
Closing Remarks

www.sematech.org/public/resources/ediag/index.htm

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3/23/01

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Improve Equipment Productivity

Year Technology Node Wafer Diameter	1999 180 nm 200 mm	2002 130 nm 300 mm	2005 100 nm 300 mm	2008 70 nm 300 mm	2011 50 nm 300 mm	2014 35 nm 450 mm
Bottleneck production equipment OEE [3] (SEMI E79)	75%	87%	89%	91%	92%	92%
Average production equipment OEE [3] (SEMI E79)	55%	65%	71%	78%	80%	82%
% Capital equipment reused from one process node to next	> 70%	> 0%	> 80%	> 80%	> 80%	>20%
Production equipment lead time (months from order to full throughput capability) [5]	< 9 months	< 8 months	< 7 months	< 6 months	< 5 months	<5 months
Process equipment availability [6] (SEMI E10)	> 85%	> 90%	> 93%	> 95%	> 95%	> 95%
Metrology equipment availability [6] (SEMI E10)	> 90%	>95%	>95%	>98%	>98%	>98%
% of equipment to factory systems interface standards defined [2]	75% 300 mm	100% 300 mm	100% 300 mm	100% 300 mm	80% 450 mm	100% 450 mm
% conformance: equipment to factory systems interface standards [2]	100% 200 mm	100% 300 mm	100% 300 mm	100% 300 mm	100% 300 mm	100% 450 mm

