Life-cycle Interoperability for Critical Infrastructure Management

Leveraging MIMOSA, OpenO&M and ISO 15926

June 7, 2011

PCA Forum and Member Meeting

Oslo, Norway

Alan Johnston
OpenO&M Initiative Chair
MIMOSA President

Context for Collaboration

The Safe Technology Roadmap™ for Interoperability

Semantic Context

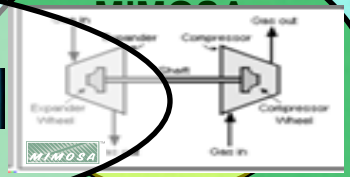
Reference Information Environment

Execution Environment "P2B Stack"

Enterprise Business Systems

Transform Engine

Information Service Bus



Controls

Registry

Physical Assets

MIMOSA™ FIATECH CIEAM POSC Caesar Association The OpenO&M Initiative

Critical Infrastructure

14 Sectors Indentified by US Government – Shared Problems & Solutions

- Agriculture and Food – Departments of Agriculture and Health and Human Services
- Water – Environmental Protection Agency
- Public Health – Department of Health and Human Services
- Emergency Services – Department of Homeland Security
- Government – Department of Homeland Security
- **Defense Industrial Base – Department of Defense**
- Information and Telecommunications – Department of Commerce
- **Energy – Department of Energy**
- **Transportation and Shipping – Department of Transportation**
- Banking and Finance – Department of the Treasury
- **Chemical Industry and Hazardous Materials – Department of Homeland Security**
- Post – Department of Homeland Security
- National Monuments and icons - Department of the Interior
- **Critical Manufacturing - Department of Homeland Security**

OpenO&M Objective - A Significant Paradigm Shift

- A new industry solutions business model where systems of systems interoperate based on open, supplier neutral standards
  - ✓ OpenO&M Initiative - A focus on the Execution Environment – All O&M systems
  - ✓ Shared, supplier neutral industry information models
  - ✓ Shared, supplier neutral industry utility services (SOA-2) driven by industry use cases
  - ✓ Green Field - O&M systems populated during EPC phase through handover
  - ✓ Brown Field – O&M interoperability model does not require rip and replace, leverages existing systems and data using OpenO&M Specifications , web services and adaptors
- Trusted public/private organization provide third-party certification and identification
- Owner/Operator Leadership and Governance

CIEAM Cooperative Research Centre for Infrastructure and Engineering Asset Management

CRC Centric Login

HOME | ABOUT US | NEWS | PARTICIPANTS | EVENTS | CONTACT US

ASSET INNOVATION ON THE MOVE

The cost of maintaining Australia's infrastructure, non-residential buildings and industrial facilities is estimated at $30 billion per year.

CIEAM is working directly with leading industry, government and research organisations to develop and implement innovative solutions, creating significant reductions in the costs of asset-ownership and optimising asset management systems in Australia.

CIEAM LATEST

WELCOME TO CIEAM'S NEW WEBSITE

You've arrived at the new online home of CIEAM, the Cooperative Research Centre for Infrastructure and Engineering Asset Management.

In December 2009, the Minister for Innovation, Industry, Science and Research announced that CIEAM was successful in the twelfth round of CRC funding, enabling the centre to build on six years research, with a renewed drive to provide genuine solutions to real-life industry challenges

The new incarnation of CIEAM has prompted a fresh, new brand identity, with an updated a new website to match. We're rolling out the new site in two stages, the first of which you see here and which showcases

