# e-Manufacturing

Michio Honma

**Japan Electronics and Information Technology Industries Association**

**Electronic Devices Production Engineering Committee**

**Expert**

**VLSI Manufacturing Engineering Division**

**NEC Electron Devices, NEC Corporation**

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# What's happening in USA & Japan for e-Manufacturing

- **May 17**
  - **ISMT kicked off e-Diagnostics activity together with suppliers**
- **June 29**
  - **ISMT had a first workshop**
- **Aug 28**
  - **JEITA (then EIAJ) Electronic Devices Production Engineering Committee came to have "e-Mfg Study/Working Group". (hereafter "JWG") followed by a camp on equipment engineering on Sept. 15-17.**
- **Oct 21**
  - **ISMT and JWG had first F2F meeting in Austin**

# e-Manufacturing Positions

e-Business

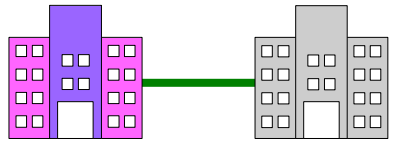
e-Manufacturing
product and pre-product's e-commerce
chip buyers support
spare parts logistics etc.

Equipment Engineering
Real time control(APC/AEC)
M-to-M difference management
Maintenance scheduling etc.

e-Diagnostics

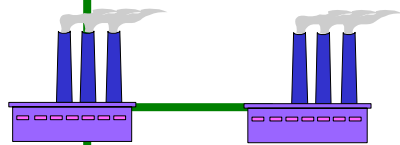
# e-Manufacturing Hierarchy

**Company to Company (E-Commerce)**



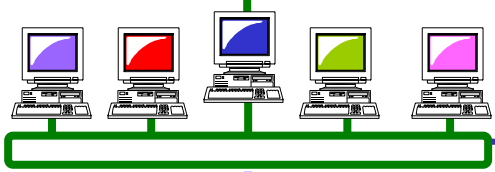

