"Interoperability of interoperability standards"

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The FIATECH Consortium

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FIATECH BRINGING THE BENEFITS OF TECHNOLOGY TO CAPITAL PROJECTS
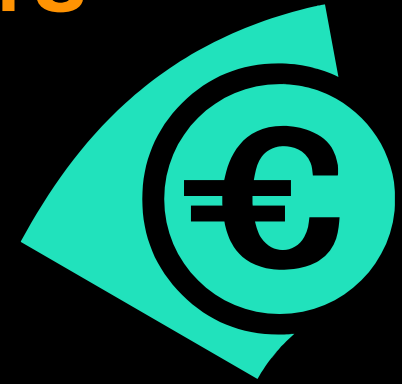
Global Market Factors

- Oil & gas industry will lose 60% of its employees by 2010

- 90% of engineering, procurement, construction (EPC) project work is performed outside the USA and growing

- The East graduates many more engineers than Western universities (India 4:1 & China 8:1)

Global teaming is a __must__ to complete our work

More Global Market Factors

- $100 billion spent on gas projects in North Africa and Middle East in 2005

- In 2006, Russia was the second highest spender on construction projects

- Petrochemicals and pharmaceuticals continue to grow in Middle East & China

Even More Market Factors

- 50% of EPCs lost money in 2004 & 2005 on upstream offshore projects due to poor bidding

- New projects getting very large ($5-$10 billion), more complex and owners more demanding

- Time to market and completing a project on time is more important than project cost

Owners Want

- Better integration between conceptual design, engineering and operations
- Maximized value from engineering data and minimized re-entry of information
- Validated and accurate information from AECs/EPCs
- Better management of engineering and business process changes
- Analyzed data information to support future projects
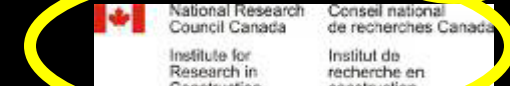- Improved connection and integration with the whole enterprise

EPCs Want

- Streamlined support for distributed execution
- Technology to support parallel execution and schedule compression
- Improved design reuse and leveraged design knowledge
- Improved internal integration with suppliers and subcontractors
- Reduced risk by applying better engineering quality controls and change management
- Improved performance and progress measurement
- Improved ability to meet handover requirements

FIATECH

..but first a word about FIATECH…

FIATECH is a Consortium…

FIATECH At a Glance

- **Industry-led Consortium**
  - Approx. 70 owners, contractors, suppliers, research organizations, universities
  - Formed in 2000, part of the College of Engineering at the University of Texas in Austin

- **Mission**
  - Provide global leadership in identifying and accelerating the development, demonstration and deployment of fully integrated and automated technologies to deliver the highest business value throughout the life cycle of all types of capital projects.

- **Guide: Capital Projects Technology Roadmap**
  - Industry-wide, global research agenda (not just FIATECH)

