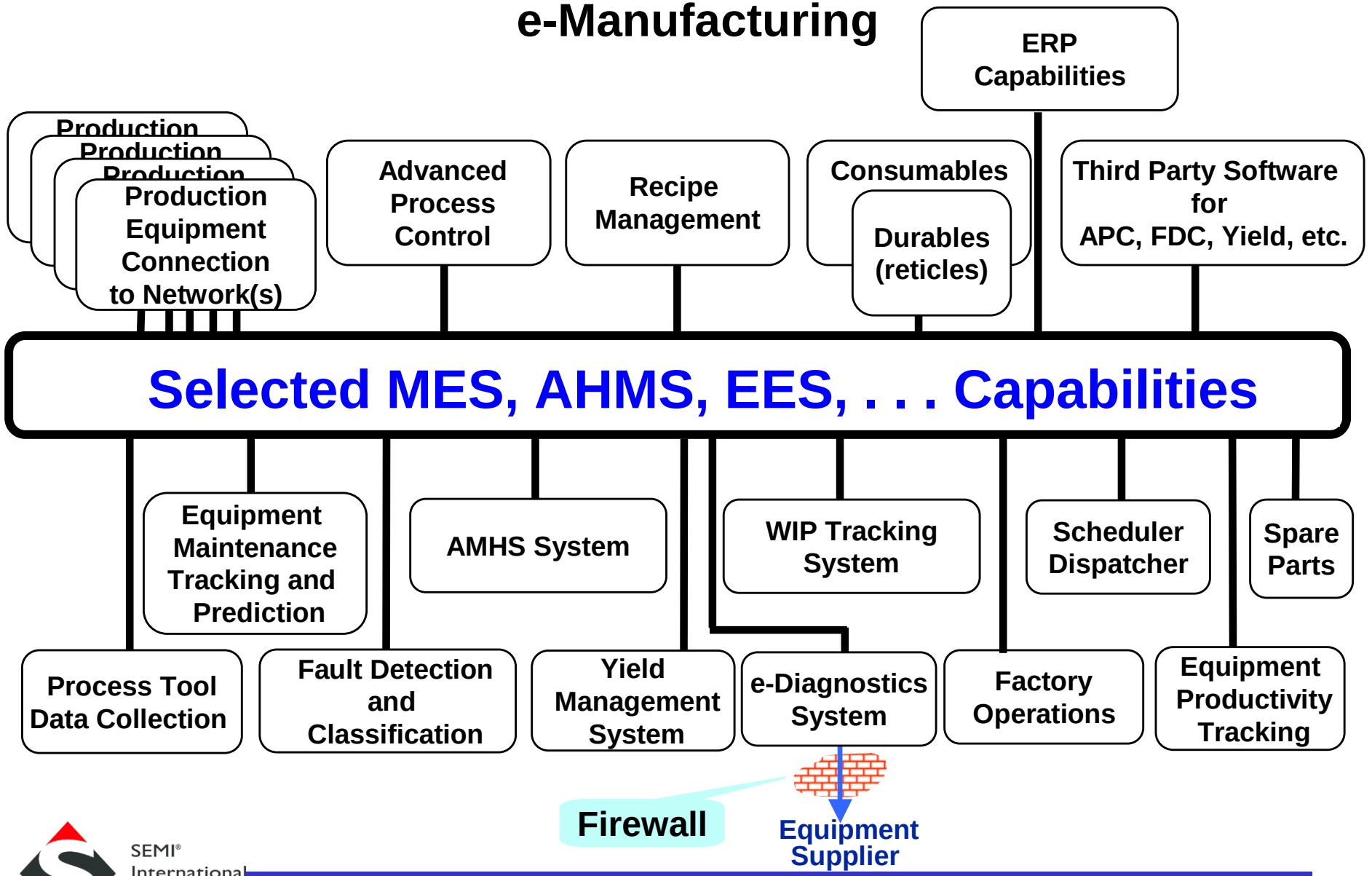
e-Diagnostics View

- **Equipment diagnostics data is available via remote access capability**
- **Equipment is remotely configurable for initial set-up or to resolve and debug issues**
- **PM utilities are available to fix issues in advance of problems**
- **Has built-in intelligence to determine whether to allow specific remote capabilities to be run**
- **Permit using enabling audio-visual capabilities such as video collaboration**

