

e-Diagnostics/e-Manufacturing Latest News

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

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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.

Internet

- Mainstream Computing Technologies
- Open Architectures

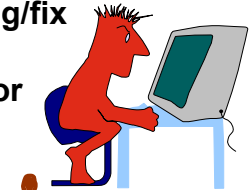
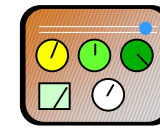
Protocol Options

- Serial line IP
- Remote Control
- Telnet
- Ethernet IP
- VPN

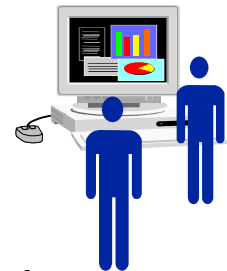
Firewall & Authentication

- Data Security
- Safety Infrastructure

Remote monitoring
Remote diagnostics
Remote de-bugging/fix
Remote sensing
Model tool behavior



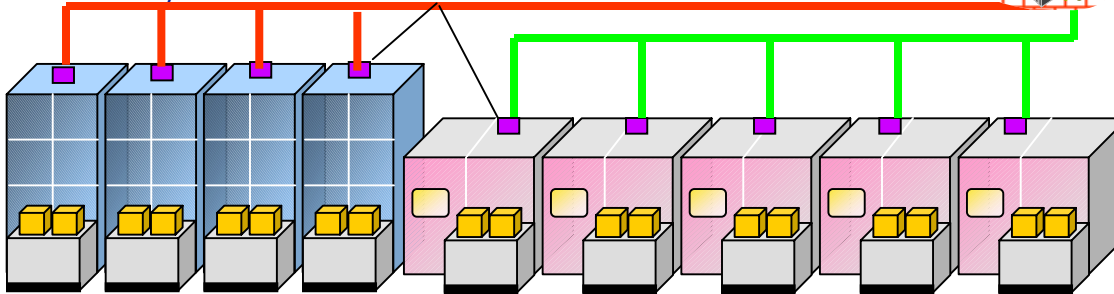
Supplier A Main Office



Remote monitoring
Remote diagnostics
Remote de-bugging/fix
Remote sensing
Model tool behavior
Supplier B Main Office

Factory floor

e-Diagnostic enabled Controllers



Equipment A

Equipment B

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), Field service access

Full capability definition document available at:

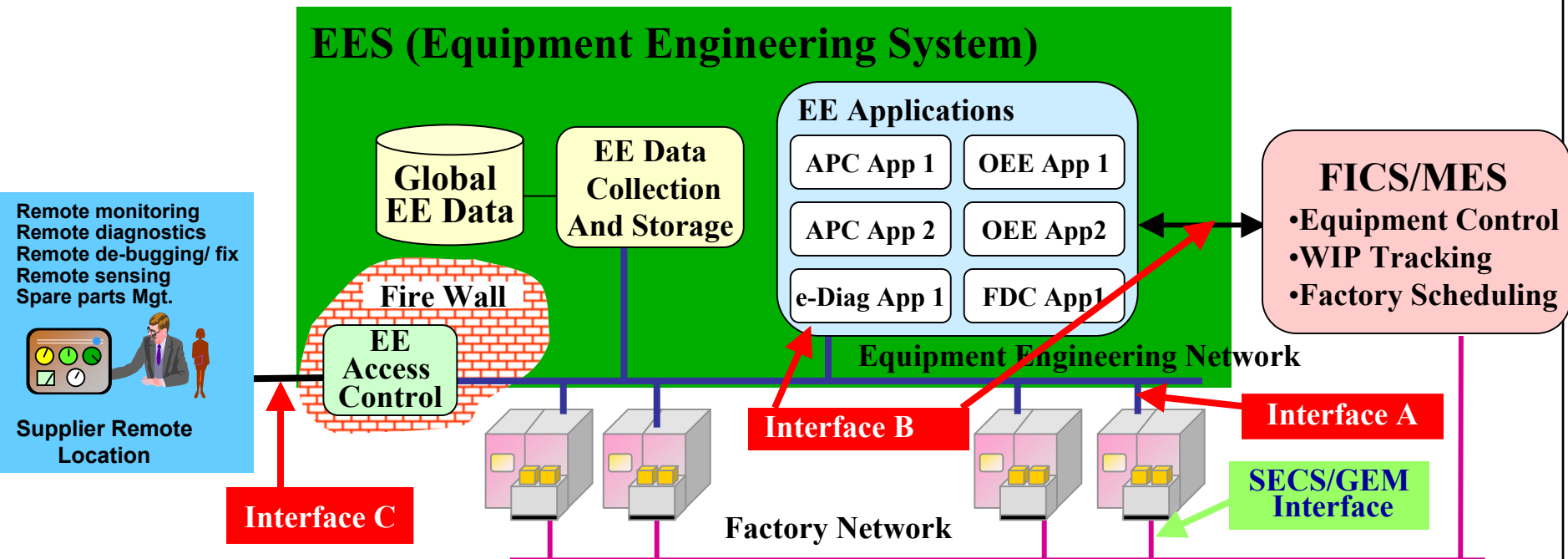
<http://www.semtech.org/public/resources/ediag/index.htm> (V1.3)