- **Mechanism: Implementation projects**
  - 35+ delivered products

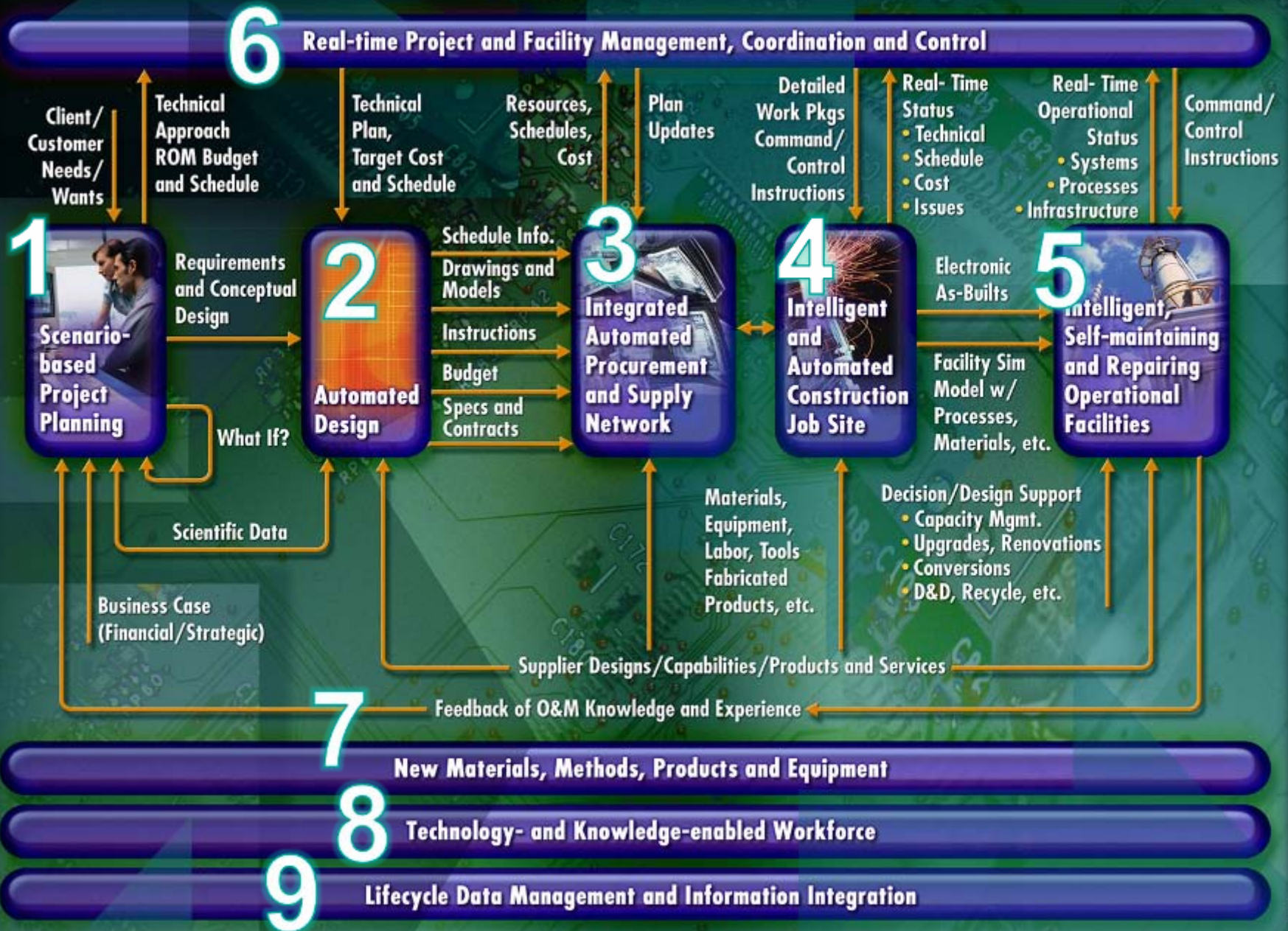# FIATECH Technology Roadmap Provides Way To…

- **Leverage scarce resources**
- **Work Together**
  - Private Industry
  - Associations & Organizations
  - Universities
  - Research Centers & Labs
  - Government
  - Technology Developers & Equipment Suppliers
- **Reduce**
  - Fragmentation
  - Wasteful overlap and competition
- **Orchestrate and leverage international initiatives**

FIATECH's Vision of an Integrated and Automated Capital Projects Industry

6 — Real-time Project and Facility Management, Coordination and Control

1 — Scenario-based Project Planning

2 — Automated Design

3 — Integrated Automated Procurement and Supply Network

4 — Intelligent and Automated Construction Job Site

5 — Intelligent, Self-maintaining and Repairing Operational Facilities

7 — New Materials, Methods, Products and Equipment

8 — Technology- and Knowledge-enabled Workforce

9 — Lifecycle Data Management and Information Integration

Client/Customer Needs/Wants

Technical Approach ROM Budget and Schedule

Technical Plan, Target Cost and Schedule

Resources, Schedules, Cost

Plan Updates

Detailed Work Pkgs Command/Control Instructions

Real-Time Status
• Technical
• Schedule
• Cost
• Issues

Real-Time Operational Status
• Systems
• Processes
• Infrastructure

Command/Control Instructions

Requirements and Conceptual Design

Schedule Info.

Drawings and Models

Instructions

Budget

Specs and Contracts

What If?

Electronic As-Builts

Facility Sim Model w/ Processes, Materials, etc.

Scientific Data

Business Case (Financial/Strategic)

Materials, Equipment, Labor, Tools Fabricated Products, etc.

Decision/Design Support
• Capacity Mgmt.
• Upgrades, Renovations
• Conversions
• D&D, Recycle, etc.

Supplier Designs/Capabilities/Products and Services

Feedback of O&M Knowledge and Experience

Fully integrated and highly automated project processes coupled with radically advanced technologies across all phases and functions of the project/facility lifecycle

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Current FIATECH Projects

- Capital Projects Technology Roadmap
- Automated Design Workflow Mapping and Checklists
- Global Valve Cross-Reference e-Catalog
- Automating Equipment Information Exchange
- Smart Chips
- Leveraging Technology to Improve Construction Productivity
- Operational Facility Roadmap Directory
- Streamlining Building and Land Use Regulatory Processes
- Adoption of Mobile IT
- Attracting the Next Generation
- Teaching Core Technology Competencies
- **Accelerating Deployment of ISO 15926**

How Are We Doing?

