

International SEMATECH e-Diagnostics Program

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

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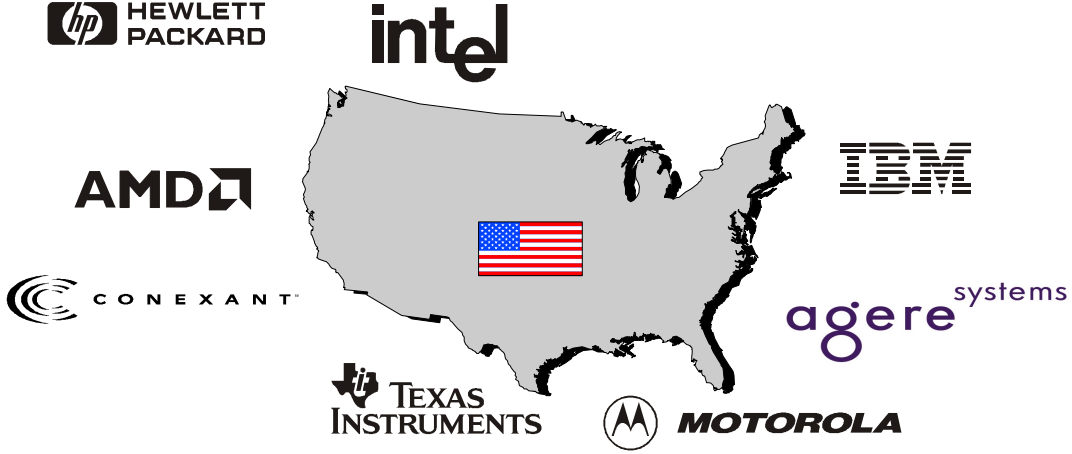