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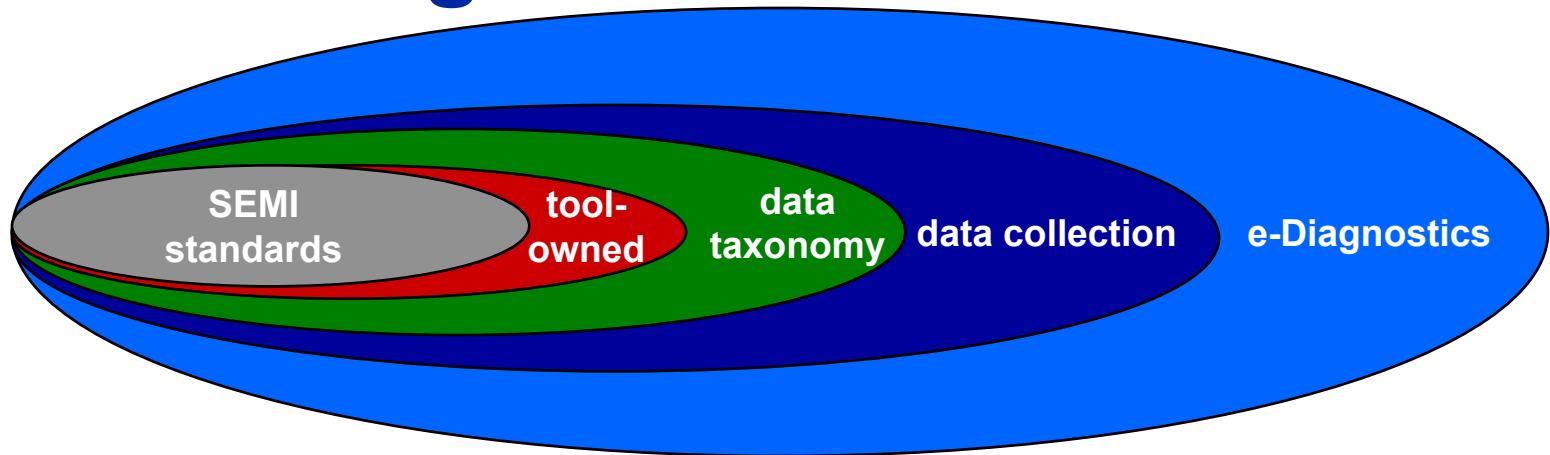
07/22/2002 hawle-mfg/roadshow/Europe e-diag 2002 - 3

2002 Focus: Improved Data

- **Interface A** – Equipment Engineering Data Interface
 - Getting more & better data from the equipment
- **Interface B** – Among EEC Applications and to FICS/MES
- **Interface C** - External Access to e-Diagnostics
- **SECS/GEM** – Still The Primary Equipment Control I/F