- Identify the most appropriate standard for the industry. ✓

- Find ways to accelerate its development and deployment. ✓

- Do it and use it

What do we need to do?

- Simple Unified Plan

- Clarity of Message
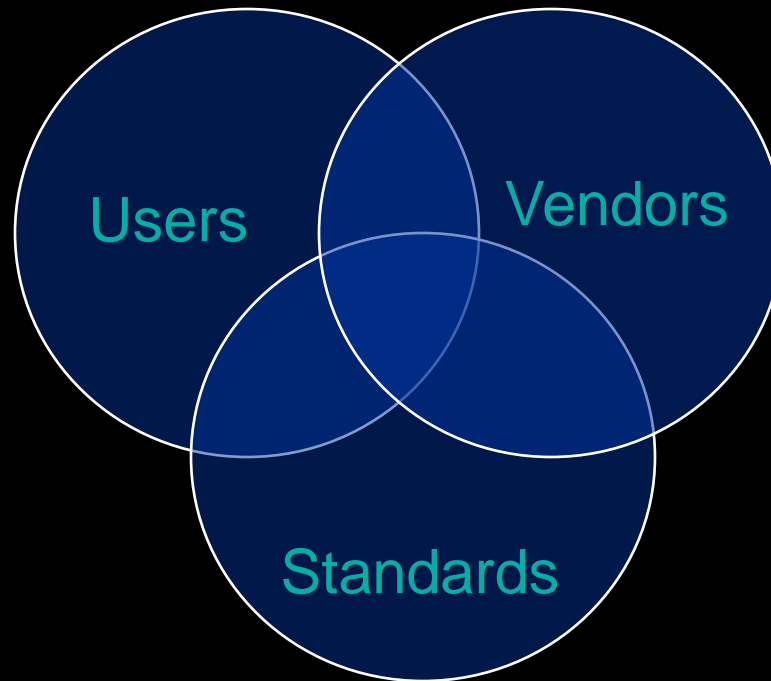
- Closer Technical Co-ordination and Co-operation

FIATECH's plans…

- ISO 15926 delivery by end 2010
- New funding will be available to make this happen
- Plan to achieve this to be developed by end Oct 2009
- Renewed, higher level co-ordination with PCA