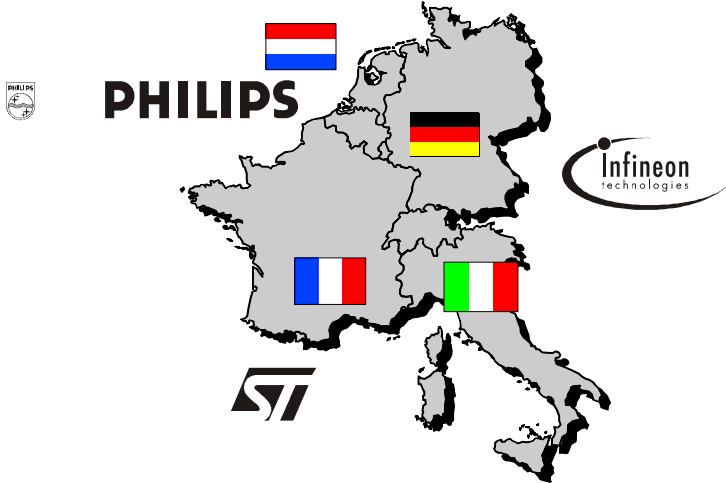
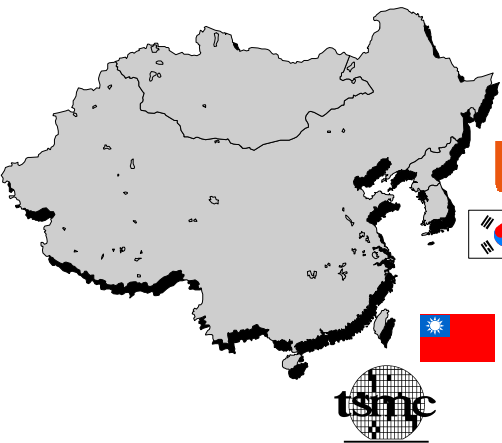
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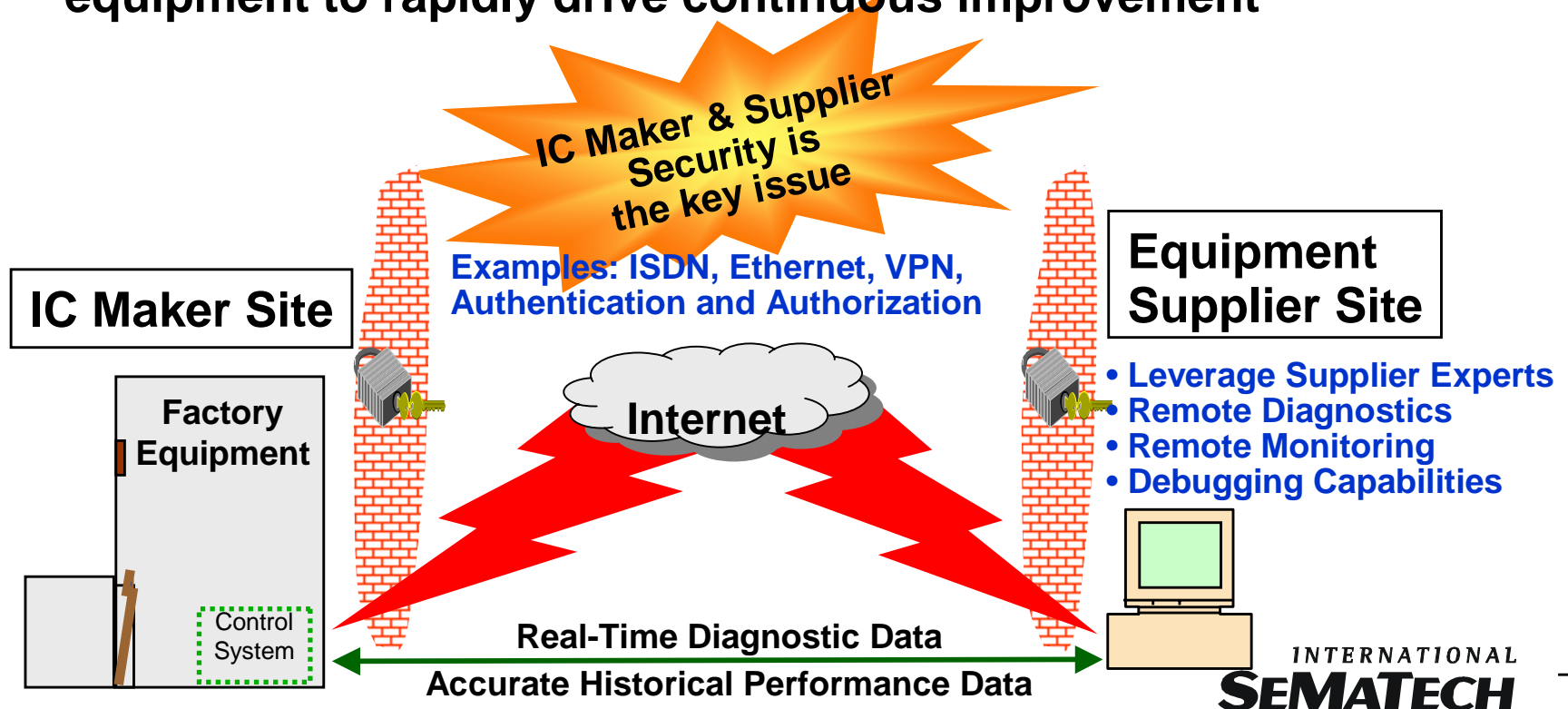
International SEMATECH 13 IC Makers Cooperating