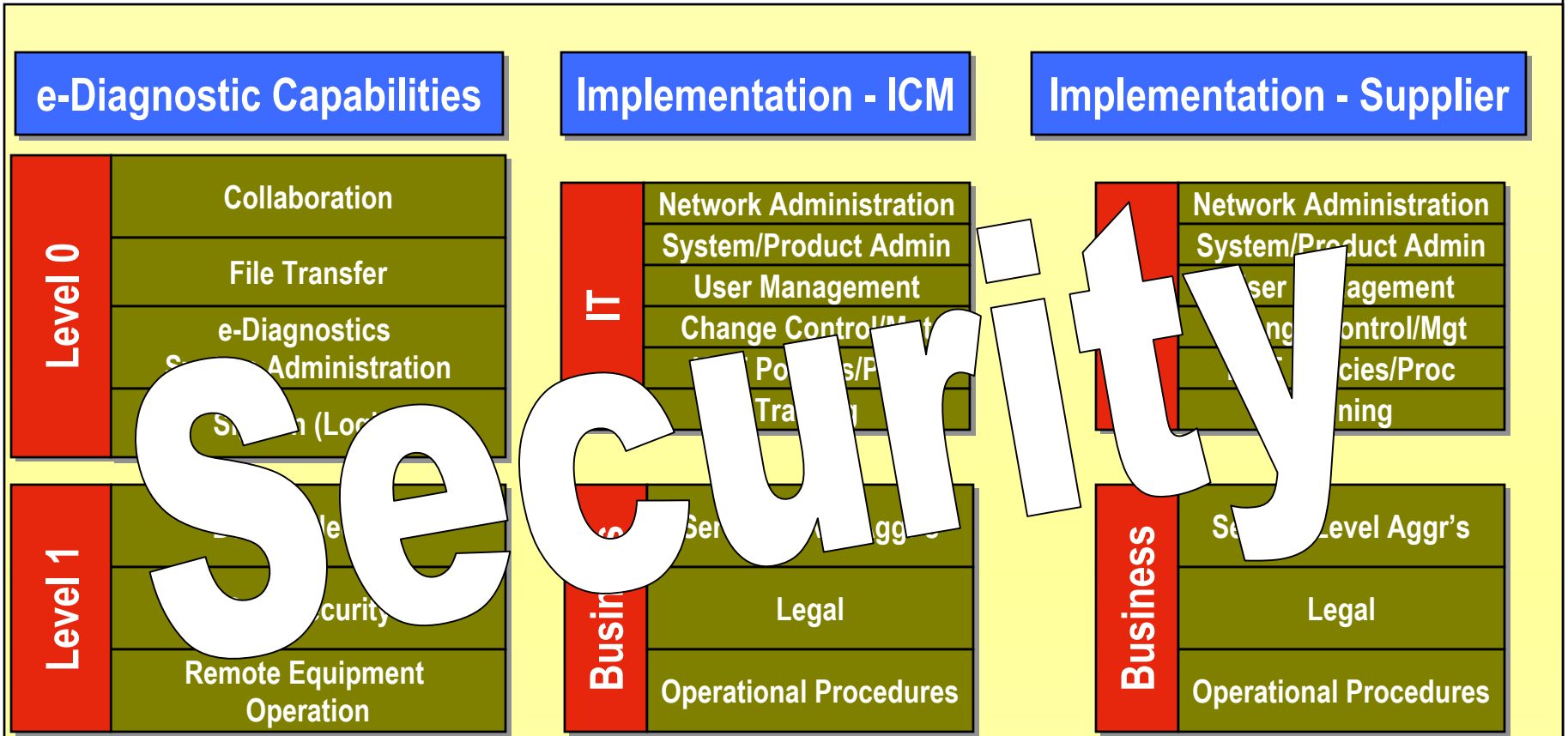
Standardizing Interface A



Diagnostics Data Acquisition (DDA) Task Force Ballots

- **Yellow (voting ballot)**
 - **3508: Guide for Equipment Data Acquisition (Interim Solution)**
- **Blue (informational ballot)**
 - **3507: Provisional Specification for Equipment Client Authentication and Authorization**
 - **3509: Provisional Specification for Data Collection Management**
 - **3510: Provisional Specification for Equipment Services Description**