Co-operation is VITAL!
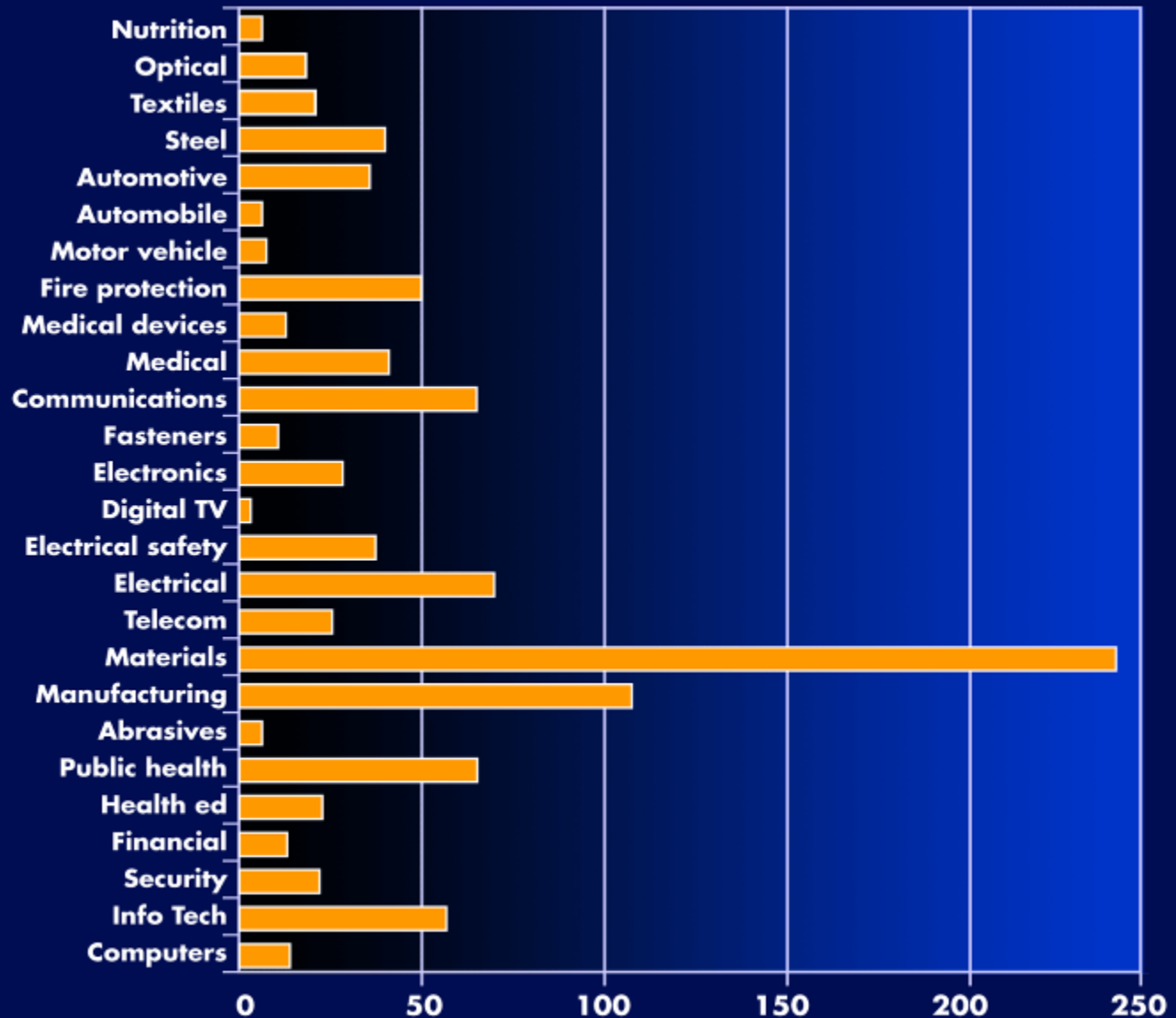
Interoperability

Co-operation is VITAL!

Let's talk about Interoperability, Interoperation, and Standards.

So, what standard is right for you?

"So many standards, so little time."
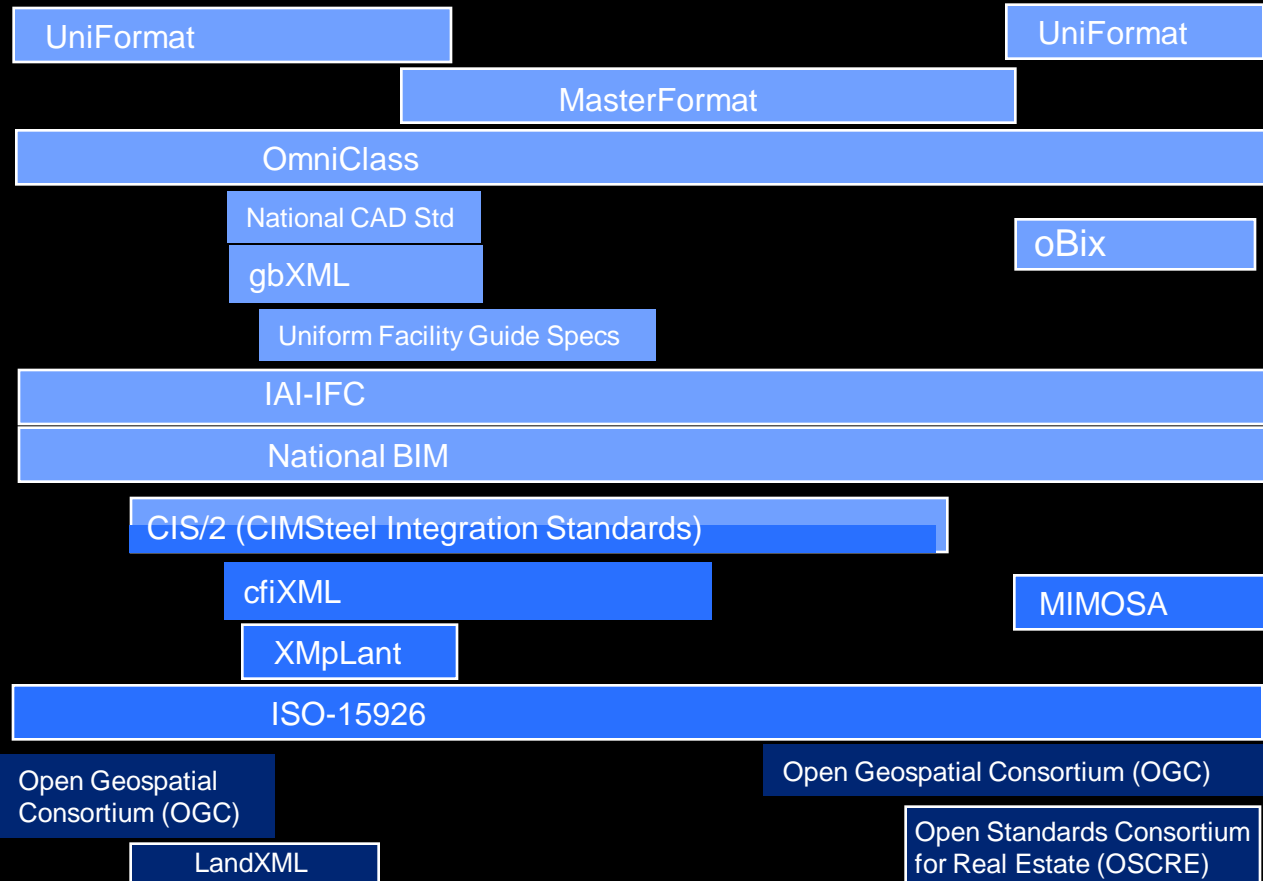
Current Standards Landscape