NEWS FEED

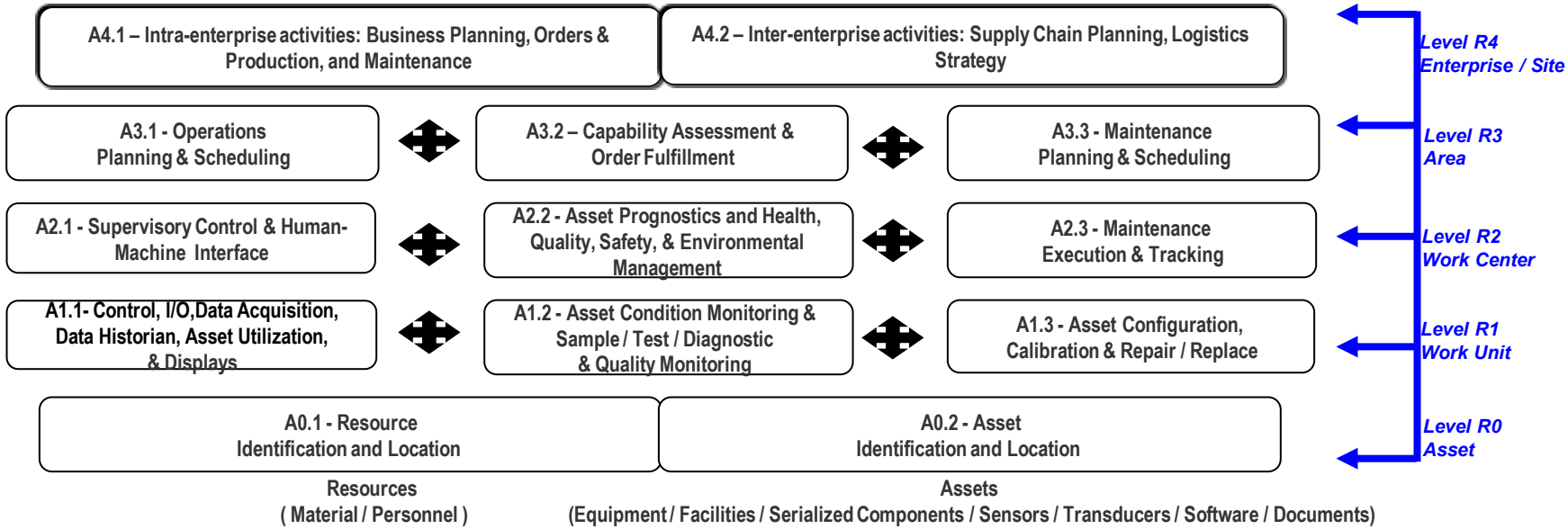
- **WATER REPORT EARNS STUDENT AWARD**
  Mon, 04 Apr 2011 04:57:16 GMT
  USQ postgraduate student Benjamin Taylor was recently awarded the 2010 Nation...
- **GENERAL PHYSICS INTEGRATES ADVANCED PATTERN RECOGNITION TECHNOLOGY INTO ETAPRO PLANT PERFORMANCE MONITORING**

