

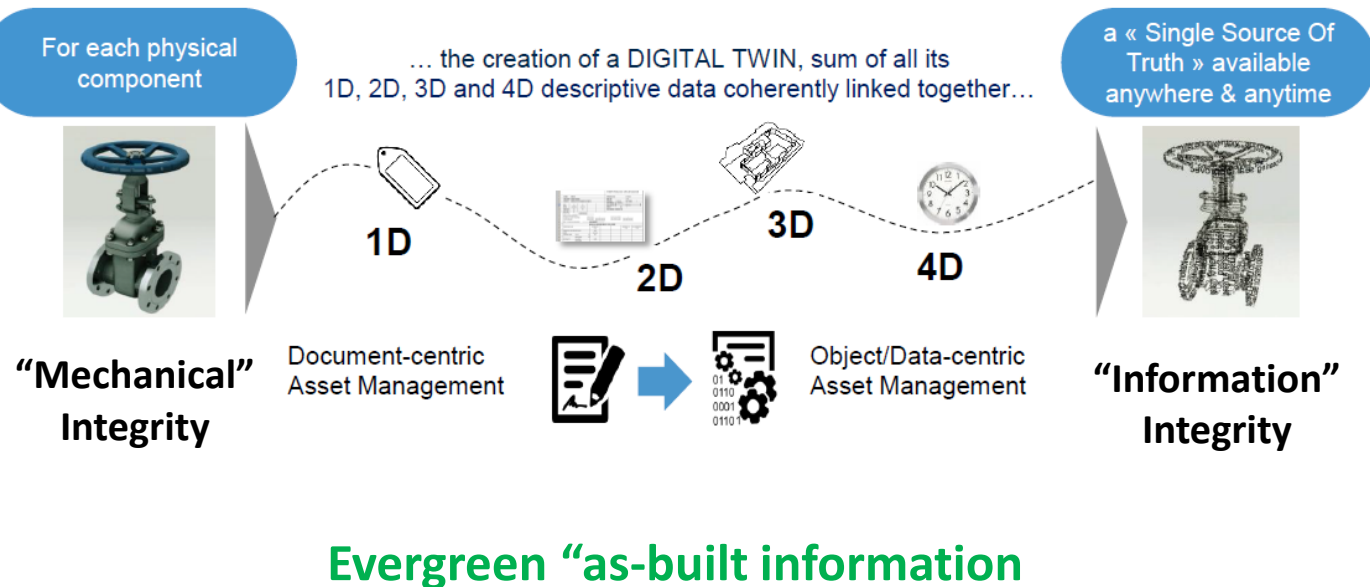
An one hundred thousand foot view of IT IM World

ISO/TC 184/SC 4/WG 3 Expert, Secretary
ISO/TC 184/WG 6 Expert
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Challenges & Opportunities

- give a green lite to innovation -

“Digital Twin”



Courtesy CFIHOS Project

Challenges:

- Integrity issues
- Interoperability issues;
- Systems integration cost;
- Data quality issues.

Opportunities:

- Plug and Play;
- Vendor Neutral;
- Archive and reuse information;
- Model Based.

Standard Model based Asset and Facility Management

Process and systems engineering driven

PERA

Cost of Capital
and Insurance
Cost are both
based on risk.