Suppliers

**Factory to Factory (E-Factory)**

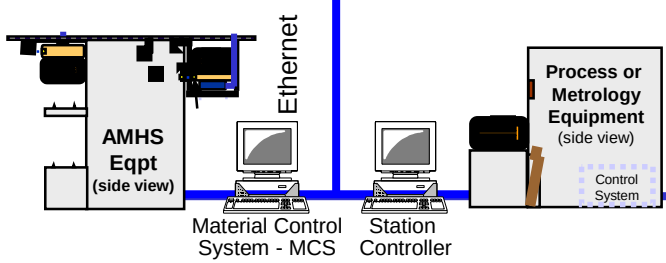



e-diagnostics capability

**Within a Factory (E-Factory)**




**Equipment/AMHS**




EES

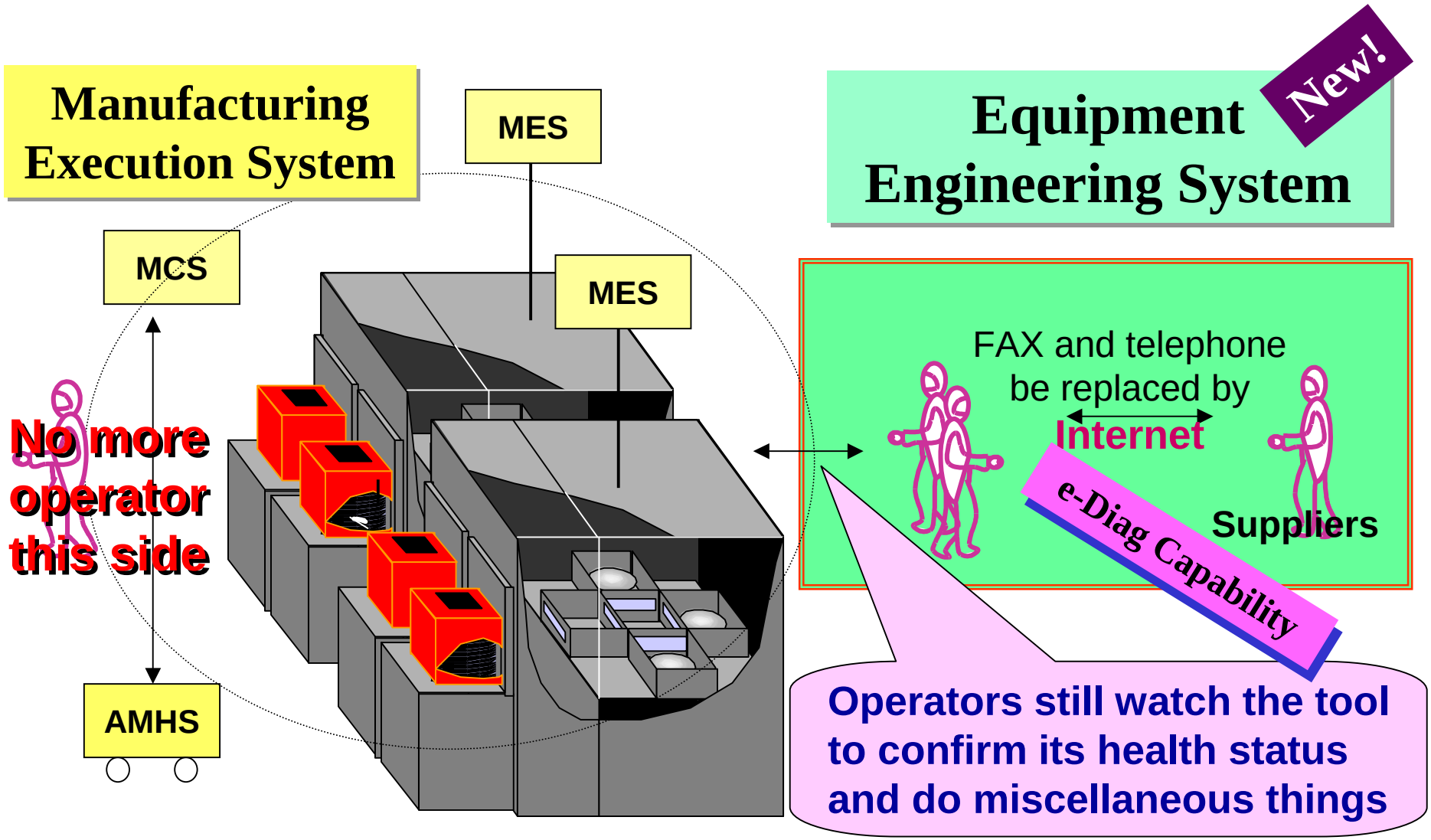
Equipment Engineering System

# Needs Building Up for e-Manufacturing

- e-Mfg includes
  - Product and pre-product's e-commerce
  - Chip buyers support
  - Spare parts logistics
  - Utilization of technical database of products/process
  - **Equipment Engineering activity support**
    - **Faster equipment improvement**
      - **Prompt & clear recognition of equipment deficiency reasons**
    - **Earlier detection of eq. malfunction**
    - **ISMT and JEITA has the common interest**
- e-Mfg requires a new frame work for

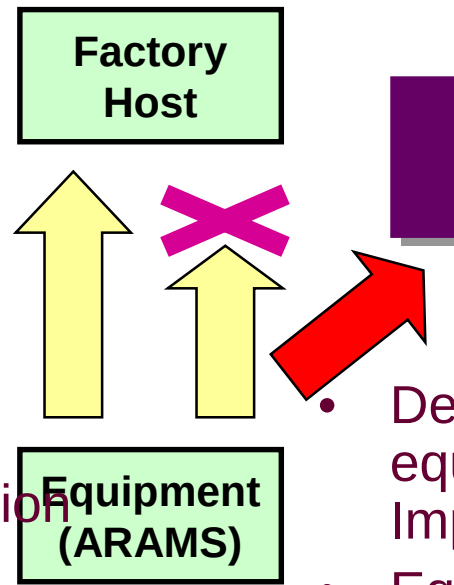
***Equipment Engineering System***

# What EE System will replace?



# Separate MES and EES

## Solve discrepancy between what host and EE operation want to know




### Examples of Host view info

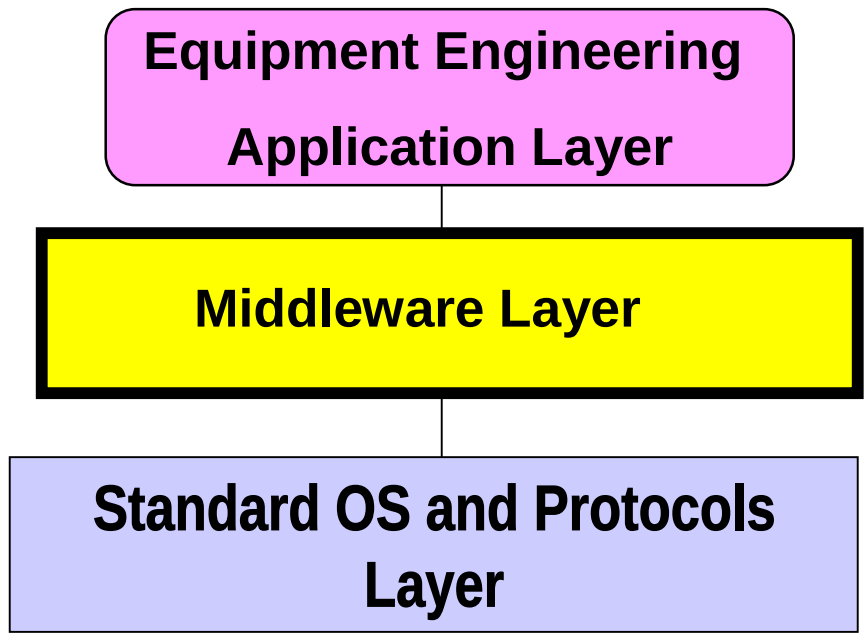
- Event reports for PW/NPW execution
- Alarm/warning report
- Macro tool operation status data for factory equipment management such as EFEM