Roadmap Element

| Scenario-based Project Planning | Automated Design | Integrated Automated Procurement and Supply Network | Intelligent and Automated Construction Job Site | Intelligent, Self-maintaining and Repairing Operational Facilities |

Information Standards

Commercial & Institutional Buildings

- UniFormat
- UniFormat
- MasterFormat
- OmniClass
- National CAD Std
- oBix
- gbXML
- Uniform Facility Guide Specs
- IAI-IFC
- National BIM

Industrial Process Facilities

- CIS/2 (CIMSteel Integration Standards)
- cfiXML
- MIMOSA
- XMpLant
- ISO-15926

Geospatial and Infrastructure

- Open Geospatial Consortium (OGC)
- Open Geospatial Consortium (OGC)
- LandXML
- Open Standards Consortium for Real Estate (OSCRE)

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Standards Activities in the C&B Industry

Closer Look at Standards Activities

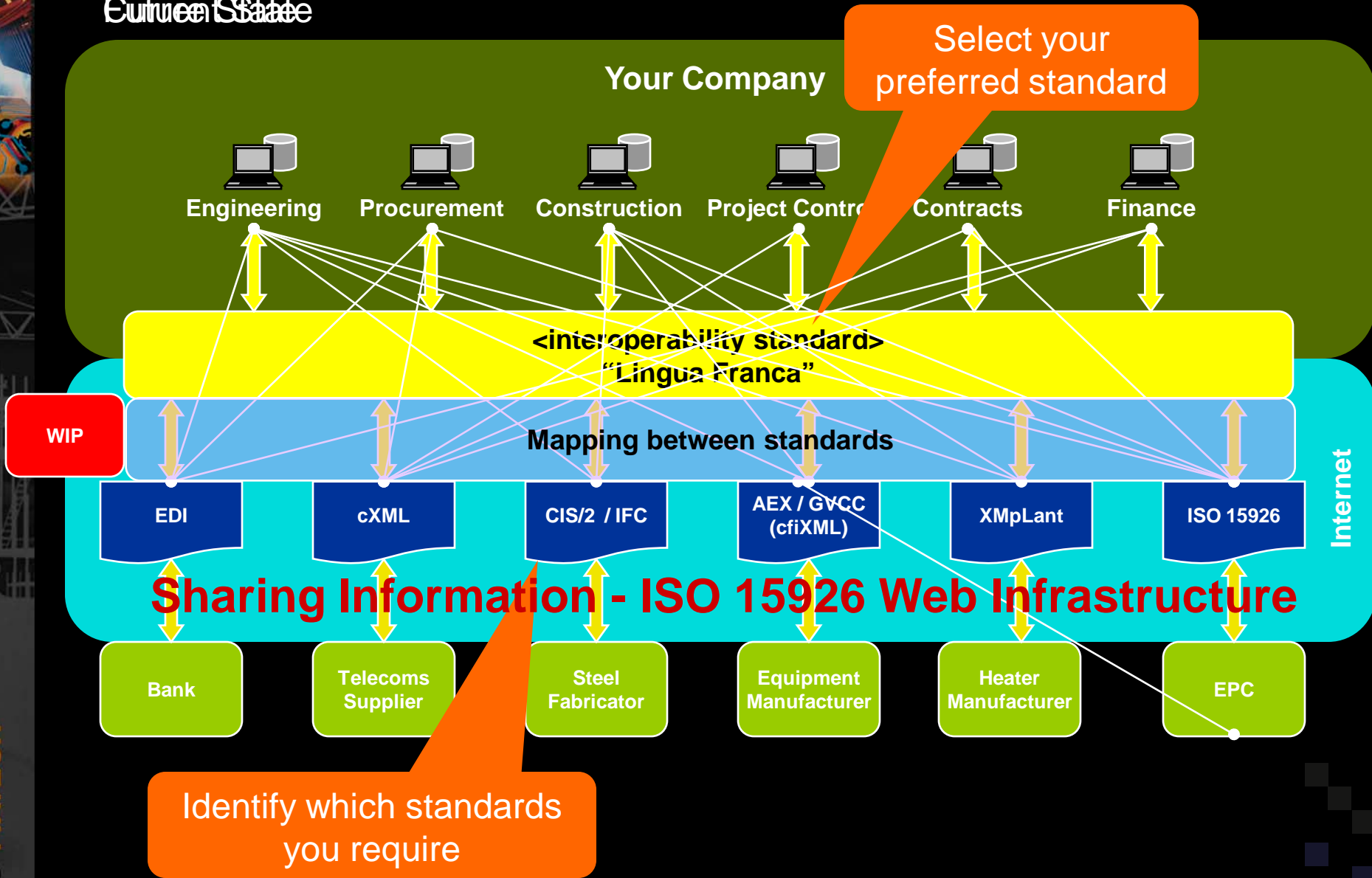| Name	Description	Name	Description
gbXML	green buildings XML (affiliated with aecXML	MatML	XML for construction materi...