Internet | Protected Mode: On 100%

MIMOSA™ The OpenO&M Initiative

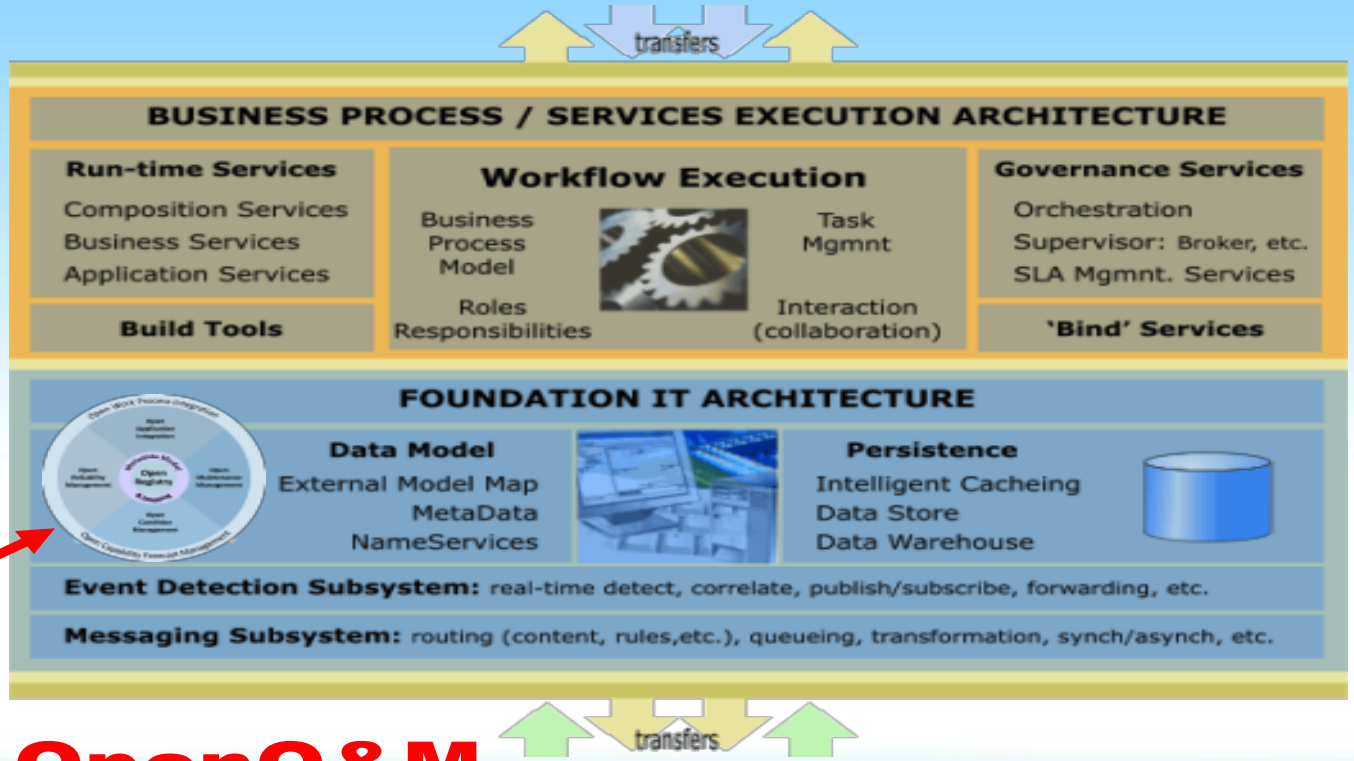
ISO 18435 - 1
Application Domain Integration Diagram