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e-Diagnostics Overview

- Remote monitoring & diagnostics allow supplier experts to rapidly fix factory equipment issues from their sites
- Time to money – Remote diagnostics enable IC makers and Equipment suppliers to reduce upfront Install and Qual durations
- Suppliers need accurate historical performance data from factory equipment to rapidly drive continuous improvement



e-Diagnostics Strategy

MISSION:

Create guidelines

share best practices

drive commercialization of open architecture

Internet-based access for suppliers to ...

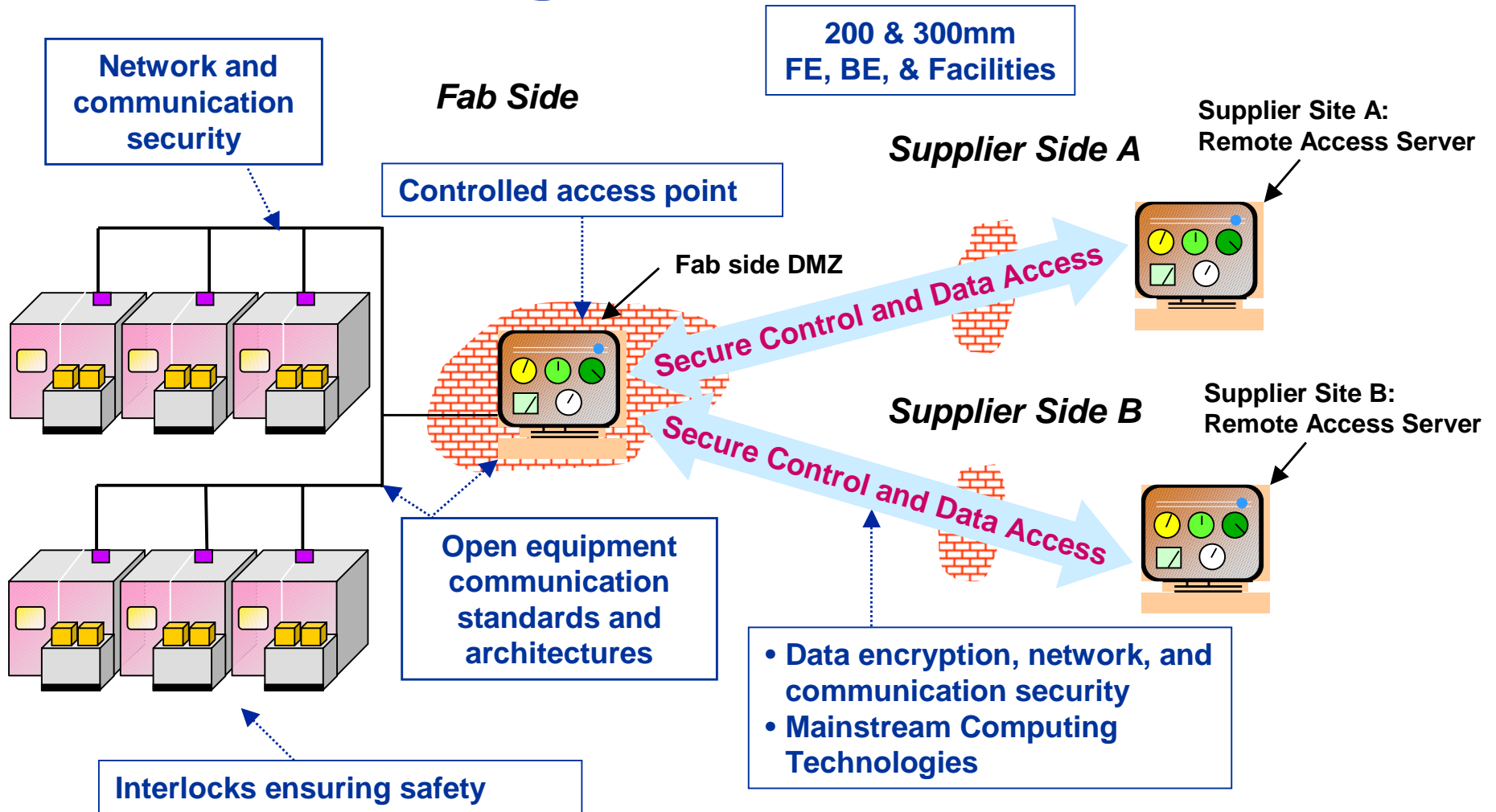
monitor equipment

provide improved uptime

optimize Predictive Maintenance

and reduce Mean-Time-To-Repair, Process Development

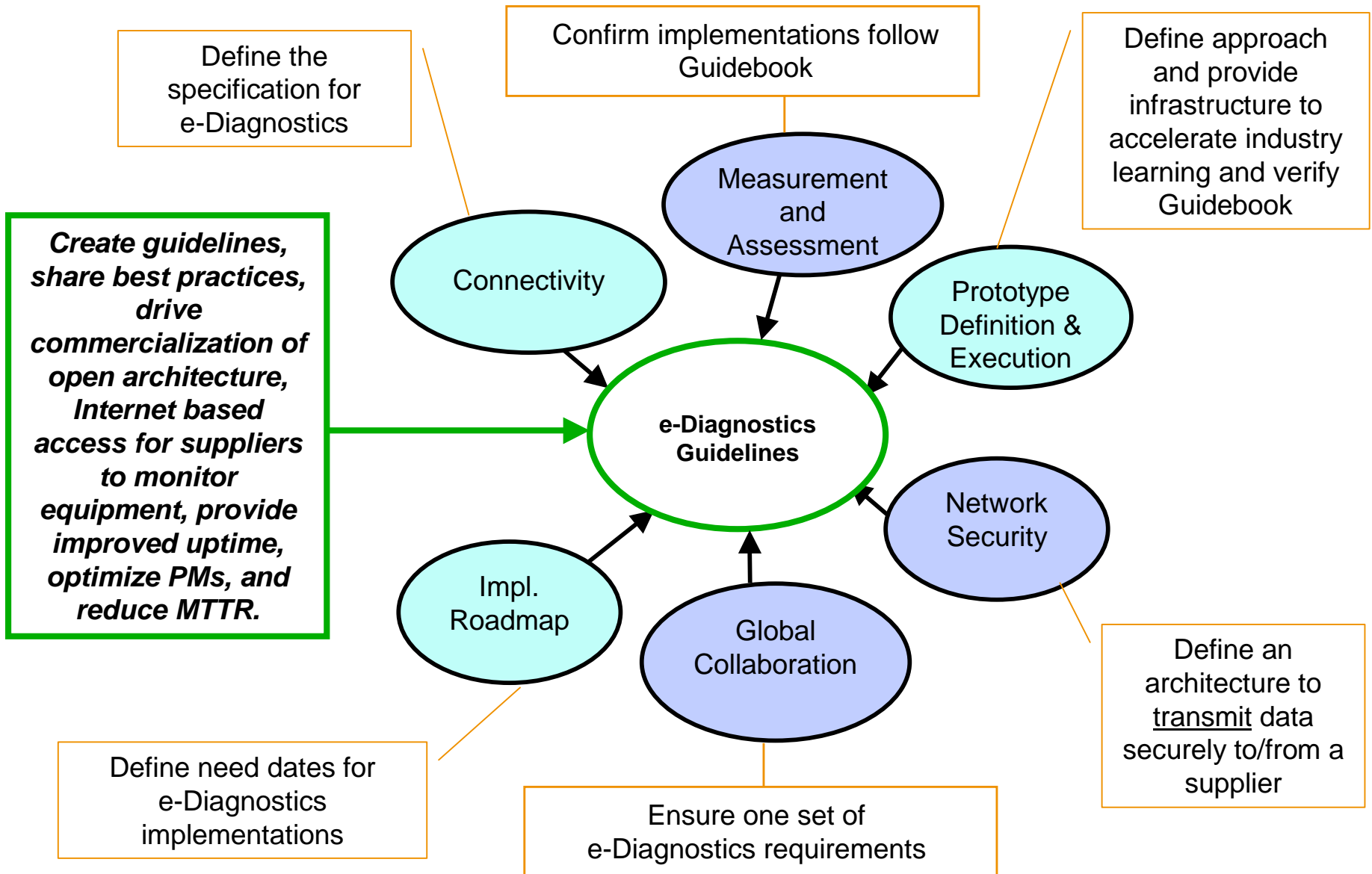
ISMT e-Diagnostic Guidelines



Full guideline document available at:

<http://www.sematech.org/public/resources/ediag/index.htm>

How do the New Teams fit?