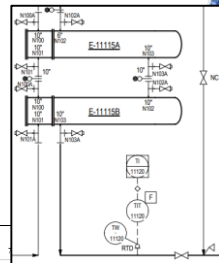
Risk Models



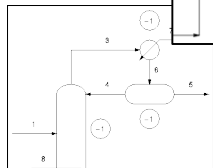
Business Process Models



Components Models



Systems Models



Industrial Process Models

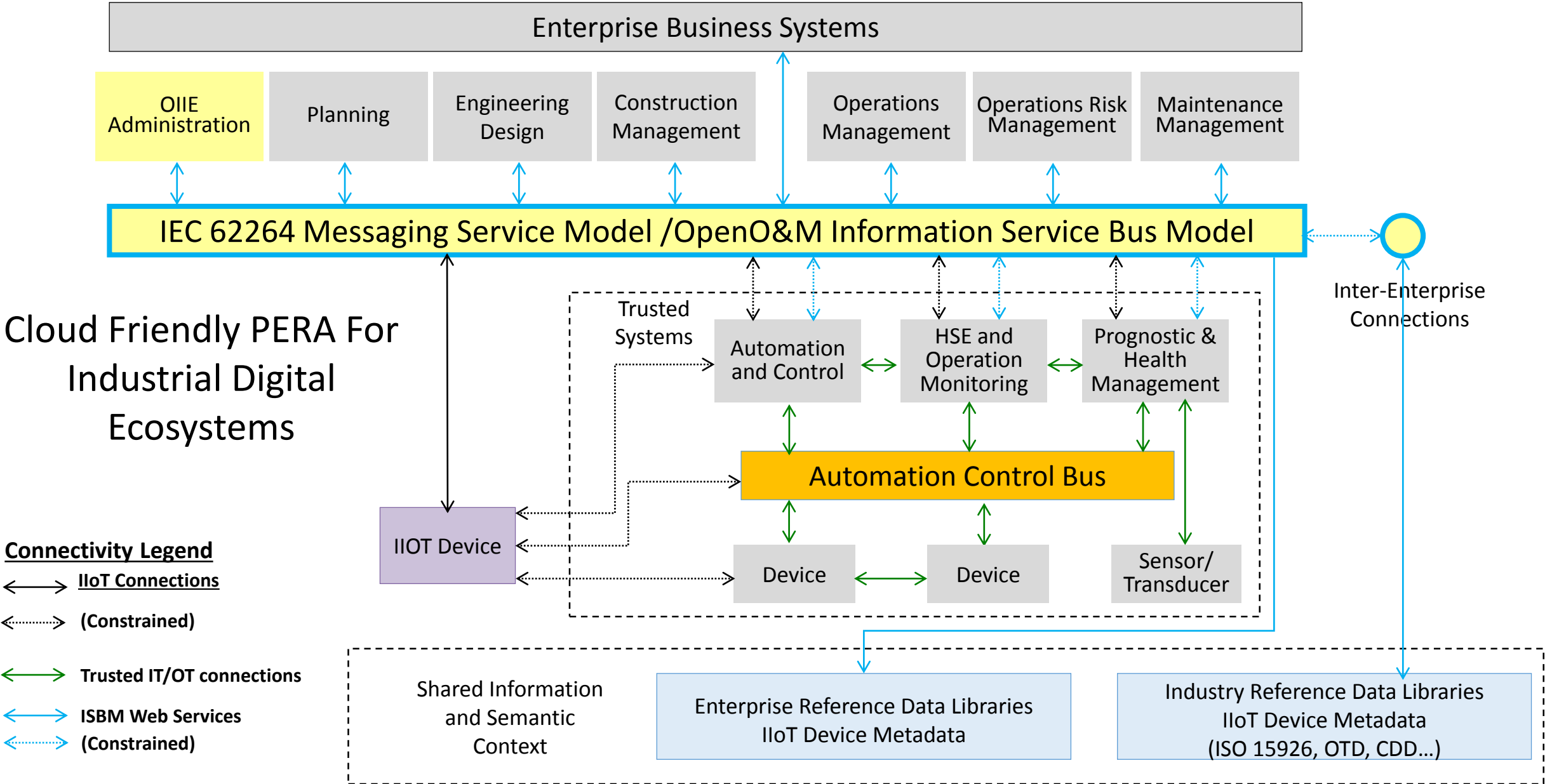
Binding, Engineering, Design, O&M



Trusted Systems

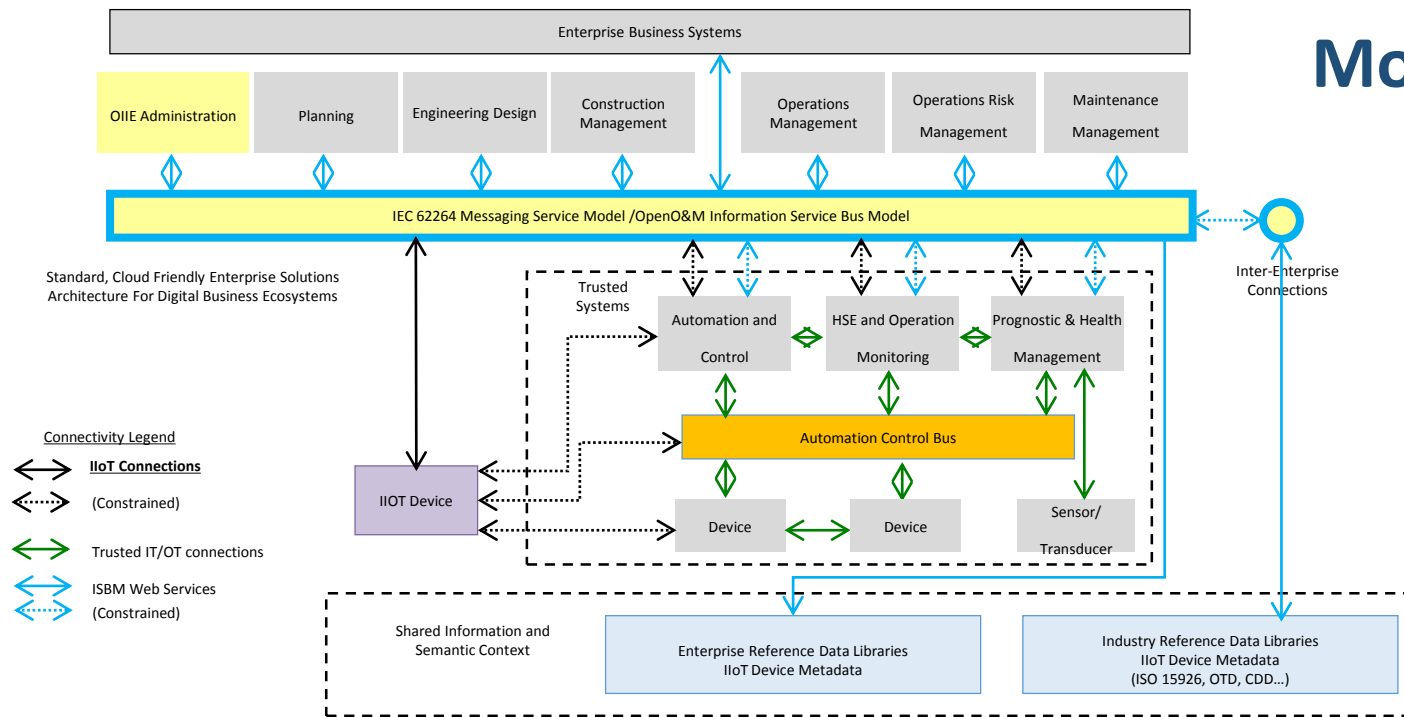
IIOT Sensors

OIE Simplified Systems Connectivity and Services Architecture



Digitalization and Interoperability

- includes IT IM -



Models Included

- **Implementation**
 - ✓ Persistence – Proprietary;
 - ✓ Exchange - MIMOSA CCOM;
- **Fit for Purpose;**
- **Pragmatic/proven;**
- **Multiple-RDLs**