Application Domain Integration Diagram



the openO&M™ initiative

strategic fit

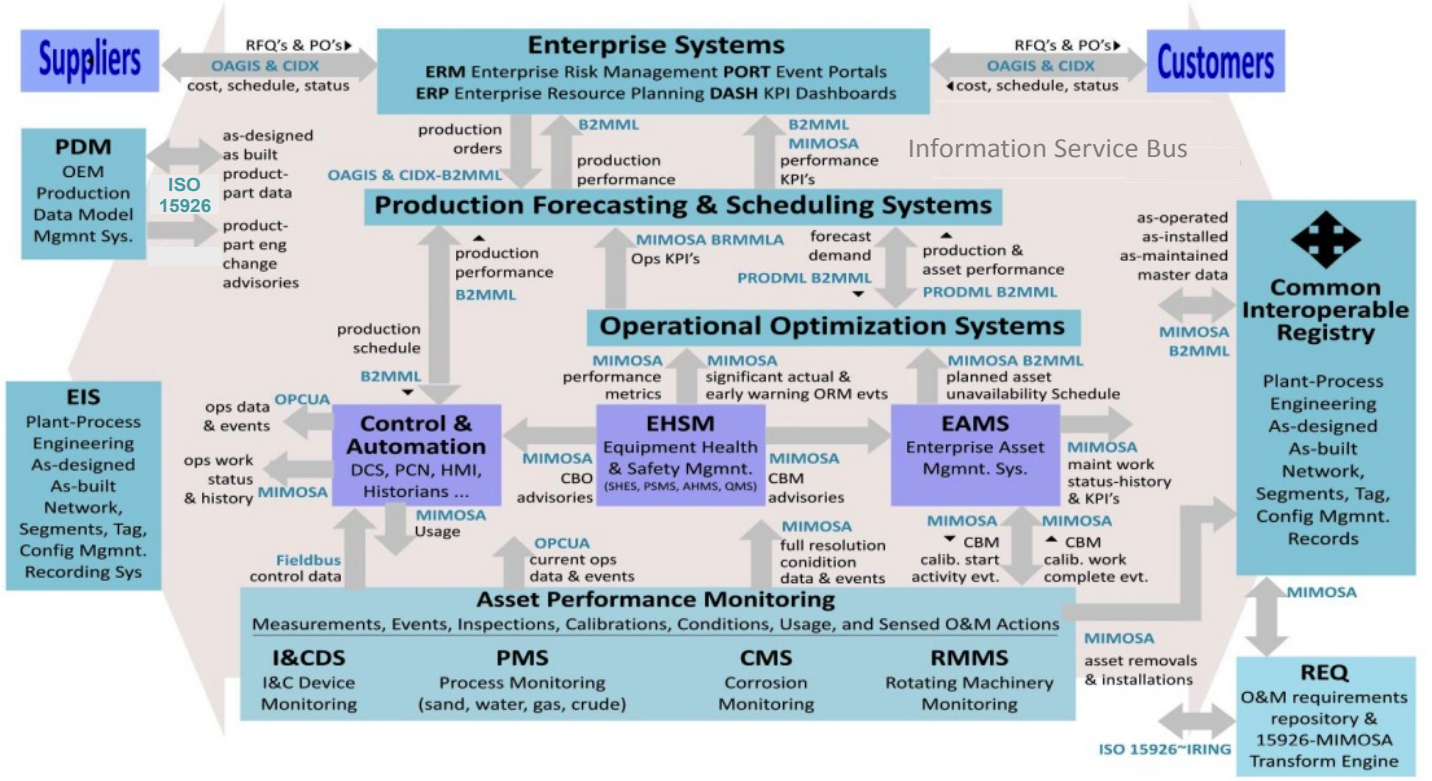


2

1

OpenO&M

Oil & Gas Use Cases



Prime Objective:
Sustainable Interoperability for People, Processes and Systems in the P2B stack

Methodology
OpenO&M Use Cases are developed with the owner/operator community with a focus on practical, experience-based functional requirements.

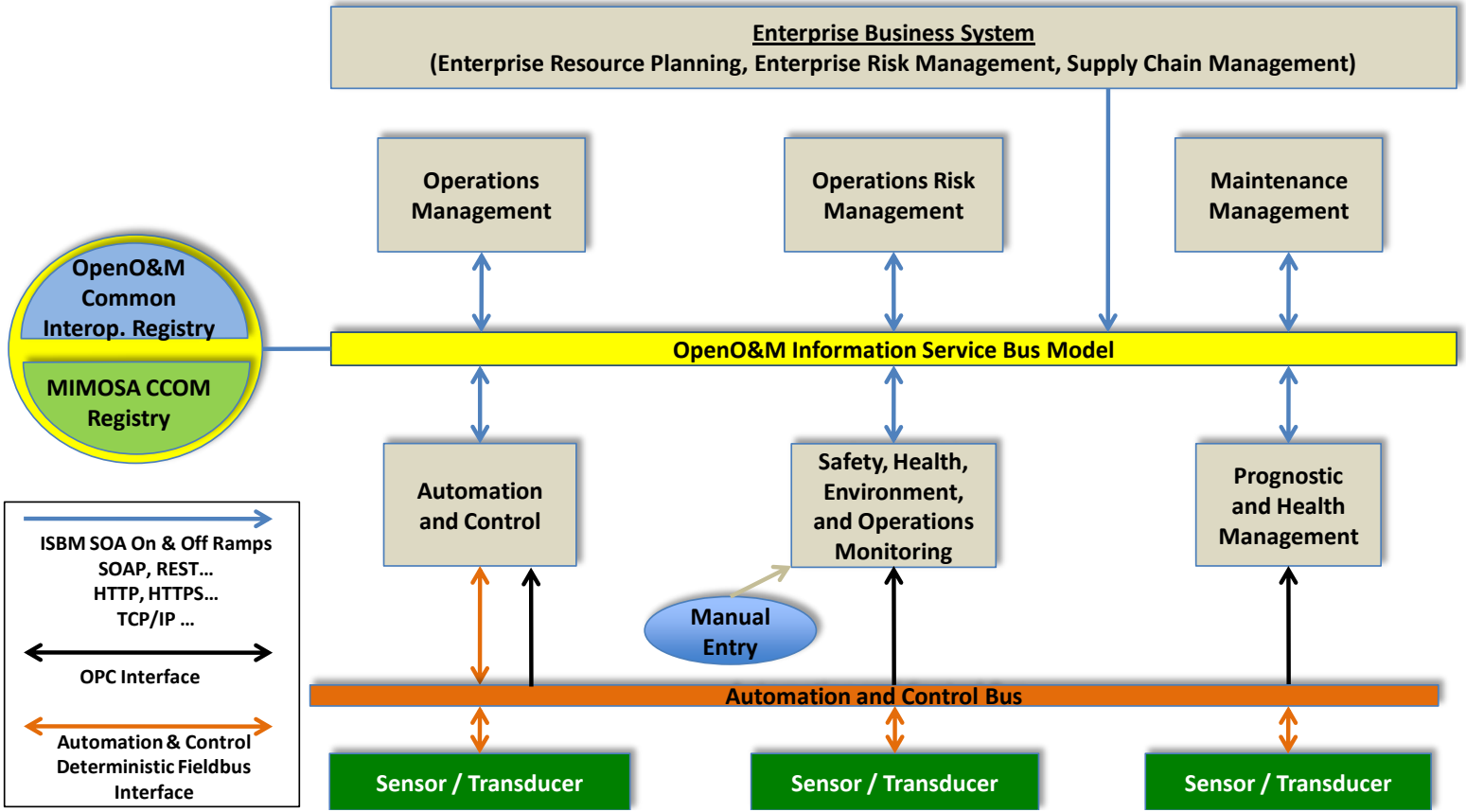
The OpenO&M Use Cases are mapped to the Systems and Scenarios and then to the standards supporting the required data flows.

