

Business Model Study on Equipment Engineering System (EES) by Equipment Manufacturers

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2. Function and configuration of EES
3. Business models
4. Expected services and advantages
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EES Activities of SEAJ

| | |
|-----------------------------|--|
| | <h3>EES Business Issue Study</h3> |
| <h3>JEITA (Selete)</h3> | <p>Establish Business Model in which Device Manufactures and Equipment Suppliers are both profitable.</p> |
| |  <h3>Entrusts and Reports</h3> |
| <h3>SEAJ</h3> | <p>Developing USAD with JEITA on Business Model in which Equipment Suppliers improve profitability.</p> |

Members of EES Committee

| | JEITA | | SEAJ | |
|-------------------|---|--------------------------|--|---|
| Leader | Michio Honma | NEC | Yasutsugu Usami | Hitachi High-Technologies |
| Sub Leader | Giichi Inoue | Toshiba | Seiichi Nakazawa Shuichi Kono Kunio Ohishi | Fuji Research Institute Canon Ebara |
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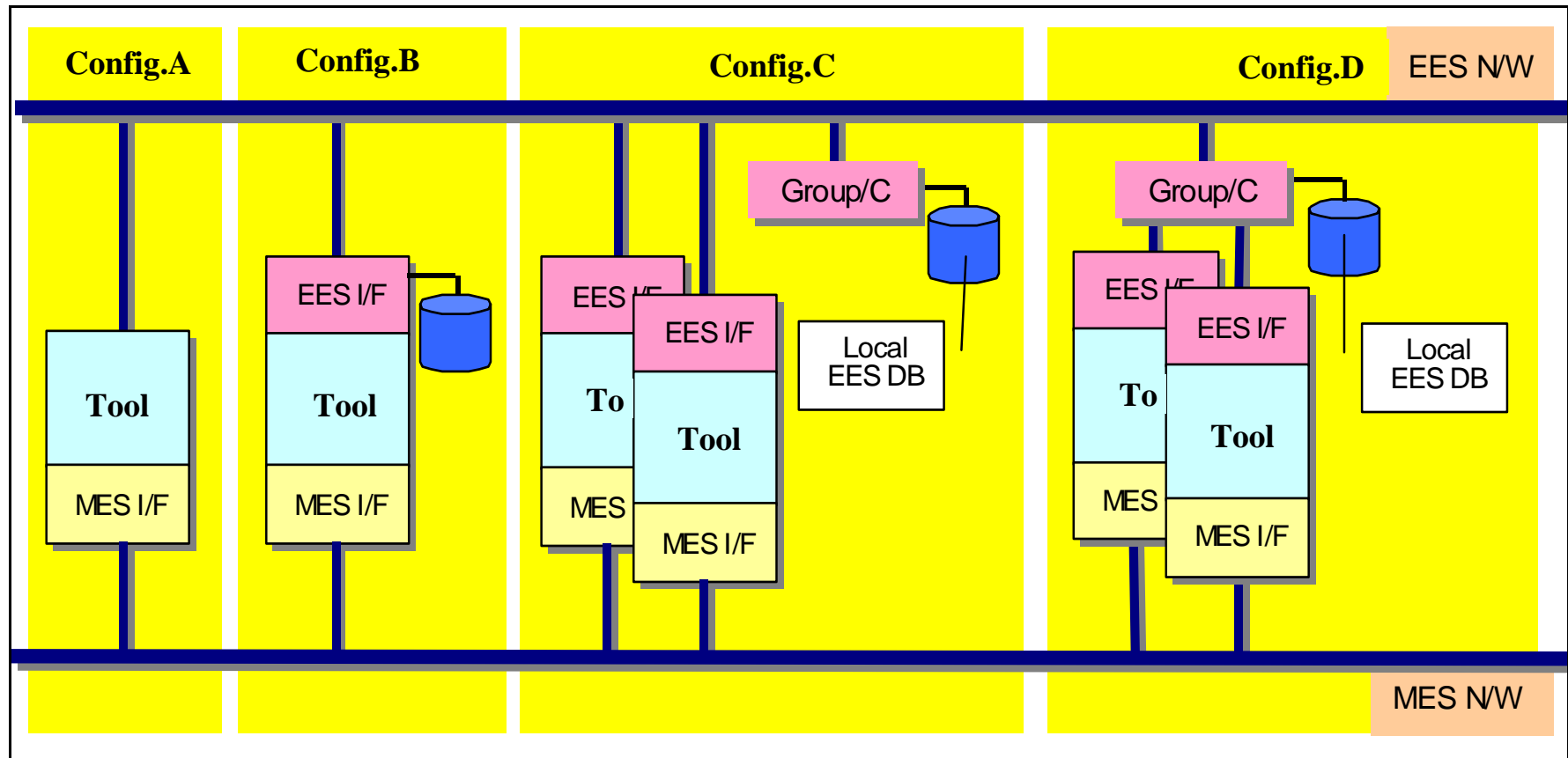
Position of SEAJ