The Recommended Practices

- don't reinvent the wheel: Increase productivity with strategic reuse -

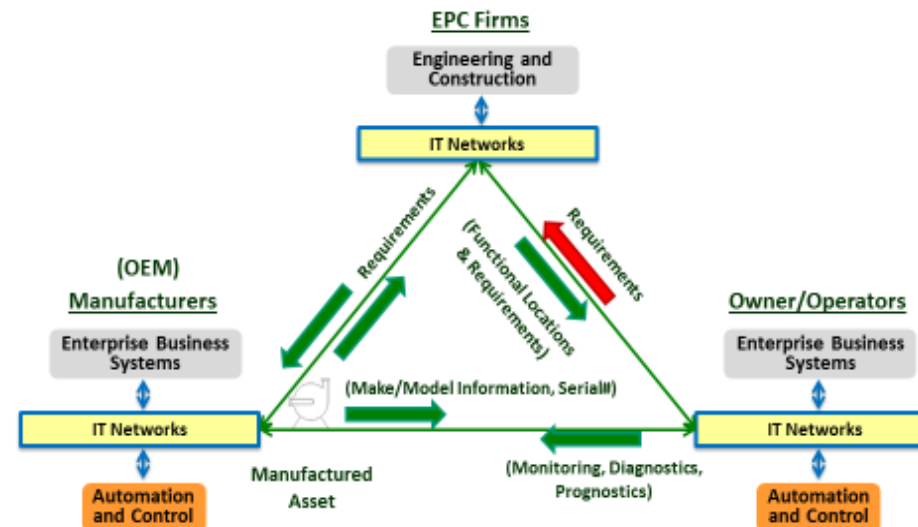
- A big Question:

“Build solutions from scratch each?”

- Recommended Answer:

“Adopt and adapt existing standards among all participants.