Measurement & Assessment Checklist Structure



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

e-Diagnostics Checklist Details

Focus Area	Compliance Element Code	Required	Optional	Shared	Feature	Feature Description	Capability Description
Collaboration	TS-CL0.11		●		Voice transmission	Ability to provide Voice over IP between the ICM and Supplier during a collaboration session.	
	TS-CL0.10		●		Video transmission	Ability to provide streaming video between the ICM and Supplier during a collaboration session.	
	TS-CL0.9		●		Still image capture	Ability to exchange still images between ICM and Supplier during a collaboration session.	
	TS-CL0.8		●		Real-time white board drawing	Ability to provide basic "white board" capability between ICM and Supplier during a collaboration session.	
	TS-CL0.7		●		Real-time application sharing	Ability to share applications necessary for collaboration. Does not include remote administration or remote tool control applications covered in Capability Level 1.	
	TS-CL0.6		●		Customer Service Network Access	FSE has access to supplier resources from factory floor.	
	TS-CL0.5	●			Chat Capability	Ability to support multi user Text Chat sessions among all ICMaker and Supplier participants during a collaboration session.	
	TS-CL0.4	●			Confferencing	If conferencing is available, the eDiagnostic system must provide the mechanisms to ensure that only authorized personnel have access into the secure conference.	
	TS-CL0.3	●			Technologies	The Collaboration technologies used must be agreed upon between IC Maker and supplier. This includes Data, Voice, and Video.	
	TS-CL0.2				Open Architecture	e-Diagnostics solutions must be implemented using an open architecture, based on mainstream computer technologies, non-proprietary standards, and data models.	
				Use of TCP/IP	Communication must take place over standard communication connections using TCP/IP protocols.		

Compliance Element Code

Capability

Feature Requirement

Focus Area

Collaboration

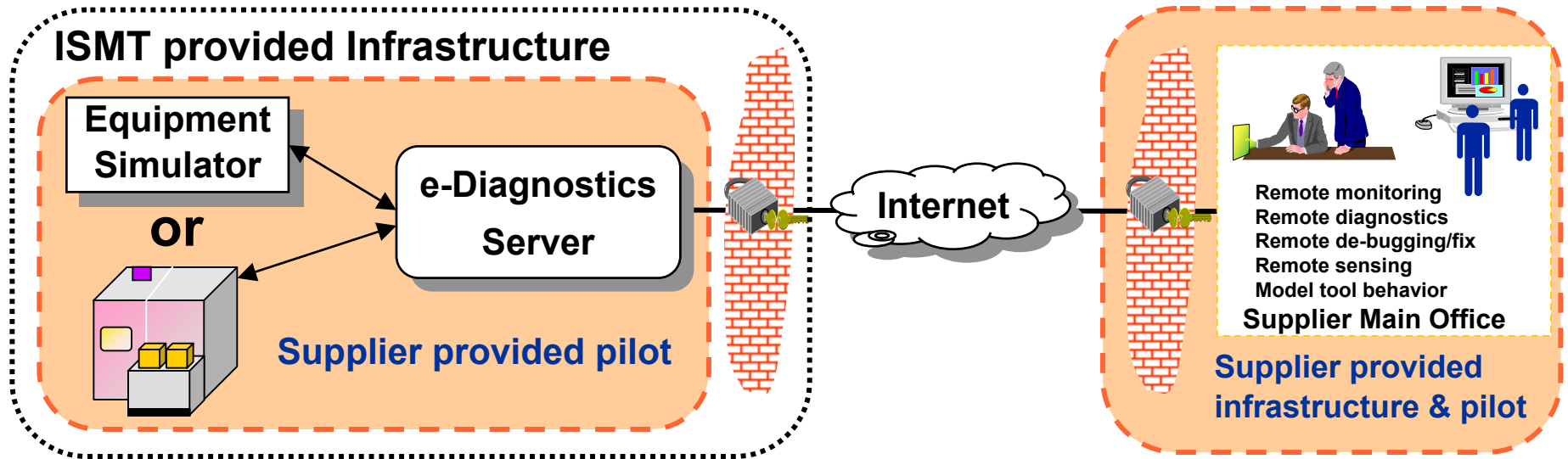
Capability Description

Feature Description

Assessment Checklist Lessons Learned

- **Checklists available now – 116 entries**
 - Level 0 – 25 entries
 - Level 1 – 27 entries
 - ICM – 30 entries
 - OEM – 34 entries
- **Next steps**
 - Level 2 available August 2002
 - Level 3 available September 2002
- **Usage experiences suggested**
 - Increasing granularity
 - More specifics
 - More comprehensive

e-Diagnostics Prototyping



★ 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

Prototyping Proposal Status

1. e-Diagnostics prototyping opportunity available at ISMT

- Complete solutions not expected
- Infrastructure available
- Confirm Guidebook integrity
- Accelerate industry learning
- Leveraging Assessment Checklist during prototypes