- This is a study report on how the open architecture that is mentioned in EEC Guide Line is put into practice.
- SEAJ's Stance
 - As Equipment Suppliers, SEAJ is studying a new job allotting scheme which will realize EES.
 - SEAJ is providing members with place to study.
 - SEAJ is preparing a set of subjects for discussion with Device Makers on EES implementation
 - Supplier's benefit common to SEAJ members
 - Device Manufacture's benefit

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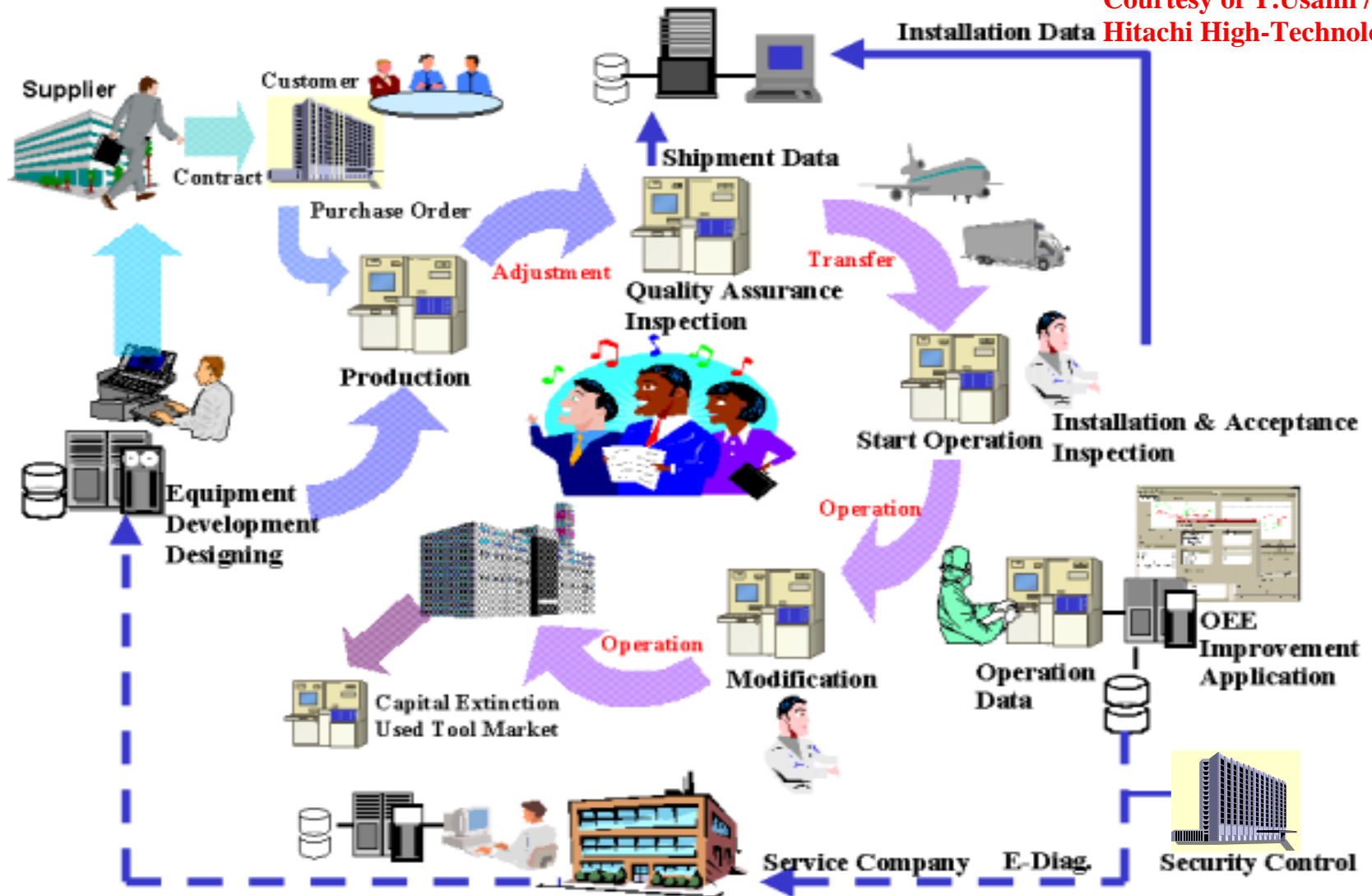
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Location of local EES