### Examples of Equipment view info

- Detailed ARAMS data for equipment performance Improvement
- Equipment malfunction symptom data
- Lives of consumables for planning preventive maintenance
- Detailed processing event report
- In process monitoring data

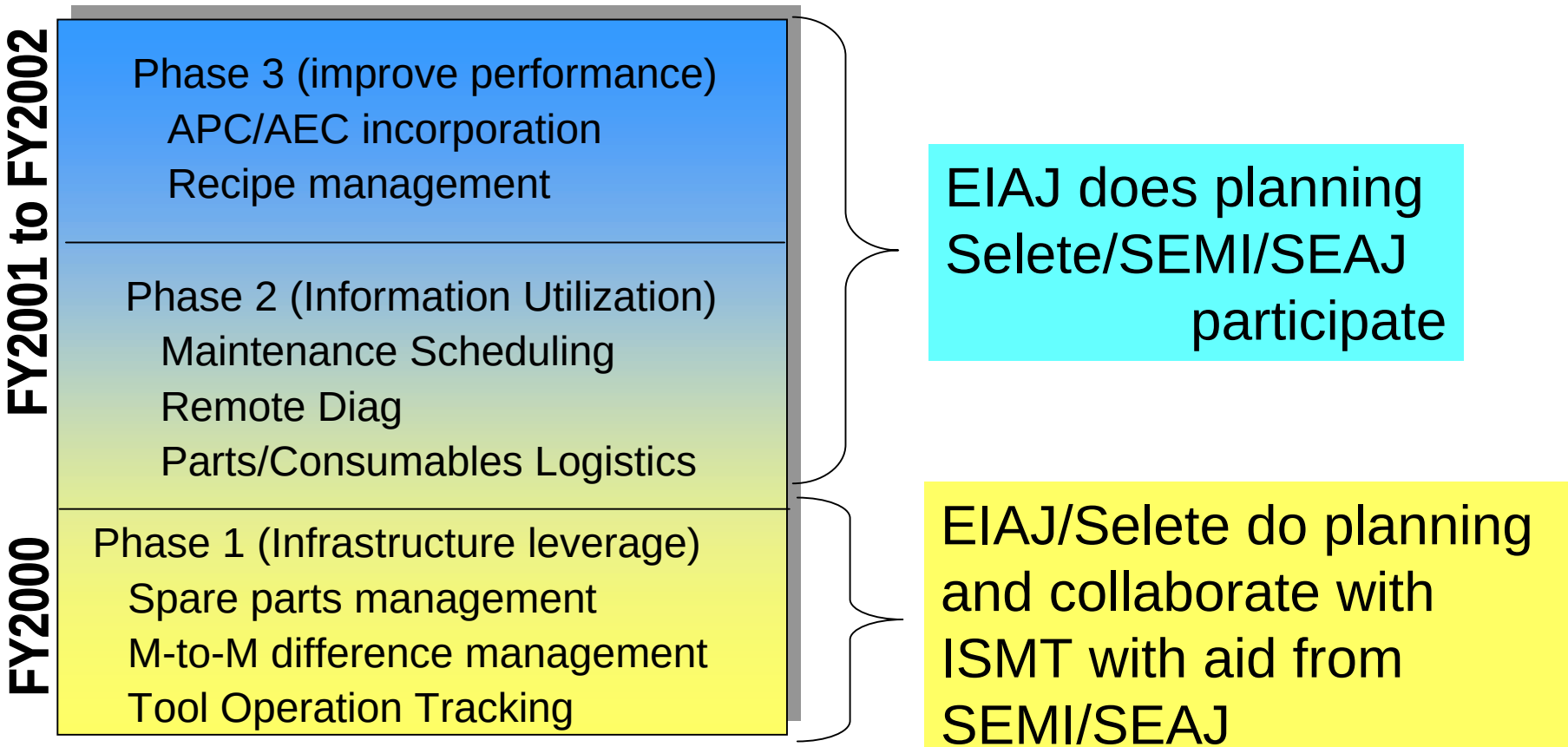
# What is IT requirement for EES?