aecXML	Architecture engineeri... and co...truct... XML		...ML ...ru...d...g...m gu... ...o...e
		...S	NBS –Operations Maintenance and Support Information
		ProcessML	XML to support Euro...an da... warehouse ...andar...
CIDX	Chemical industry XML		...X...ces... ...t... ...a... ...e
CIMIS	Con... ...t		...ica...ro...r...ML (...PR)
	...ML	ThermoML	Thermodyamic XML
	...dustry Foundation Classes - a conceptual framework for holding building information	UnitsML	XML for units of measurement
ISA	Instrumentation Systems and Automation Society (datasheets)	XMpLant	XML for ISO 15926 Dictionary compliance

Are we doing the right things?

Are we doing things right?

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Yes…and…Yes

- Right things
  - XML
  - HTML
  - Wikipedia
- Things right
  - Communities of practice
  - Agreeing on information to be exchanged
  - Agreeing on standard
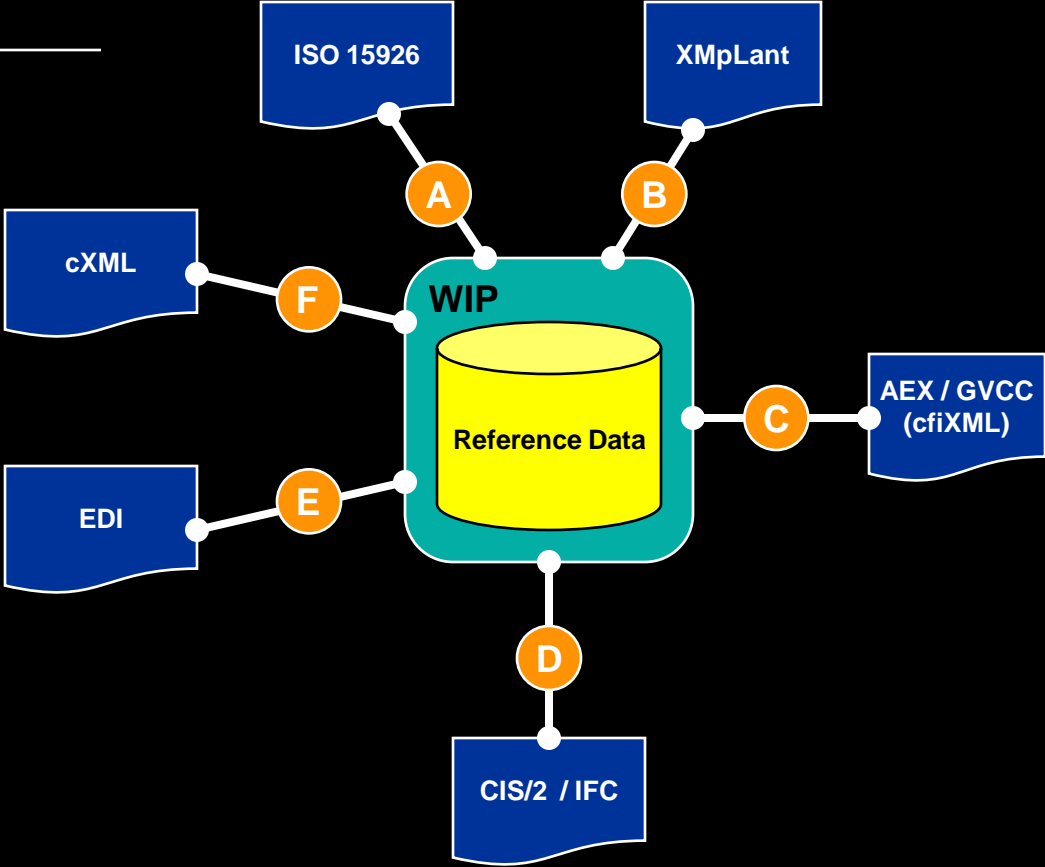
Taming of the Standards