ISMT e-Diagnostic Capability Definitions

Level 3 - Prediction:

Predictive Maintenance, Self Diagnostics, Automated Notification

Level 2 - Analysis:

Automated Reporting and Advanced Analysis with SPC capability

Level 1 - Collection and Control:

Remote Tool Operation, Remote Performance Monitoring, Remote Equipment Configuration

Level 0 - Access and Remote Collaboration:

Remote connectivity to the tool and remote collaboration capabilities (text, audio, video)

Full capability definition document available at:

<http://www.semtech.org/public/resources/ediag/index.htm>

e-Diagnostics: From Defacto Standard to SEMI Standard

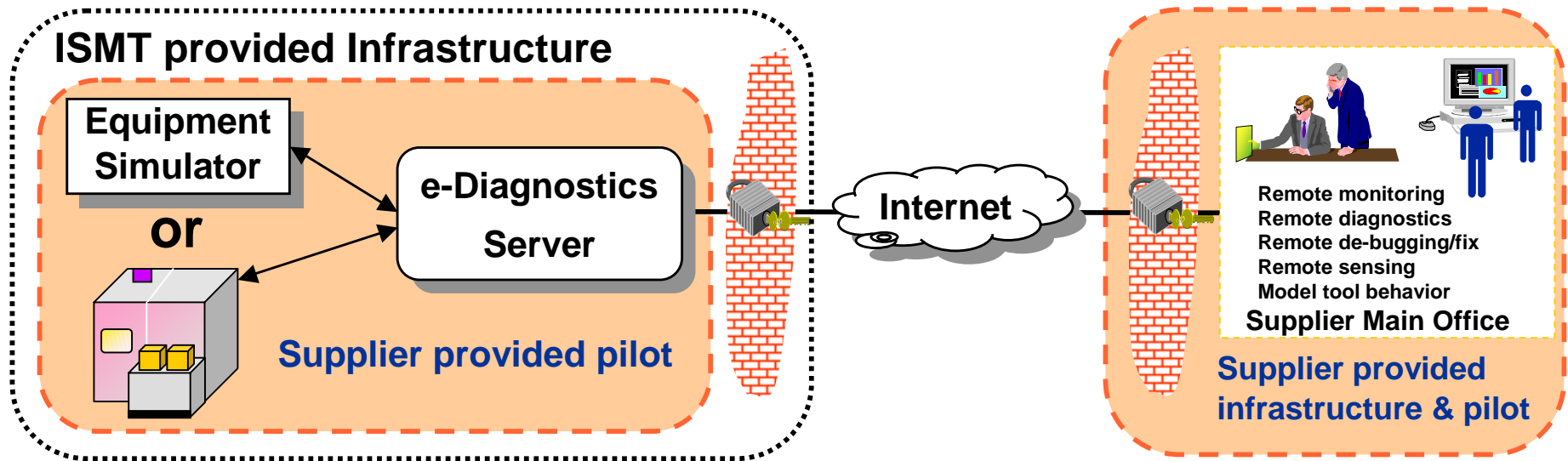
- **Transitioning into SEMI for equipment standards**
 - Gained SEMI NA Information & Control Committee approval to form e-Diagnostics standardization group (3/23)
 - Renamed Connectivity Team the SEMI Diagnostic Data Acquisition (DDA) Task Force
 - James Martin (Intel) is co-chair
 - First F2F held during SEMICON West (7/16), weekly teleconferences now
 - **Charter:** Provide data acquisition interface to semiconductor equipment supporting the diagnosis of equipment health issues