If appropriate standards don't exist, team cooperating organizations to



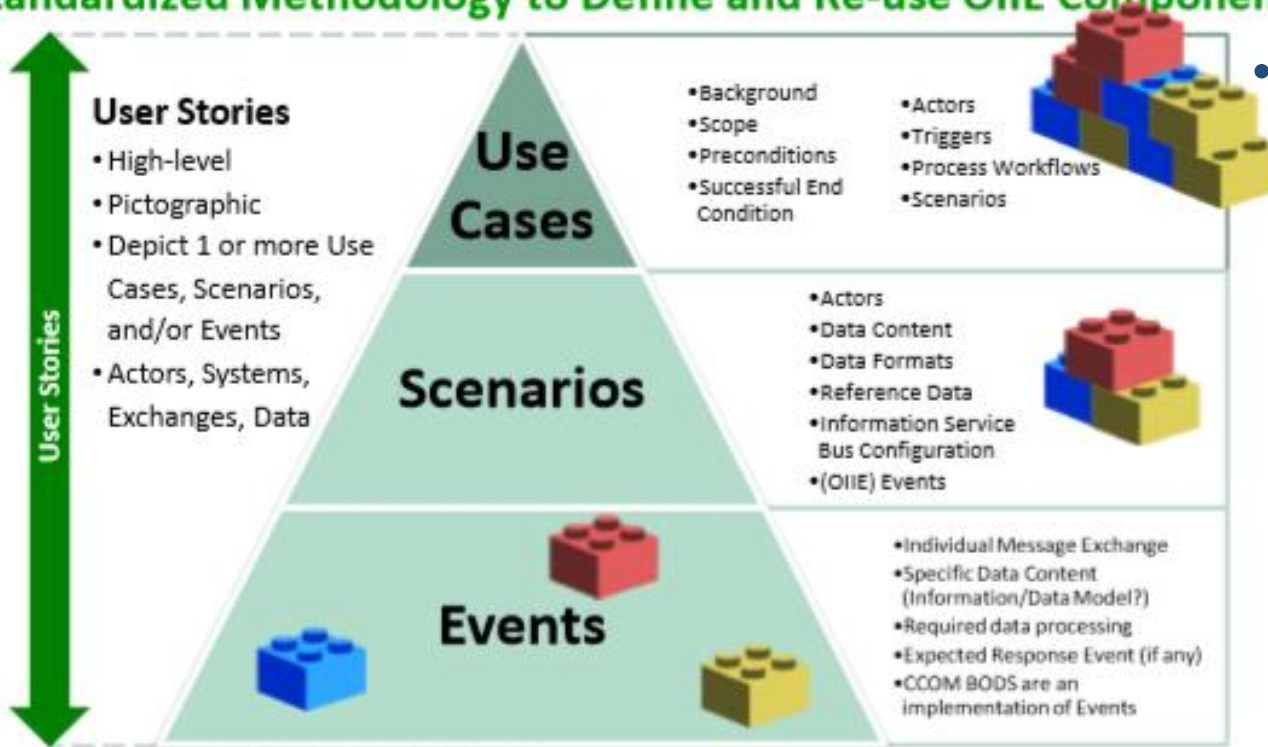
Courtesy ISO 18101-1

OGI Pilot

- don't reinvent the wheel: Increase productivity with strategic reuse -

OIIE/OGI Standardized Use Case Structure

Standardized Methodology to Define and Re-use OIIE Components



• OIIE and OGI Pilot

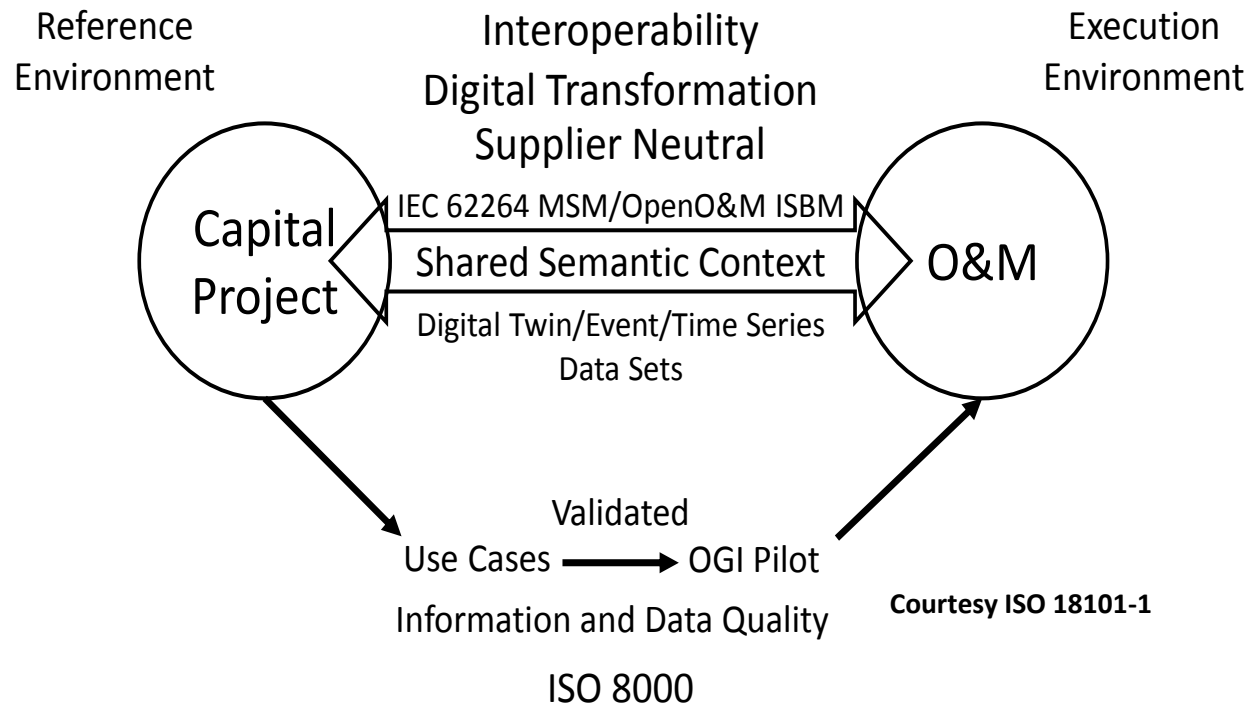
- Driven by standard industrial use cases
- Standard industrial digital ecosystem architecture
- Standard industrial use case architecture
- Standard information models
- ISDDs specify property sets
- Standard reusable scenarios and events
- Repeatable, scalable and sustainable
- ISO 8000 – Data quality
- CCOM – Contextualized Exchange – Asset Mgt

Figure A.2 – Standardized Use Case Structure

Courtesy ISO 18101-1

A path forward

- Pragmatic basis for Industry Digital Transformation by 2020
- Incremental Delivery – Specify, Validate, Standardize



Follow Recommended OIIE practices

- ✓ **User Stories – Standard Use Cases**
 - Standard Scenarios;
 - Standard Events;
- ✓ **OGI Pilot to validate the process;**
- ✓ **Technical Reports (OIIE and ISO);**
- ✓ **Drives next OGI Pilot sub-phase;**
- ✓ **Drives next parts of ISO 18101.**

Questions and remarks?



Process Industry Smart Manufacturing

- Agile Integration and Standards Based Interoperability

Systems Integration and Interoperability Management Process

Analytics can be performed in all levels using the Models to Contextualize the Sensor-based Information. Other significant events are also captured for analysis, including those resulting in Configuration Changes resulting in Model Changes.