2. EDA Port prototyping opportunity available at ISMT

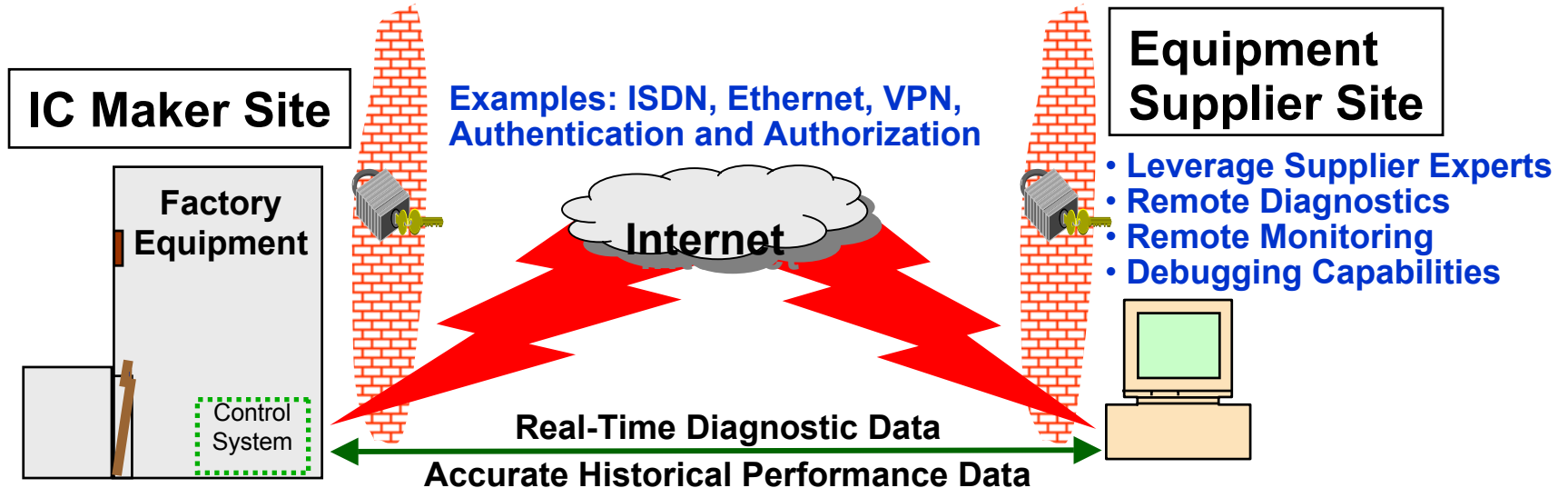
- Confirm integrity and completeness of SEMI 3508 Guide
- Understand implications of separating control and data
- Understand performance: XML/SOAP/HTTP, trace data collection, bottlenecks, etc.

