

Approach to the Implementation of EDPMS and the role of Equipment Suppliers

Shinobu Hirano: System V Co.
Zak Ishizaki: ULVAC JAPAN, Ltd.



SEMI Workshop on e-manufacturing & APC/FDC—Zak Ishizaki — Slide 1

Approach to the Implementation of EDPMS and the role of Equipment Suppliers

- 1. Introduction**
- 2. Outline of EDPMS (e-Diagnostics Preventive Maintenance Server)**
- 3. Effect from the Implementation of EDPMS and Business Model**



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1. Introduction: Problems of Semiconductor Equipment Users and Suppliers, and How to Solve Them

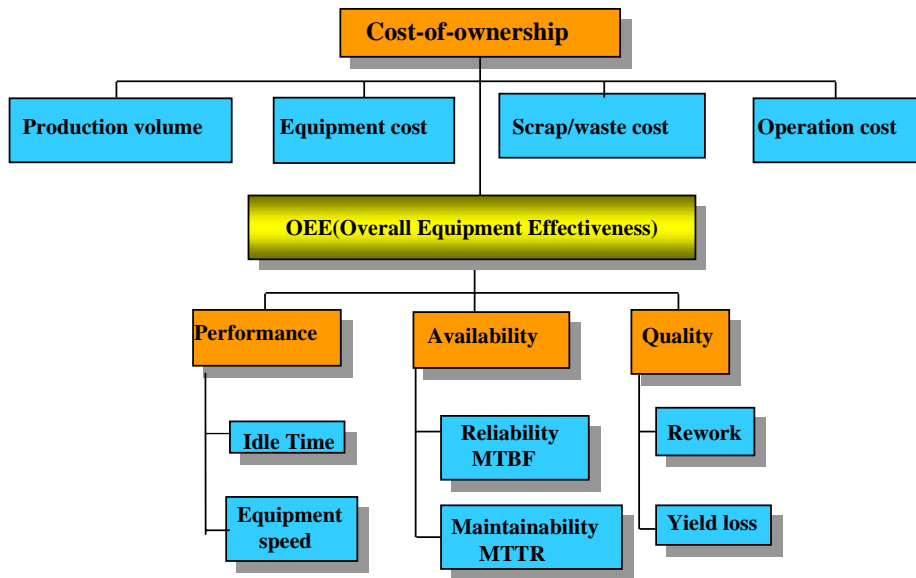


Fig.1 Equipment Performance Metrics

Improvement in OEE will boost the earnings of semiconductor equipment users.



1-1) Issues which semiconductor equipment users expect from equipment suppliers

*Technical support

- Technical consulting
- Overall technical advice
- Equipment supplier's know-how
- Fault analysis capability

*Equipment intelligence

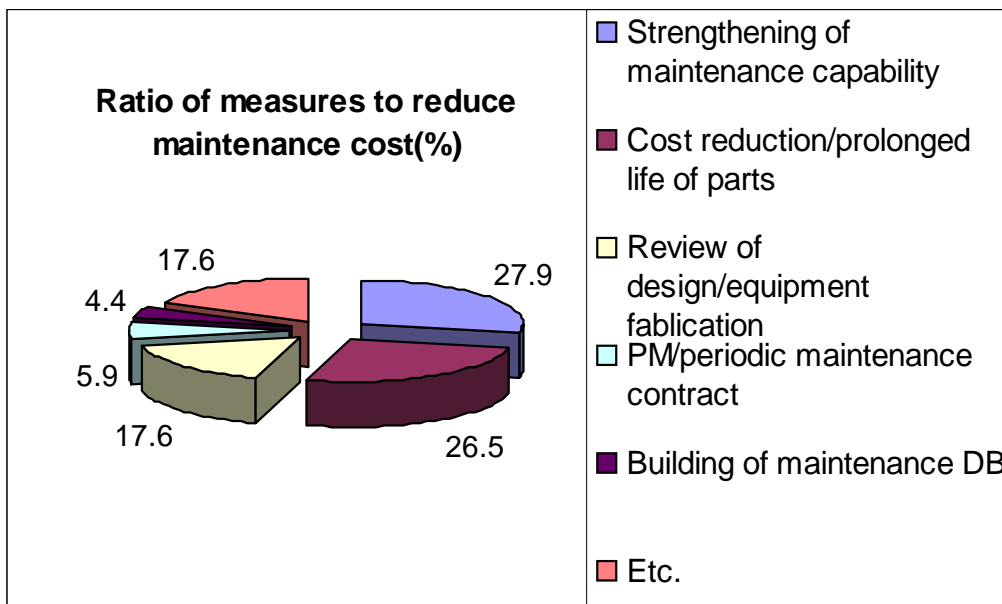
- PM (preventive maintenance) support
- Online maintenance assist
- Multimedia type manuals assist
- Improvements for diagnostic capabilities

*Improvements for field service capabilities

- PM (preventive maintenance)
- Quality of services
- Quality of service personnel
- Quickness of response
- 24-hour, 365 days service



1-2) Ratio of measures to reduce maintenance cost



Graph-1
Ratio of measures to reduce maintenance cost(%)
source:Equipment service99(ED research)



1-3) Depression of equipment suppliers and “Will there really be a future for us?”