- Independent EES IT structure from MES
  - –should assure wide freedom in implementation styles
- How can we assure freedom?
  - –Equipment Engineering Application Layer
  - –Middleware Layer
    - •provides open plat form
    - •key collaboration issue
  - –Standard OS and Protocol Layer
    - •Use the most common one
      - – TCP/IP, XML, ??



# Activity Plan for e-Manufacturing in Japan

## EIAJ Activity Overview

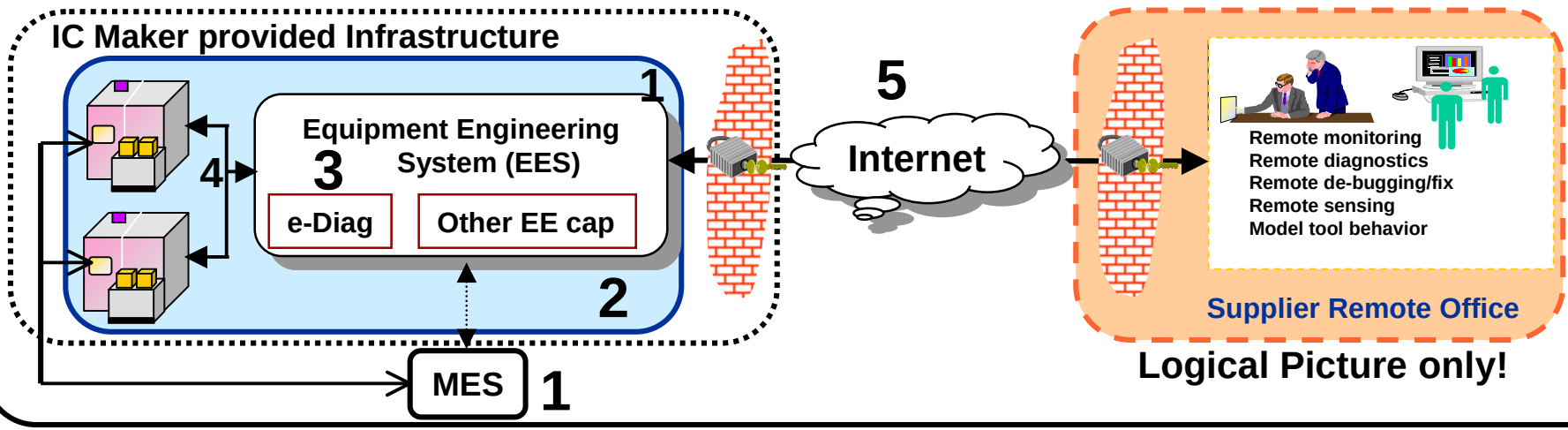


# JWG/ISMT Collaboration

- Sept 20, 2000 ISMT and JWG had the first VC
  - confirm international collaboration is a MUST
- Oct 21, 2000 ISMT and JWG had FTF meeting in Austin
  - had a consensus of EES and e-diagnostics system relation
  - agreed key system guidelines for e-diagnostics capability
  - made guideline development schedule

# Key System Guidelines for e-Diagnostic Capability

1. The e-Diag architecture shall be independent of current MES architecture
   - e-Diag performance (up/down) shall not affect MES and tool performance
   - e-Diag and MES should be able to share information
2. The e-Diag architecture shall be server based
3. The e-Diag architecture shall be Open (platform and application)
4. Open standards are required between the tool and server
   - Common data collection is open standards (e.g., EPT)
   - Specific data collection is open protocol (e.g., specific sensor output over FTP)
5. Open standards are required between the sever and supplier site
6. Potential solutions must address worker, product, and equipment safety.
7. Potential solutions must address security: network, communications, data encryption and other relevant issues.



# Activity Organization for Global Collaboration

## EIAJ / ISMT Guideline development schedule

**2001**

**Phase 2 (Performance Improvement)**
- APC/AEC (R2R, FDC)
- Recipe management
- Maintenance Scheduling
- M-to-M difference management
- Parts/Consumables Mgmt.

**2000**

**Phase 1 (Infrastructure Leverage)**
- EE platform concept
- e-Diagnostics
- Tool Operation Tracking

# Summary

- **Need to have an industry consensus for e-Manufacturing**
  - Equipment engineering system shall have open structure so as to maximize tool performance.
  - Equipment engineering architecture shall be independent of current CIM system architecture.
- **Collaboration among device makers, equipment makers, and, software venders is a must**
- **Need to develop new standardization process**
  - Prototype system development and standardization process is spiral.

# EES/e-Diagnostics 'new' Process