Enterprise Management Models

Supply Chain Integration

ERP Process Models

Industrial Process Models

System Models

Components Models

Equipment Models

Device Models

Sensor Models

Systems Interoperability Management

Processes, Systems & Components Integration Modelling

Trusted S for systems

IIOT Sensors

P
E
R
A

L4

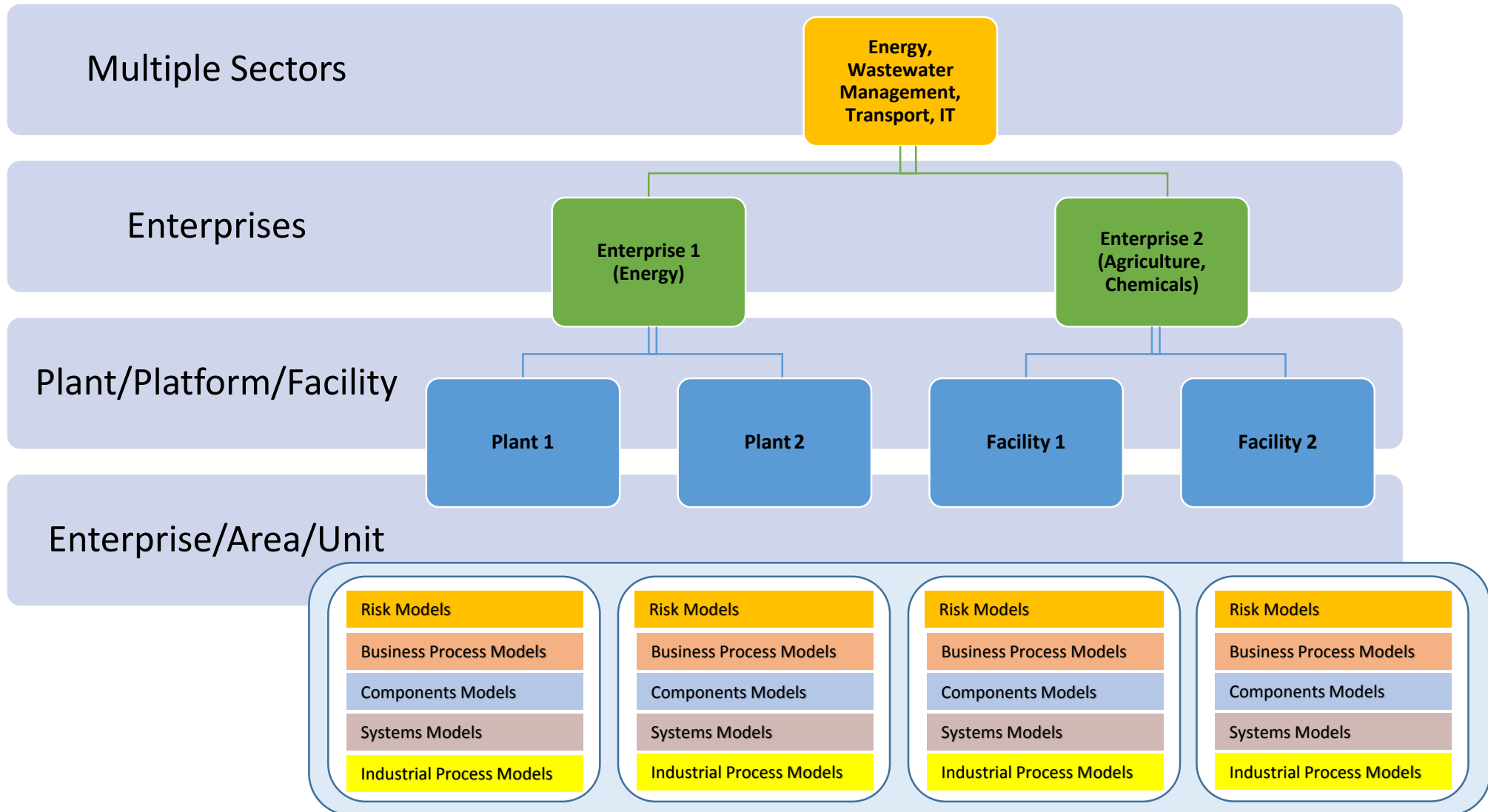
L3

L2

L1

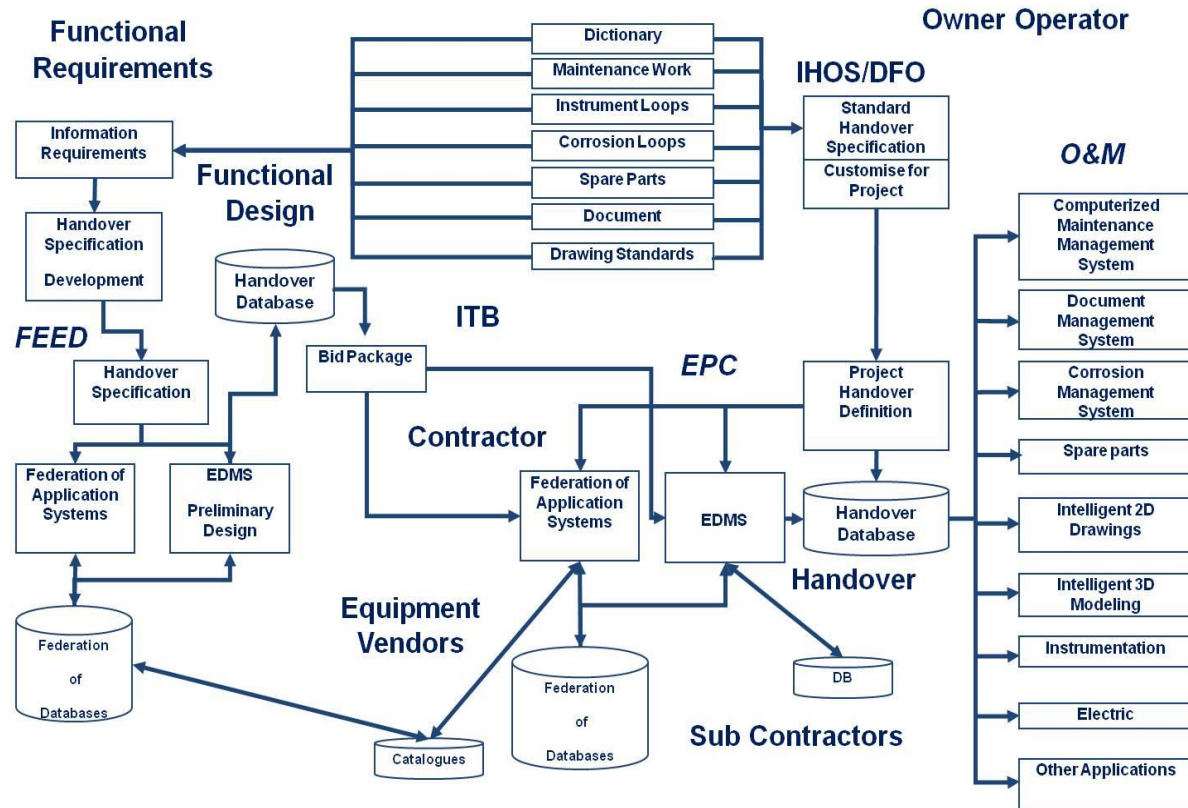
Critical Infrastructure Management Process