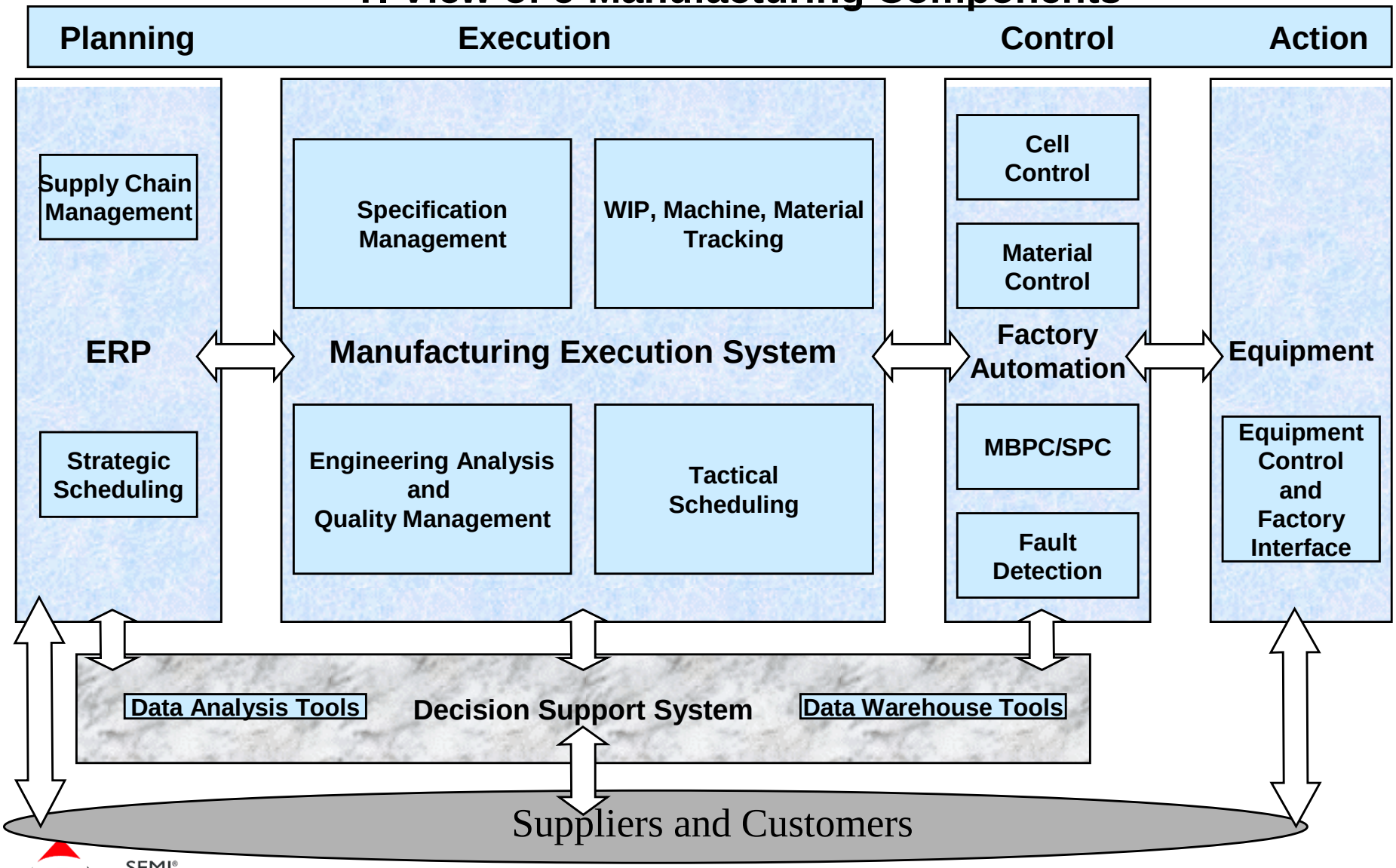


SEMI® International Standards

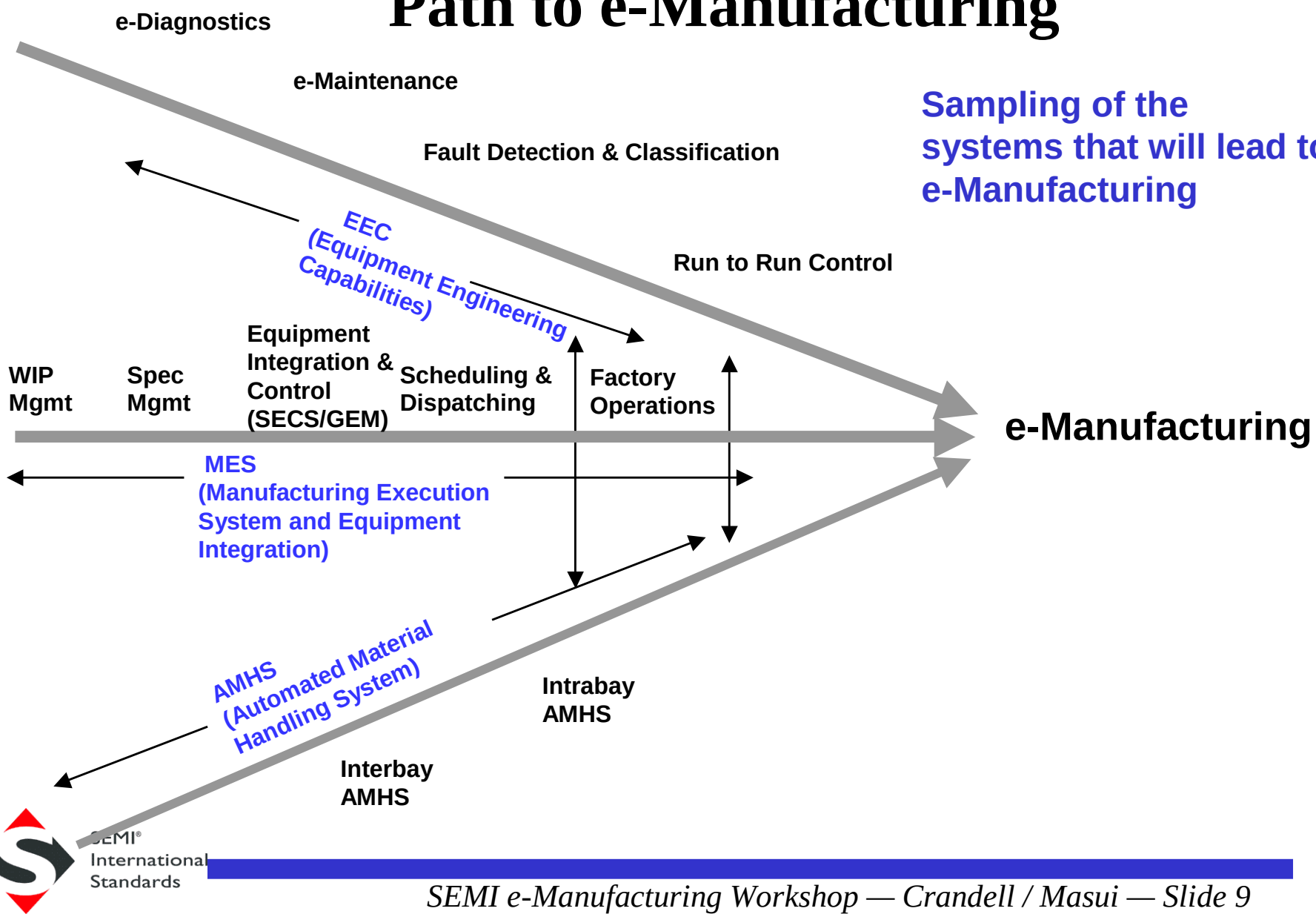
e-Manufacturing



TI View of e-Manufacturing Components



Path to e-Manufacturing



Sampling of the systems that will lead to e-Manufacturing

SEMI® International Standards

e-Manufacturing Capabilities

- **Integrate all aspects of the factory, enterprise, customers, and suppliers**
- **Provide the ability to take raw factory data and turn it into useful and timely engineering and business information**
- **Provide seamless information flow across the enterprise**
- **Web-enabled to provide broad access and ease to deploy**
- **Reconfigurable to accommodate changing business conditions**

e-Manufacturing System Requirements

- **Have Industry Standard Interfaces and API's**
- **Be robust and stabile (99.99% uptime)**
- **Data and Message integrity**
- **Be scaleable and flexible**
  - **Work from Pilot line to Full production factory**
  - **One factory or multiple factories**
- **Be cost-effective**
- **Be easy to install and maintain**
- **Be simple**

e-Manufacturing Benefits

- **Shorter Technology and Product Ramp Time**
- **Shorter Manufacturing Cycle Time**
- **Improved Yield**
- **Higher OEE**
- **Lower manufacturing cost**
- **All leading to higher return on investment**

e-Manufacturing Summary

Not just one system, it's a collection of diverse components that need to work together to provide cost-effective benefit to the user

- **Key aspects**
  - **Equipment, applications, and systems that are interconnected and interoperate**
  - **Automated data acquisition**
  - **Mainstream computer technology and Standards based**