Come one - Come all

e-Diagnostics Status

ISMT e-Diagnostic Very Active Working Group

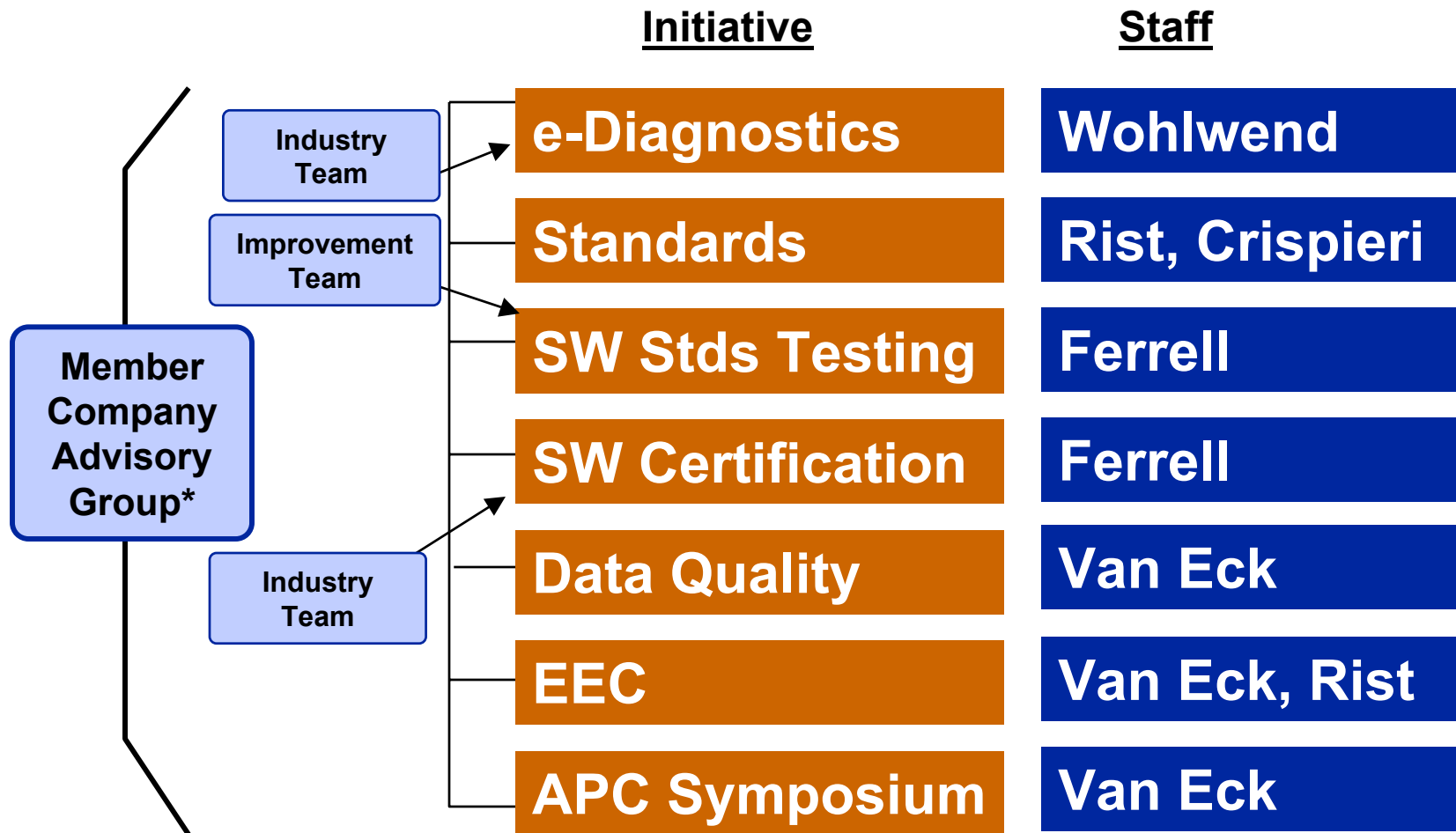
- Weekly active working groups: Diagnostics Data Acquisition (DDA) Task Force, Security, Safety, Measurement & Assessment, Data Taxonomy, Selete/JEITA Collaboration
- Weekly operations review teleconferences ongoing
- Includes MCs and ~80 suppliers (equipment + software)
- Prototyping at ISMT
- Building industry consensus: workshops, publications, teleconferences
- Deliverables: Guidebook, SEMI standards, Security & Safety learnings, Assessment checklists (4 of 6), New technology evaluations, ...



e-Diagnostics Key Messages

- 1. 300mm standards implementations remains the highest priority**
- 2. Leading OEMs are deploying e-Diagnostics solutions (100s of tools) and reporting significant benefit**
- 3. Interface A (data off the equipment) is the ISMT MC focus - standardized, open, & with accurate data**
- 4. Prototype solutions at ISMT, including Interface A**
- 5. ISMT MCs are cooperating with suppliers early to assure mutual success**

ISMT e-Manufacturing Program



* General e-Manufacturing oversight providing resources to guide and direct teams

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