-Public/Private Cross-Sector



The Digital Assets

- where IT IM resides to provide information-



Courtesy CFIHOS Project

Models Included

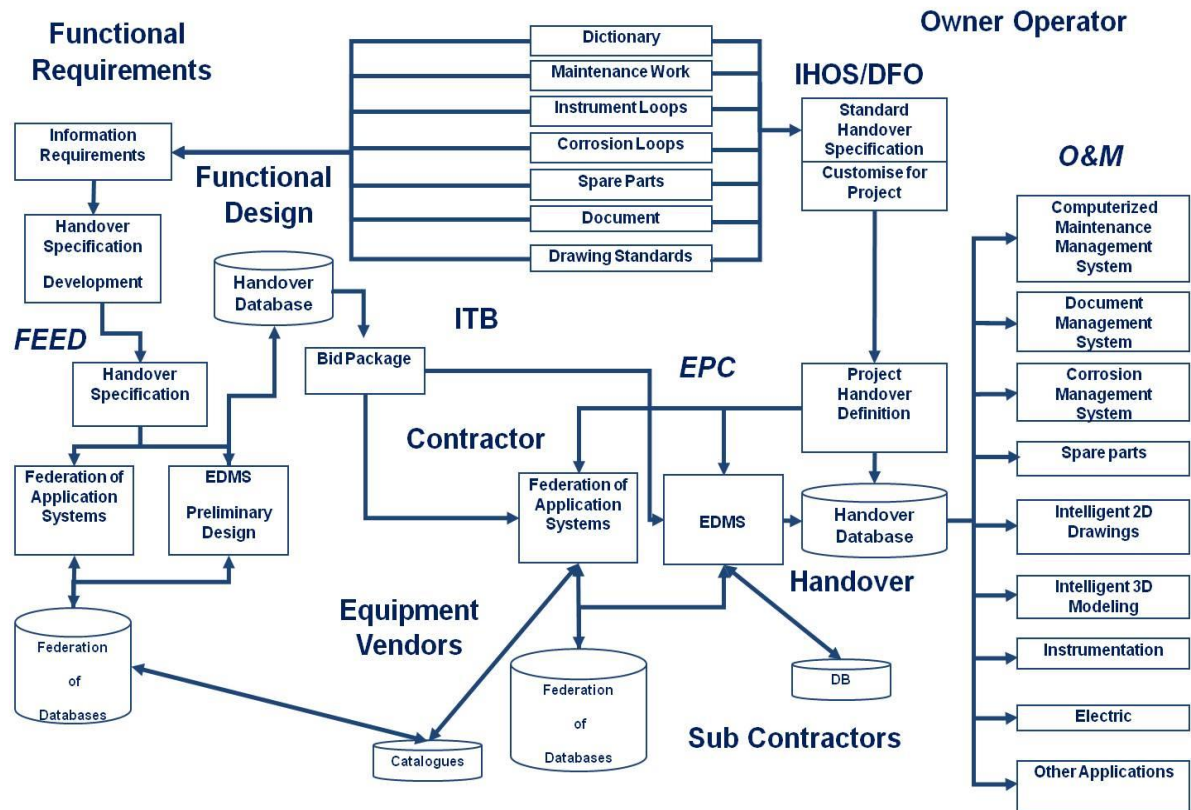
- Data Models

- ✓ Conceptual – Original ISO 15926 data model;
- ✓ Implementation
 - Persistence – Proprietary;
 - Exchange – csv file;
 - ◆ Common dominator.

Same thing over again for each execution of the projects.
Is this good enough to do your job?

The Digital Assets

- where IT IM resides to provide information-



Models Included

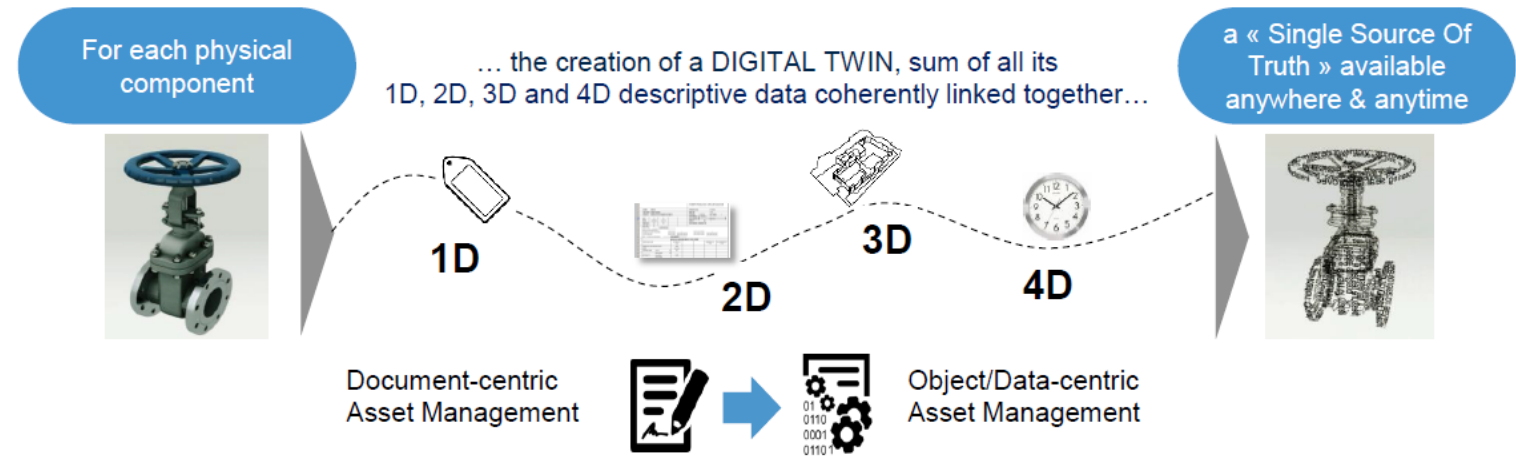
- **Activity Model**
 - ✓ PISTEP Activity Model;
 - ✓ ISO 15926-1;
- **Data Models**
 - ✓ Conceptual – Old ISO 15926 data model;
 - ✓ Implementation
 - Persistence – Proprietary;
 - Exchange - MIMOSA CCOM;
 - ◆ Fit for Purpose;
 - ◆ Pragmatic/proven;
 - ◆ Binding, Engineering, Design, O&M;

Data driven asset management

- Because  we care what you do on the assets-

Enhanced Operational Efficiency
 Accelerated response time to notifications & emergency situations
 Accelerated preparation of intervention
 Accelerated training capabilities
 Improved risk assessment
Cost reduction
 Improved risk assessment
More efficient, fact-based decision making
 Easy Hand-Over process
 Improved collaboration
 Ensured sustainability
Capitalisation on existing work
 Enhance Asset knowledge
 Better traceability & control of modifications
Reduced people exposure to risks
 Break silos between metiers
 Improved risk assessment
 Hand-Over process
 Improved collaboration
 Ensured sustainability
 Capitalisation on existing work
 Enhance Asset knowledge
 Better traceability & control of modifications
 Reduced people exposure to risks