• Recovery

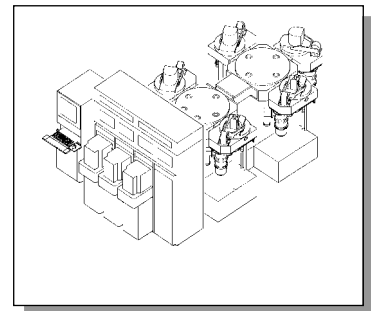
- Low collection speed and quality of equipment fault data
- Taking much time to identify causes of trouble
- Always involving confirmation to purge of recurrence and unstable elements

• Record

- “Choco-tei” is always under the cover of darkness.
- No repair/modification history for equipment is input.
- There are variations of equipments.
- There is no index indicating the health of equipment.

• Resource

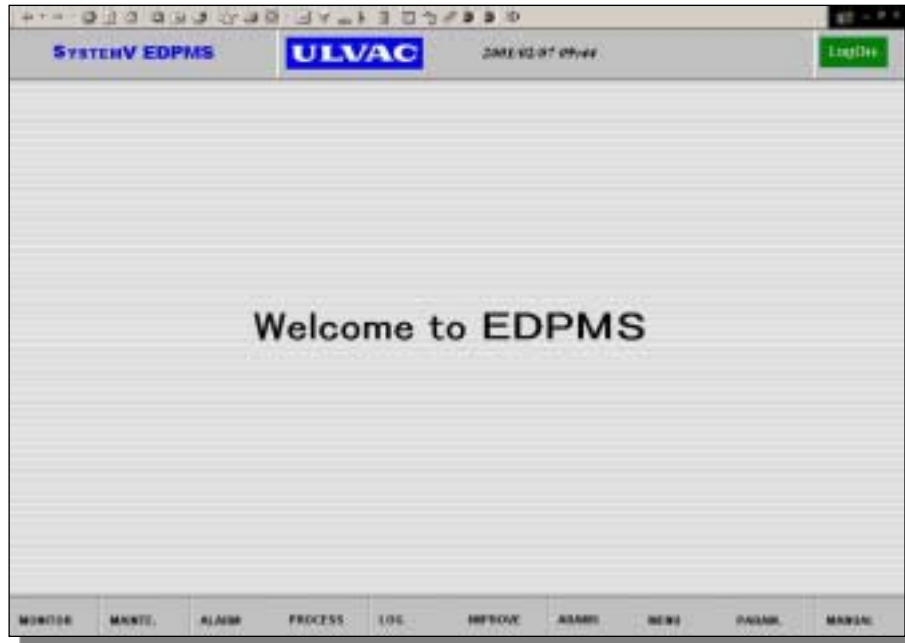
- Matter of quantity and quality of resource (service personnel)
- The limit of human sea tactics and service network is almost nearly.



It is difficult to implement improvement in OEE with conventional techniques and infrastructure.



1-4) EDPMS(e-Diagnostics Preventive Maintenance Server) will solve various problems.



2.The requirements of EDPMS between user and supplier

Item	User	Supplier
• Watch the state of equipment and process modules in the real time.	<input type="radio"/>	
• Monitor equipment performance	<input type="radio"/>	<input type="radio"/>
• Look up the history of equipment process	<input type="radio"/>	
• Collection process data from equipment and measurement tool for APC.	<input type="radio"/>	
• Analyze equipment failures	<input type="radio"/>	<input type="radio"/>
• Support the preventive maintenance	<input type="radio"/>	<input type="radio"/>
• Support parts inventory	<input type="radio"/>	<input type="radio"/>
• Support electronic operational manual	<input type="radio"/>	
• EDPMS platform	<input type="radio"/>	<input type="radio"/>
• EDPMS application software	<input type="radio"/>	<input type="radio"/>
• Data Security	<input type="radio"/>	<input type="radio"/>