Key Use Cases

1. "handover" as-designed/built information from engineering, procurement, construction phase to O&M phase
2. recurring updates - send engineering upgrades to O&M systems
3. field engineering changes sent to engineering (bottom up)
4. on-line product data library updated with engineering reference information (asset based data)
5. operations & maintenance configuration changes (e.g. remove/replace transmitter)
6. preventive maintenance (PM) triggering
7. condition-based maintenance (CBM) triggering
8. early warning Notification
9. incident management – actual & near-miss information captured and escalated along the lines of accountability

Second Generation SOA – Information Bus

The Execution Environment



OPPORTUNITY: LEVERAGE BEST PRACTICES, STANDARDS AND TECHNOLOGIES DEVELOPED ON A CROSS INDUSTRY BASIS

Critical Infrastructure Management

Dual Use Technology Investment

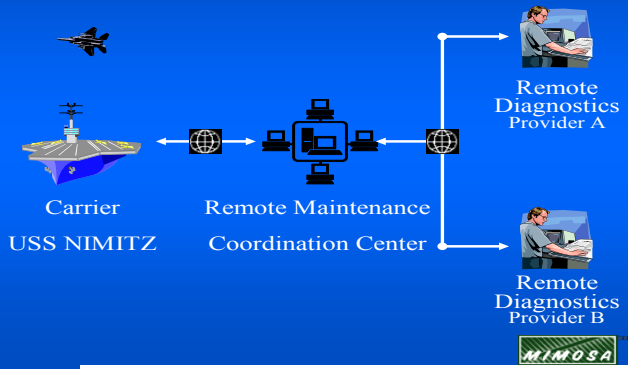
Applying Commercial Off The Shelf Solutions to Solve Complex Problems

OSA-CBM Dual Use Technology Program - Office of Naval Research

MIMOSA Information Network (MIN)

June 21, 2000
MIN-Viewer
OSA-CBM Presentation
Alan T. Johnston
MIN Project Director

The OSA-CBM MIN Demonstration Concept



MIN-Viewer Segment Navigation 1

Army Collaborative Telemaintenance – Army CECOM

U.S. Army CECOM
Collaborative Telemaintenance Project

Phase I Demonstration Briefing – July 31, 2002

Alan Johnston – MIMOSA
Kenneth Bever – MIMOSA
Bob Walter – Penn State ARL

MIMOSA

U.S. Army Collaborative Telemaintenance Demonstration

Revised 07/03/2002 – Phase I Demonstration

Demo Architecture Based on **reusable** MIN-Client™ & MIN-Server™ Components

Maintenance Subject Matter Expert (SME)