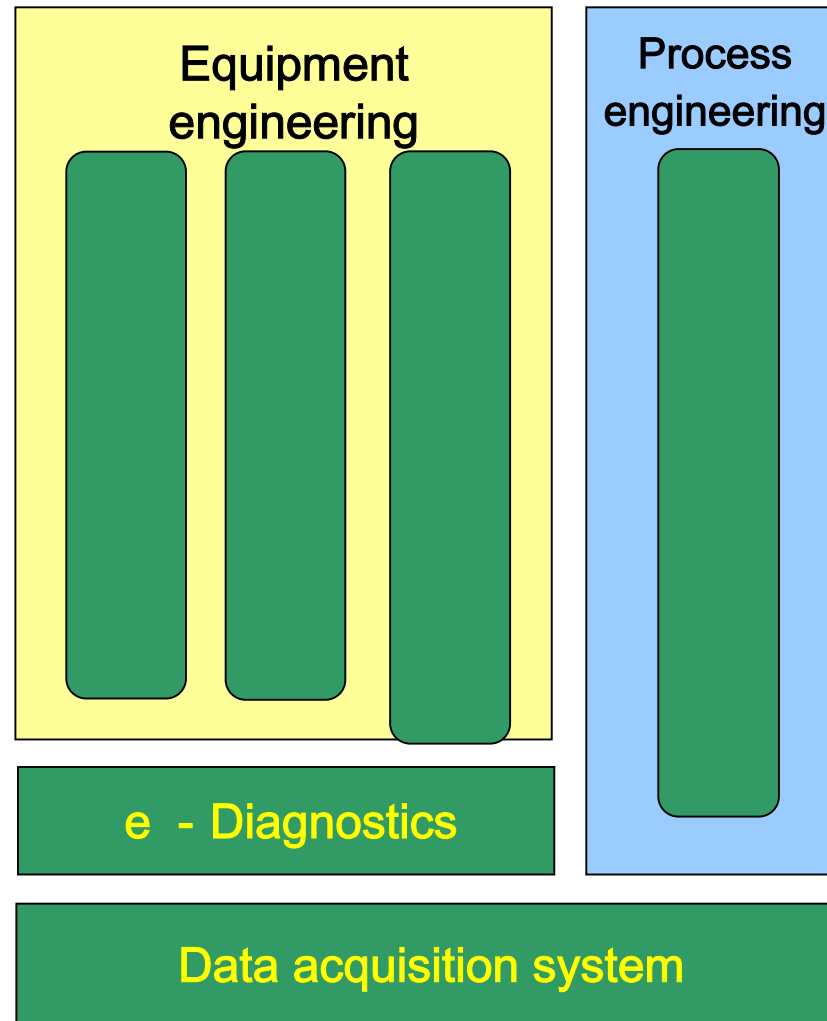


Life Cycle Model of Semiconductor Manufacturing Equipment

Courtesy of Y.Usami / Hitachi High-Technologies



Configuration of EES



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Business models

- The business model based on the system sales
- The business model based on the right to use data
- The business model based on the provisioning of service

The business model based on the system sales

- This model is same as conventional model. The most familiar way for current tool suppliers.
 - EES is sold as a part of a tool. Or EES is sold as an additional system of a tool.

The business model based on the right to use data

- This business model is based on a new concept and different substantially from conventional model.
 - The ownership of local EES data is clearly defined. The data can be used per the approval of using the data.