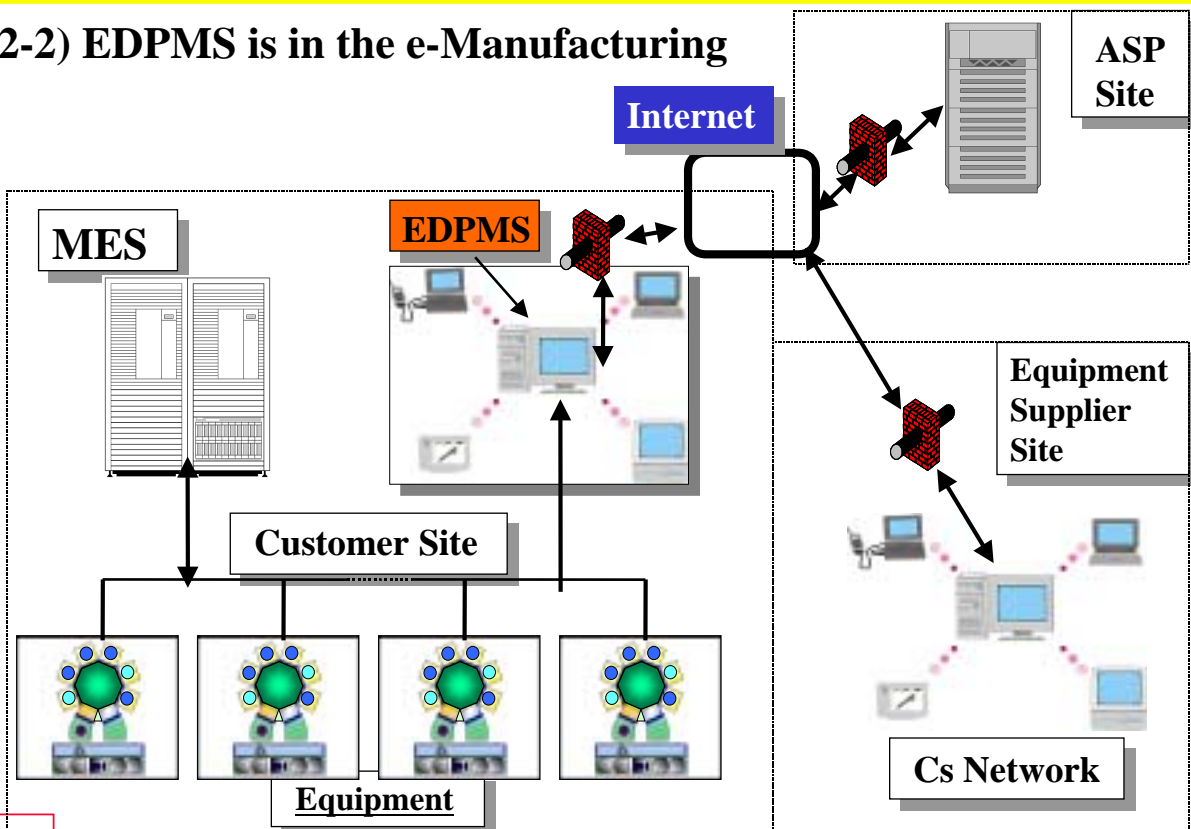


2-1) Specifications of EDPMS

- Prepare a platform for EDPMS separately from the equipment system.
- Make the platform for EDPMS also respond to different models/other equipment. (Secure connectability to the industrial standard.)
- Make applications selectable by users.



2-2) EDPMS is in the e-Manufacturing



2-3) Equipment Information Model: Data available for Semiconductor Equipment Users Equipment Performance Information (Information available for Equipment Wholesomeness)



Equipment Diagnostic Information (e-Diagnostics)

- RAM (E10) Data



Process data: Lot Process Log Data

- Lot Name/Recipe Name/Process Name
- Process Time (Start to Completion)
- Process Start Time/Process Completion Time
- Error Log
- Process Data



PM Information

- Shield Life
- Target Life
- Shutter Life
- Wafer Chuck Count
- Number of Processing Wafer



2-4) Equipment Information Model: Data available for Semiconductor Equipment Suppliers Equipment Information (Information for Maintenance of Equipment)



Equipment Diagnostic Information (e-Diagnostics)

- RAM (E10) Data



PM Information

- Device Counter
- Heater ON Time
- IG Filament ON Time
- Gas ON Time
- Cathode Water/Pump Water Monitor



Analyze equipment failure(In case of)

- Error Log
- Event Log
- Lot Process Log
- Process Data
- Host Communication Log



3. Effect from the Implementation of EDPMS and Business Model

3-1) Effect from Implementation

• Recovery

- Reduction in downtime
- Restraint on un-scheduled downtime by EDPMS

→ **Reduction in MTTR**

• Record

- Grasping of accurate system status/history
- Sharing of statistical analysis information

→ **Enables sharing of system information.**

• Resource

- Enables proper assignment of resource (service personnel) and making service quality uniform.
- Reducing a burden on semiconductor equipment users

→ **EDPMS will become a new tool for service.**



3-2) Business Model of **ULVAC**

How to Sell EDPMS?

- **Make it available as a CS solution package.**
For example:
List it as a package in the annual maintenance contract.
- **Make it available as different models/other suppliers equipment.**
- **Taking the advantage**