Guidelines accelerate standards creation

Implementation Roadmap

Equipment Type:		Etch	Litho/Track	Implant	Diffusion	Test	Metrology	Wets	CMP	Assembly / Facilities/ AMHS	IC Infrastructure
Priority:		a	a	b	b	c	c	d	d		a
LEVEL 0:											
	Remote connectivity:										
	Tool connectivity to interim server	Q3'01	Q3'01	Q3'01	Q3'02	Q3'01	Q3'01	Q3'01	Q3'01		Q3'01
	Interim server	Q1'02	Q1'02	Q1'02	Q4'02	Q1'02	Q1'02	Q1'02	Q1'02		Q1'02
	Remote collaboration	Q1'02	Q1'02	Q1'02	Q4'02	Q1'02	Q1'02	Q1'02	Q1'02		Q1'02
LEVEL 1:											
	Remote Performance Monitor	Q1'02	Q1'02	Q1'02	Q4'02	Q1'02	Q1'02	Q1'02	Q1'02		Q1'02
	Data collection/storage	Q1'02	Q1'02	Q1'02	Q4'02	Q1'02	Q1'02	Q1'02	Q1'02		Q1'02
	Remote tool control	Q3'02	TBD	Q3'02	Q1'03	Q3'02	Q3'02	Q3'02	Q3'02		TBD
LEVEL 2:											
	Automated Reporting (std & ad hoc)	Q1'02	Q1'02	Q1'02	Q4'02	Q1'02	Q1'02	Q1'02	Q1'02		Q1'02
	Advance Analysis w/SPC Cap	Q2'02	Q2'02	Q2'02	Q1'03	Q2'02	Q2'02	Q2'02	Q2'02		Q2'02
LEVEL 3:											
	Predictive maintenance/self-diagnosis:										
	On-tool analysis	Q4'02	Q4'02	Q4'02	Q1'03	Q4'02	Q4'02	Q4'02	Q4'02		TBD
	Tool data/supplier analysis	Q3'02	Q3'02	Q3'02	Q2'03	Q3'02	Q3'02	Q3'02	Q3'02		Q3'02
	MES/tool data - supplier analysis	Q4'02	Q4'02	Q4'02	Q3'03	Q4'02	Q4'02	Q4'02	Q4'02		Q4'02
	Automated notification	Q2'02	Q2'02	Q2'02	Q1'03	Q2'02	Q2'02	Q2'02	Q2'02		Q2'02

e-Diagnostics Prototype



★ ISMT Provides

- 👉 Network infrastructure, internal firewall, hosts pilot activities

★ Supplier Provides

- 👉 Equipment simulator or tool, e-Diagnostics pilot, remote pilot
- 👉 Must include OEM, but may also include 3rd party