“Digital Twin”



The Digital Twin gathers all the technical information describing an installation in a single source, usable by all, in collaborative mode

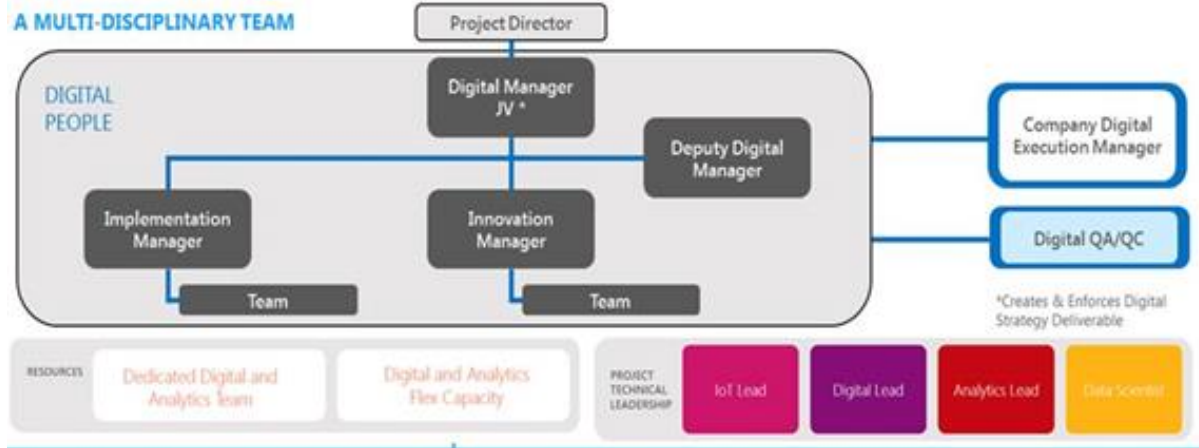
Courtesy CFIHOS Project

Courtesy CFIHOS Project

The Digital Organization

- Something new in our atmosphere? -

Enable Lean Team

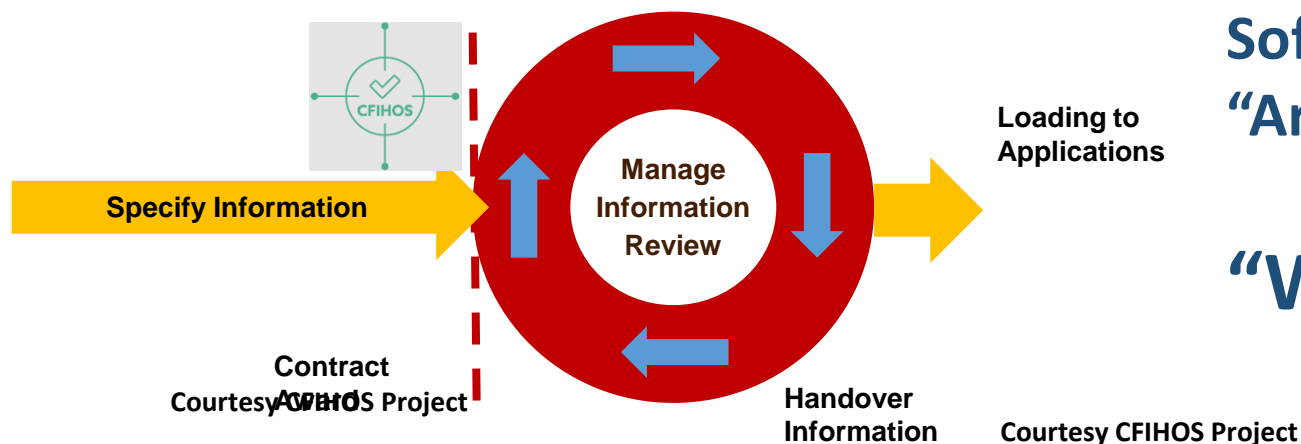


A proposed new project management organization:

- Go “Digital” a new breed of the project organization in charge;
- Making a use of emerging ICT.

Software Suppliers now Saying:
“Are you “CFIHOS” ready?”

“What does it mean to you?”



Challenges & Opportunities

- Give a green lite to innovation -



Courtesy AVEVA CFIHOS Project

Challenges:

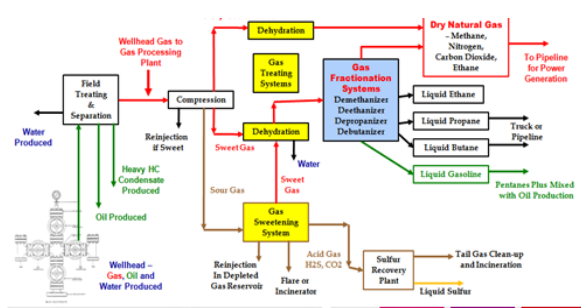
- Interoperability issues;
- Systems integration cost;
- Data quality.