Central Maintenance Aid (CMA)
User Interface (CGUI)
CMA Data Services (CDS)
MIN-Clients Reg Dyn Trend Work
XML
MIN-Servers Reg Dyn Trend Work
CMA Database Services (CDBS) Persistent DB

CMAG

Maintenance Technician (MT)

Condition data
Failure and diagnostic info
Request for work

Simulated Platform (SP)

Condition Data
Request for data

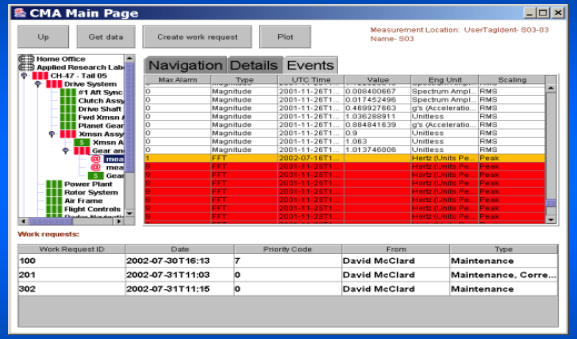
Portable Maintenance Aid (PMA)
User Interface (PGUI)
PMA Data Services (PDS)
MIN-Clients Reg Dyn Trend Work
XML
MIN-Servers Reg Dyn Trend Work
PMA Database Services (CDBS) Persistent DB