Future State

Your Company

Engineering Procurement Construction Project Control Contracts Finance

<interoperability standard>
"Lingua Franca"

WIP

Mapping between standards

| EDI | cXML | CIS/2 / IFC | AEX / GVCC (cfiXML) | XMpLant | ISO 15926 |

Sharing Information - ISO 15926 Web Infrastructure

| Bank | Telecoms Supplier | Steel Fabricator | Equipment Manufacturer | Heater Manufacturer | EPC |

Internet

Select your preferred standard

Identify which standards you require

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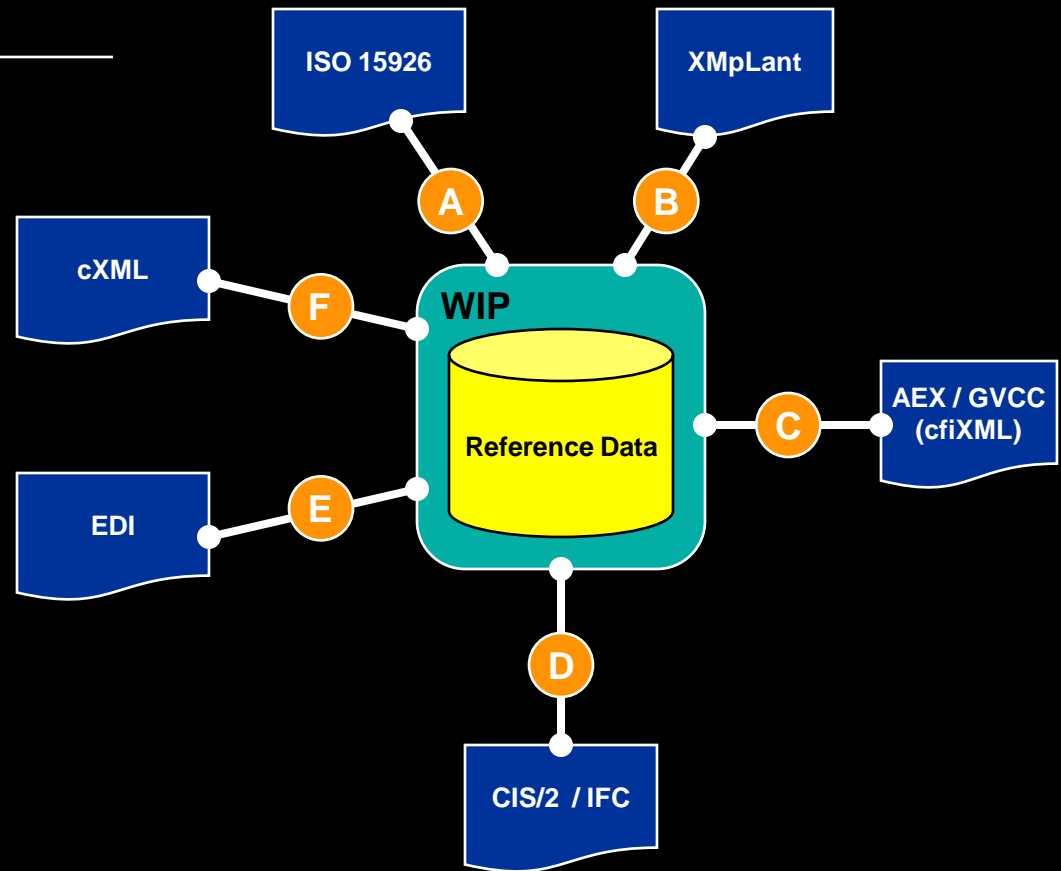# Standards Harmonization