SOURCE: 1999 ITRS

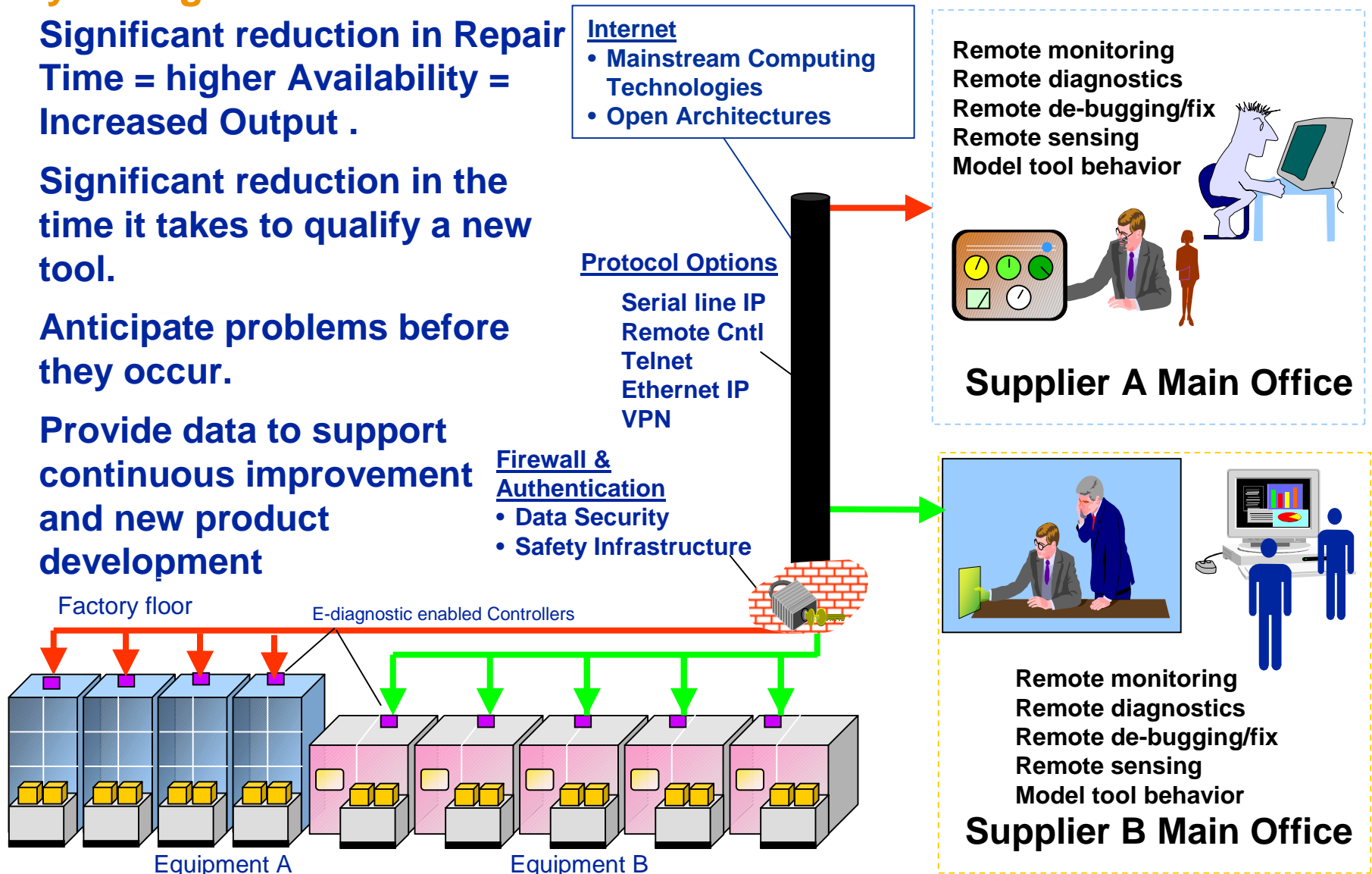
Bottom Line

- **Equipment productivity (availability and overall effectiveness) are not meeting roadmap targets. Need to update tables with actuals + gaps and drive improvements through potential solutions**
- **300mm software interface standards are defined, but industry implementation is not meeting expectations**

e-Diagnostics Vision

Why e-Diagnostics?

- Significant reduction in Repair Time = higher Availability = Increased Output .
- Significant reduction in the time it takes to qualify a new tool.
- Anticipate problems before they occur.
- Provide data to support continuous improvement and new product development