PMAG

MIN-Client & MIN-Server are Trademarks of MIMOSA

MIMOSA

CMA Showing Measurement Events In Alarm



MIMOSA

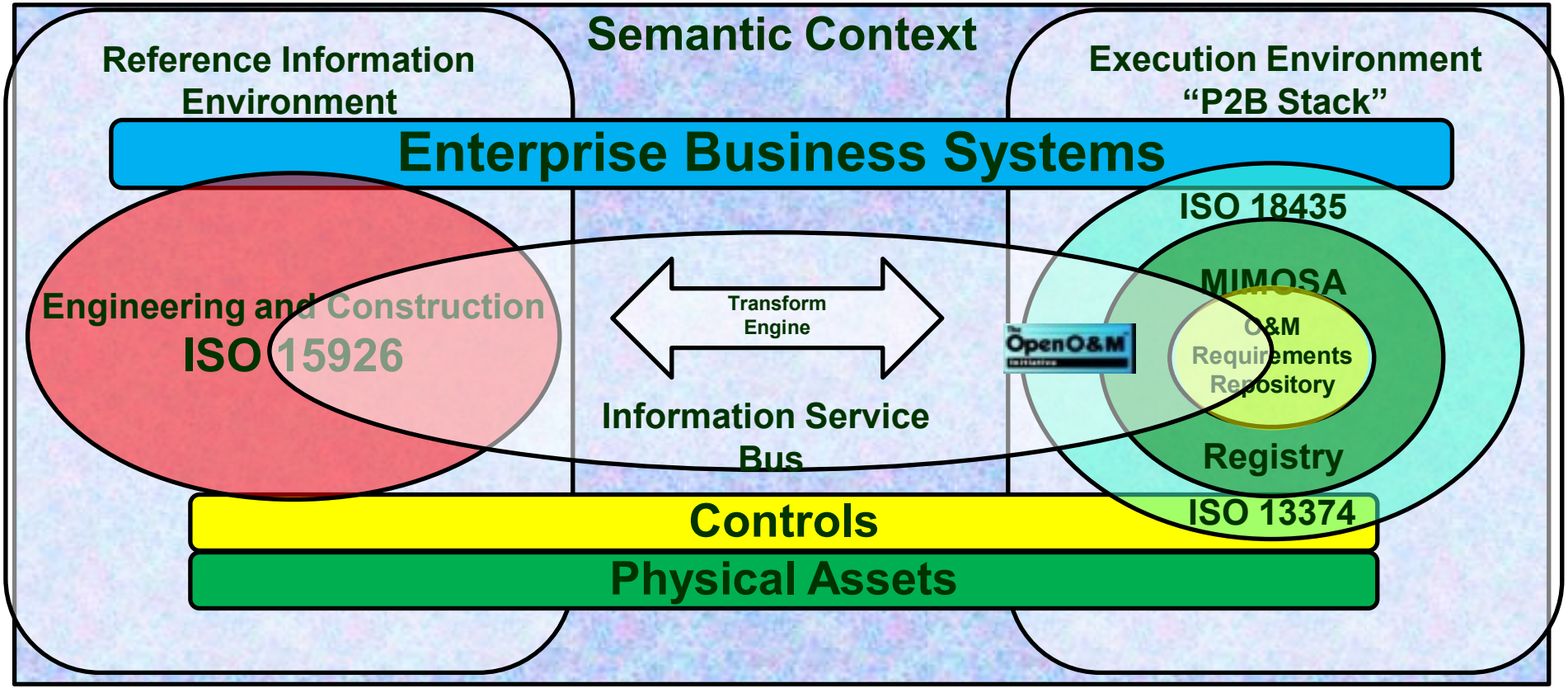
ISO TC184

Oil and Gas asset management operations and maintenance Interoperability (OGI) Technical Specification Proposal

Nils Sandsmark and Alan T. Johnston
Co-Chairs

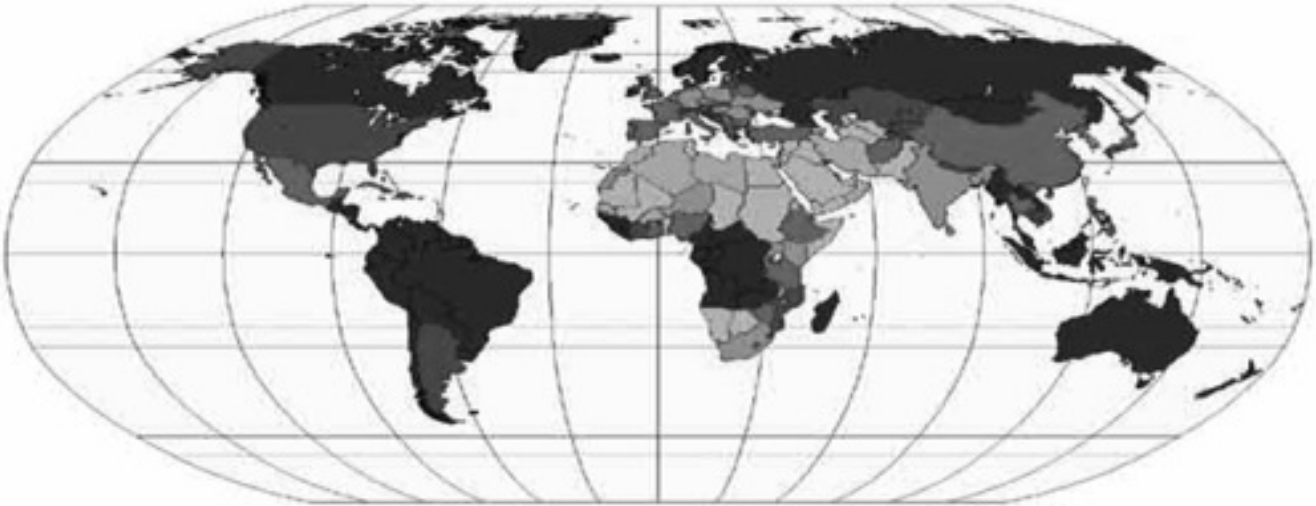
ISO TC 184 Plenary
May 4, 2010
Rosslyn, VA

Context for Collaboration



Task Force Result
Global Collaboration

- MIMOSA/OpenO&M
- FIATECH
- POSC Caesar
- Center for Integrated Engineering Asset Management (CIEAM)



MIMOSA/OpenO&M, FIATECH, POSC Caesar and the CIEAM have begun collaboration on a global basis to foster improved approaches to open standards-based interoperability for asset management through an industry-use case driven solutions process.

ISO TC 184