Opportunities:

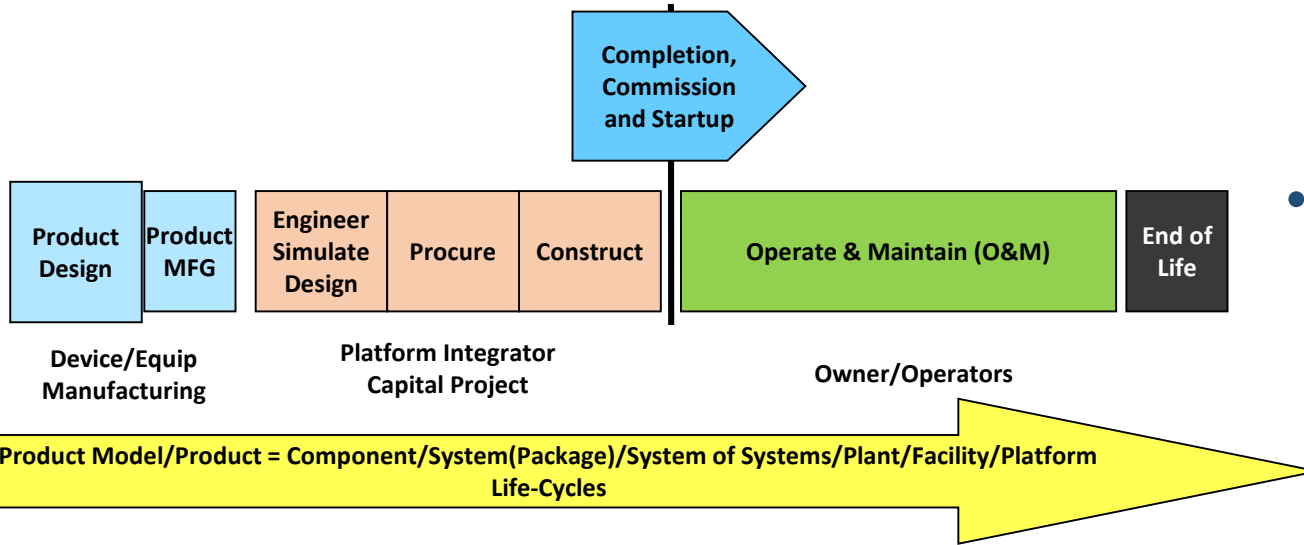
- Plug and Play;
- Vendor Neutral;
- Archive and reuse information;
- Model Based;
- Evergreen “as-built information;”
- Integrity between Physical Assets and Digital Assets.

The Physical Assets

- Things you can kick -



Mechanical Integrity



Courtesy ISO 18101-1

- Conventional “Engineering” – what we’ve been doing for living;
- From process design schematics (conceptual) to facility (things you can kick);
- Life-cycle representation including a take-over and hand-over process.
- Smart manufacturing – EPC and O&M using OpenO&M:
 - ✓ ISBM/IEC62264 MSM;
 - ✓ ISA95 - Operation Management;
 - ✓ OAGi – ERP B2B, e-commerce;
 - ✓ OPC – Automation Data Exchange;
 - ✓ MIMOSA – Asset Management, CCOM.

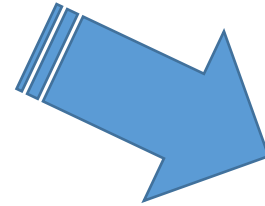
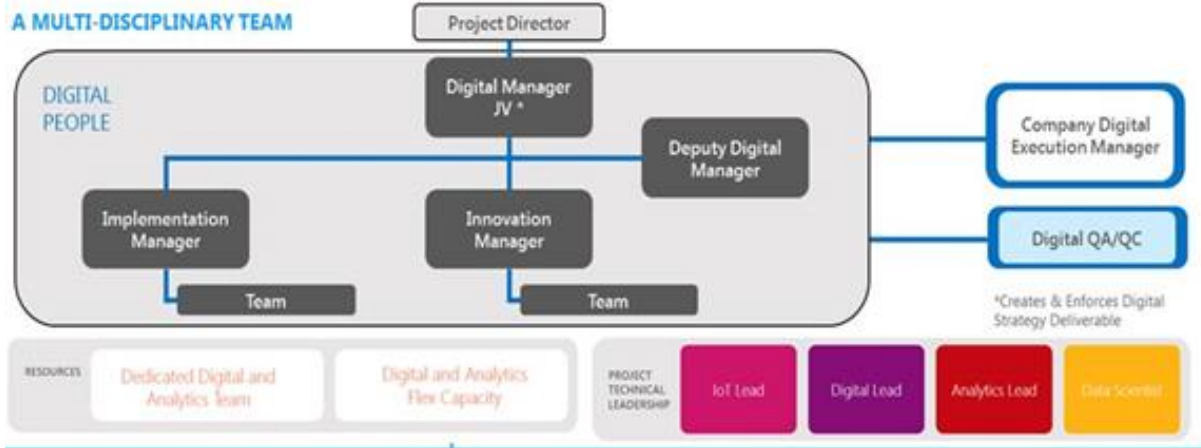
The Digital Assets

- What is required-

- From innovation to implementation, follow the leader, the PERA – Target Architecture;
- The master plan first;
- Relying on information from the outsourced EPC process;
- Progressive handover to get ready for the 1st Oil.

Enable Lean Team

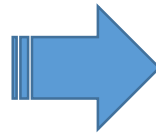
A MULTI-DISCIPLINARY TEAM



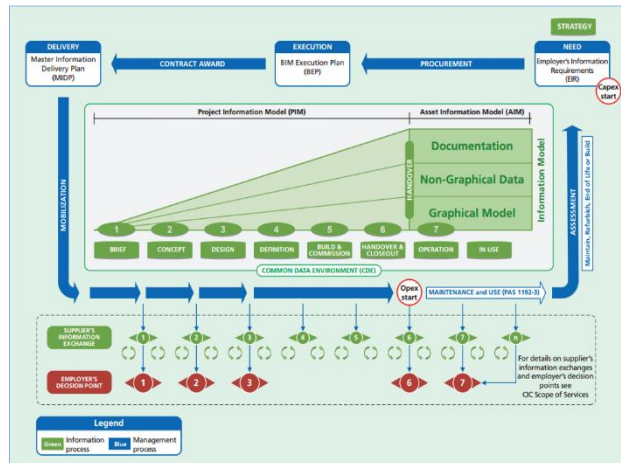
Innovation



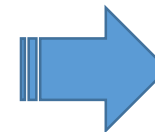
Information Handover specification



Architecture specification



Handover Information



Commissioned systems

Interpretation