e-Manufacturing Vision

Our Supplier's Viewpoint

Intel

Equipment life-history in Intel



Suppliers

Intel chart by D. Pillai

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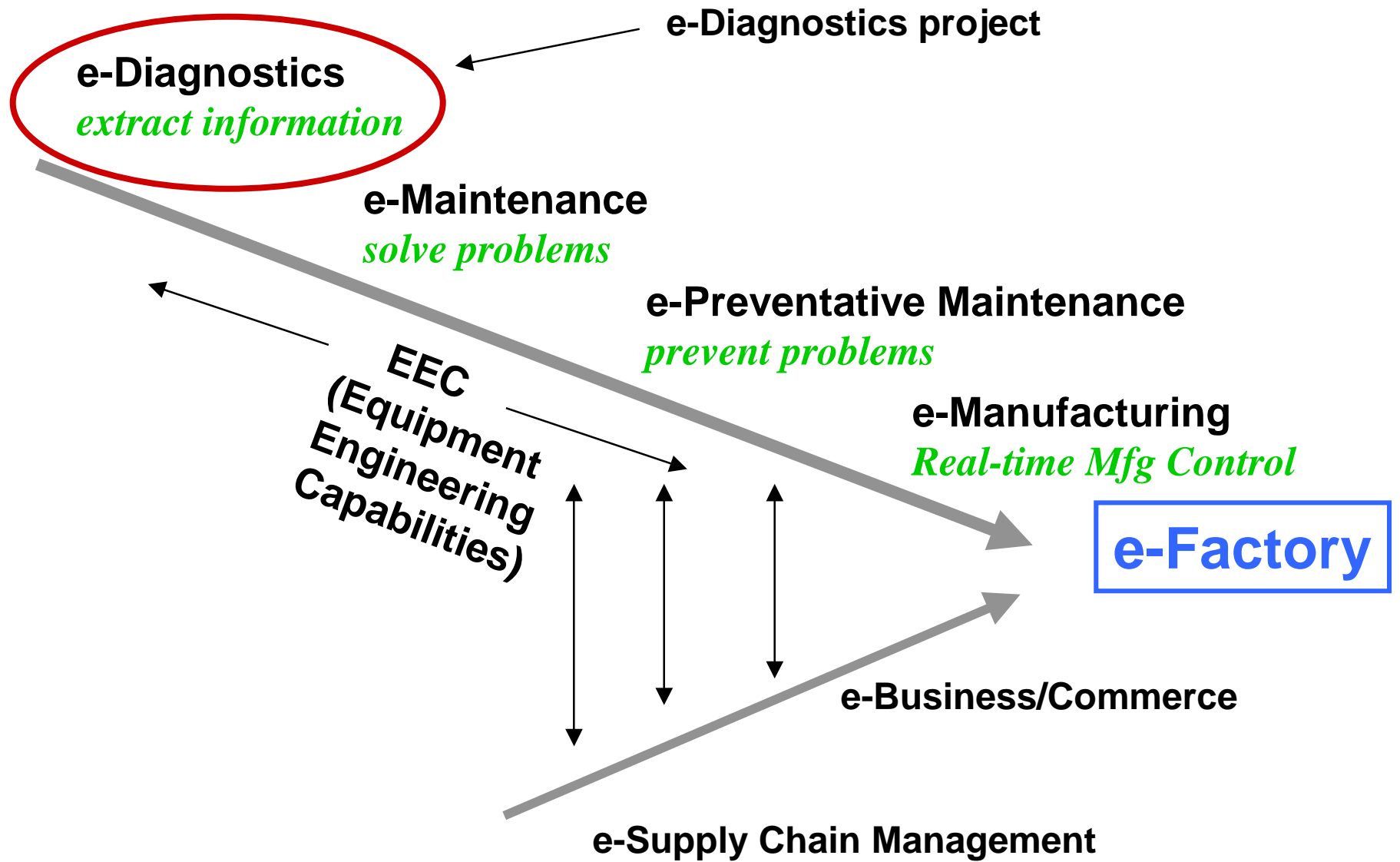
e-Diagnostics Summary

- **300mm Standards implementation cannot be compromised by this effort!!**
- **e-Diagnostics is an outstanding ISMT example of IC makers and suppliers working together on a win-win initiative**
 - e-Diagnostic guidelines and capability definitions developed in H2'00
 - For the industry to reap the benefits, we must adhere to the Guidelines
 - e-Diagnostics solutions should follow these Guidelines
- **ISMT and JEITA have started a collaboration on the concept of the Equipment Engineering Capabilities (EEC).**
 - Produced a set of global system guidelines for the e-Diagnostic capability
 - e-Diagnostic solutions should follow these guidelines
 - Future collaboration will expand the guidelines into e-Manufacturing

The Future Needs are Global

- **Chip makers and equipment suppliers must develop a common strategy for the information systems used for Equipment Productivity Improvement**
- **This strategy must be:**
 - **a GLOBAL consensus and unified strategy**
 - **one that addresses the weak and missing components**
 - **one that solves integration problems**
 - **one that leads to open consensus standards**
 - **one with a consensus business model**
- **The Selete/ISMT EEC collaboration will provide this strategy and the necessary guidelines**
 - **First rollout @ SEMICON West**
 - **e-Diagnostics is addressing tool data availability**

Path to e-Factory - ISMT



e-Diagnostic Next Steps

- **Refine implementation roadmap (Q2 2001)**
- **Transition guidelines (requirements) to standards (2001)**
- **Prototype e-Diagnostic/EES solutions to prove guidelines (2001)**
- **Continue global collaboration on other e-Manufacturing topics (2001)**

Thanks for your engagement and support!!