The business model based on the provisioning of service

- The basics of this model is the sharing of profit which is obtained by introducing EES by a device maker and tool suppliers. In this model, device maker pays to suppliers in exchange for the service provided.
 - Service is defined as provisioning of OEE (Overall Equipment Effectiveness) improvement, NPW (Non product wafer) reduction and/or yield improvement by effectively applying EES application, consultation and know-how with EES data.

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Expected services and advantages

| Category | Service | Payable | Quantify | Note |
|---|--|---------|----------|---------------------------------|
| Installation and maintenance support | Shorten equipment installation and start-up time | △ | Possible | Cost reduction |
| | EE data provisioning upon shipping | △ | | Provisioning fee |
| | Tool to tool matching | ○ | Possible | Service fee |
| Equipment and process performance improvement | NPW reduction service | ○ | Possible | Reduction rate 率 |
| | Yield improvement service | ○ | Possible | Improvement rate |
| | Tool to tool matching service | ○ | Possible | Service fee OEE improvement |
| | Process performance improvement by APC | ○ | Possible | ? |
| | Tool utilization improvement by FDC | ○ | Possible | ? |
| Preventive maintenance support | Reduce maintenance work service | △ | | Cost reduction |
| | Improve maintenance personnel's skill service | ○ | | |
| | Improve and modify equipment service | ○ | Possible | Service fee |
| | Improve equipment utilization service | ○ | Possible | Tool utilization |
| | Improve MTBF service | ○ | Possible | Improvement rate |
| | Shorten MTTR service | ○ | Possible | Shortening rate |
| | Maintenance planning support service | △ | | Service fee |
| Parts and consumables service | Parts/Consumables inventory control service | ○ | Possible | Service fee OEE improvement |
| | Replacement timing advisory support service | △ | Possible | Service fee MTBF improvement |

○ Paid base △ Paid base possible

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Definition of data

| Location | | Ownership | | Selete definition |
|--|----------------|--------------|---------------|---------------------------|
| | | Device maker | Tool supplier | |
| Tool output data | Primary data | | X | Trace data and event data |
| | Secondary data | X | X | |
| Semiconductor production data (get from MES) | | X | | Context data |
| Tool maintenance history data | | X | X | - |
| Material data | | X | | - |

Data usage definition per services

| Category | Service | Data | | | | |
|---|---|---------|-----------|---------------------|------------|----------|
| | | primary | secondary | Maintenance history | production | material |
| Installation and maintenance support | Shorten equipment installation and startup time | X | X | | | |
| | EE data provisioning upon shipping | X | X | | | |
| | Tool to tool matching | X | X | | | |
| Equipment and process performance improvement | NPW reduction service | X | X | | X | |
| | Yield improvement service | X | X | | X | |
| | Tool to tool matching service | X | X | | X | |
| | Process performance improvement by APC | X | X | | X | X |
| | Tool utilization improvement by FDC | X | X | | X | X |
| Preventive maintenance support | Reduce maintenance work service | X | X | X | | |
| | Improve maintenance personnel's skill service | X | X | X | | |
| | Improve and modify equipment service | X | X | X | | |
| | Improve equipment utilization service | X | X | X | | |
| | Improve MTBF service | X | X | X | | |
| | Shorten MTTR service | X | X | X | | |
| | Maintenance planning support service | X | X | X | X | X |
| Parts and consumables service | Parts/Consumables inventory control service | X | X | x | X | X |
| | Replacement timing advisory support service | X | X | X | X | X |

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Contract on EES

- The form of contract on the business model based on the system sales
 - The contract is on EES licensing, hardware sales and EES maintenance contract. EES can be sold as a part of functions of main tool as well.
- The form of contract on the business model based on the right to use data
 - The contract is on the approval of using data which is controlled and maintained by EES. The owner of the data permits the user the right to use the data.

Contract on EES

- The form of contract on the business model based on the provisioning of service
 - The contract is on the provisioning of service. The service will be provided by tool supplier or third party which is dedicated to provide services.

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Summary

- Proposed EES related new business models have various problems respectively. In order to solve those issues, device manufacturers and suppliers are to discuss win-win business models
- Investigation of new work sharing scheme and new business model to be done by the prototyping of EES system.