Sponsoring Organizations

A (Native to ISO 15926)

B Noumenon / POSC Caesar

C FIATECH / POSC Caesar / PIP

D FIATECH / POSC Caesar / PIP

E FIATECH / MIMOSA / POSC Caesar / BuildingSMART

F Bechtel / POSC Caesar

G Bechtel / POSC Caesar

ISO 15926

XMpLant

cXML

WIP

Reference Data

AEX / GVCC (cfiXML)

EDI

CIS/2 / IFC

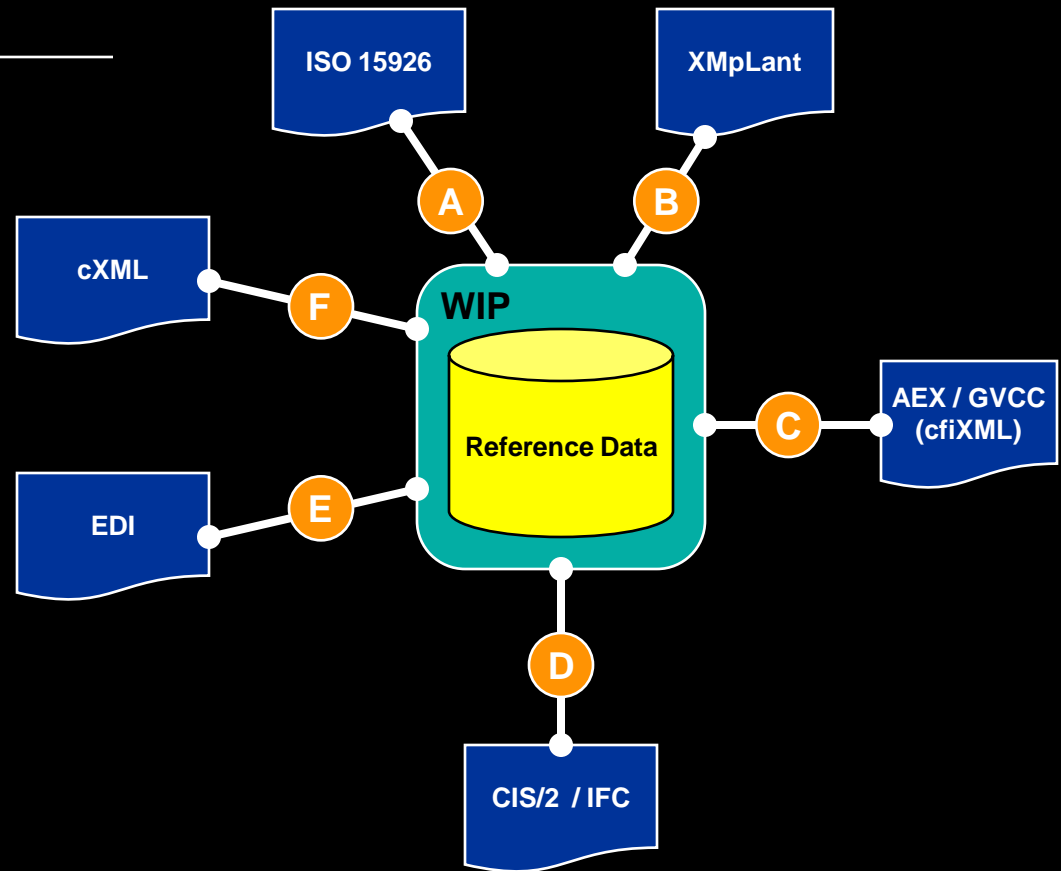# Standards ~~Harmonization~~

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Standards Interoperation

Sponsoring Organizations

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The Bottom Line

- It's time for standards groups to begin working across their silos
- It's time to change the operative word from "harmonization" to "interoperation"
- It's time to open up all these activities to mass collaboration tools
- It's time for every customer to demand this
- It's time for every s/w developer to provide it
- It's time to fix this problem

FIATECH Interoperability Strategy

- Align FIATECH projects

- Extend ISO15926 and AEX to power plants (EPRI)

- Bring in permitting and regulatory (Bob Wible)

- Connect with National BIM Standard (IFCs)

- Connect with operations (MIMOSA, COBIE)

- Connect with geospatial (OGC)

- Connect with real estate (OSCRE)

- …

Thus achieving interoperability
of
Interoperability standards

Thank you