★ e-Diagnostics Working Group provides

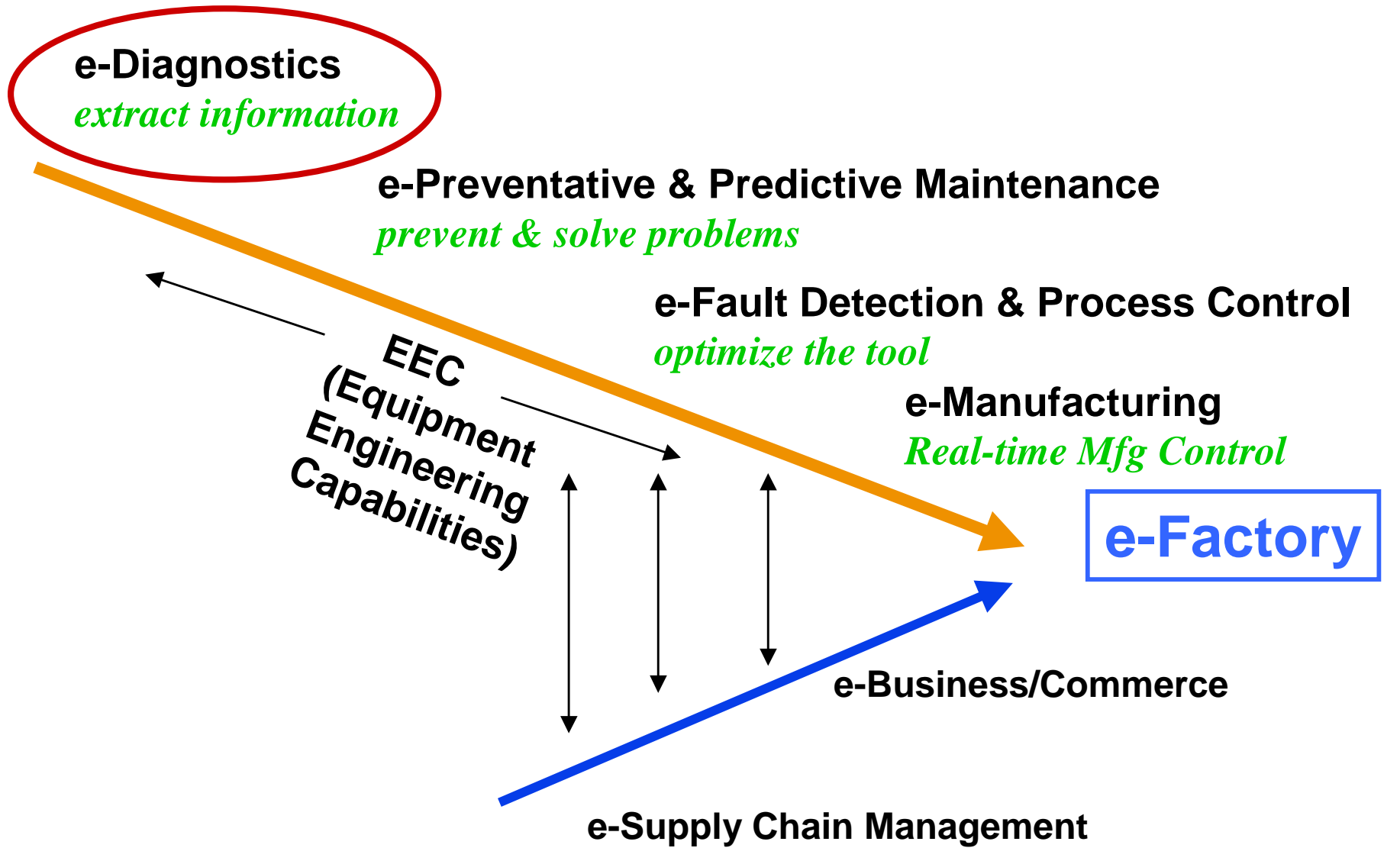
- 👉 Prototype (Guidebook) evaluation criteria, evaluation results

e-Diagnostics Deliverables

- Key Program Outputs

- ✓ Prototyping Request for Proposals 01/01
- ✓ Initiate SEMI standards activity 03/01
- ✓ LaJolla seminar, e-Diagnostics Guidebook update 03/01
- ✓ SEMICON Europa seminar 04/01
- ✓ Security Guide 06/01
- ✓ Measurement & Assessment Guide – Level 0 06/01
- SEMICON West seminar, EEC Guideline Rollout 07/01
- Begin ISMT hosted prototyping 08/01
- Measurement & Assessment Guide – Level 1 09/01
- Roadmap Revision 2 09/01
- DDA standard blue ballot 10/01
- Measurement & Assessment Guide – Level 2, 3 11/01
- DDA standard yellow ballot 12/01

Path to e-Factory - ISMT



EEC Collaborations

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)

Machine-to-Machine difference management

Maintenance scheduling, etc.

e-Diagnostics

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e-Diagnostics Summary

- **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
- **e-Diagnostics Guidelines are complete, they are now transitioning into a standard**
- **Moving into prototyping and implementation**
- **Suppliers and IC makers finalizing roadmap for standards and implementations**

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