Asset lifecycle definition of engineering information to support Operation, Maintenance and Projects

Business Case – Our Challenge

How to move from the current position of;

- Intelligent schematics (P&ID’s) (2d)
- Intelligent Instrumentation system auto producing project deliverables (2d)
- Multi-discipline 3d modelling supporting BIM and auto-generating piping deliverables (3d,4d,5d)

To a position of integrated design systems that follow a defined Asset Information Lifecycle and support digital handover

Key Enabler;
Governance for the creation of a The Digital Asset
The Digital Asset

- Follows a defined lifecycle
- Is created from many sources
- Defined by a master model definition
- Has value to multiple consumers
- Value increased when the defined digital Asset reflects the physical asset

Asset Information Lifecycle
Asset Information Landscape

The Class Library & the Data Model

The Class Library is a grouping of allowable equipment types and the expected data associated with them.

The Data Model is supported by the class library and identifies the way that data is created, manipulated & measured as it flows from concept through Construction, Commissioning and Operations.

Information Management Governance is the foundation that defines how the data model is implemented and is a source of Clarity for project delivery requirements (1D).
The Tag

Information Governance (e.g. Pump)
- Is classified as a functional object
- Its function is satisfied by a number of physical classes
- Must be named
- Must belong to a number of taxonomies (e.g. Process Hierarchy & Maintenance Hierarchy)
- To be complete requires Attributes (e.g. pressures, Temperatures etc)
- To be complete requires 4 documents (e.g. Datasheet, P&ID, Operations manual etc)
- Can have a parent tag (e.g. Skid or package)
- Belongs to an Area
- Belongs to a System
- Requires a Manufacturer
- The function of pump can be physically satisfied by a number of types of pumps (e.g. Centrifugal, Piston, Diaphragm etc)

The Class Library - Classes

Structure the equipment types that are to be tagged into classes

The Class and its description

Image extracted from Aveva - ISM
The Class Library – Functional & Physical

By defining a relationship between the Tag Class and the Physical Class, enriches the data associated with the Tag by implying the Asset’s Data to the Tag Item.

The Class Library – Attributes

Normalisation & allocation of Attributes to Classes and rules for their format and lifecycle
The Class Library – Tag Template

Classification
- Equipment
- In-Line
- Instrument
- Pipeline
- Pump
  - Centrifugal Pump
  - Diaphragm Pump
  - Piston Pump

TAG

Model

Properties
- Properties
  - Sub Classes
  - Taxonomy Occurrences
  - Extensions
  - Languages

Class Library - Relationships

Functional Tag Class
- TAG Class Responsibility
- TAG Class Phase

Physical Equip Class
- EQP Class Responsibility
- EQP Class Phase

Tag types can be related to REFERENCE Objects. REFERENCE Objects are items that can carry properties and dependencies to further enrich the tag data.
The Class Library - Relationships

The Class Library - Rules

The application of rules across multiple disciplines and systems

Naming Conventions

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<th>Details</th>
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<th>Permissible Elements</th>
<th>Extensions</th>
<th>Languages</th>
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Unit of Measure Rules

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The Class Library - Responsibility

- ISO 15926 Industrial automation systems and integration -- Integration of life-cycle data for process plants
- PAS 1192 Specification for information management for the capital/delivery phase of construction projects using building information modeling
- ISO 29481 Building information models -- Information delivery manual
The Class Library – Property Characteristics

TAG Property Requirements gained by relationships

TAG Property Characteristics. These Scoped by Characteristics ensure data is validated and allow Viewing and sorting of properties by phase and responsibility

The Class Library – The Tag

Framework
IM Governance
The Equipment Class Library – 1D

- The Data Model needs to be object based and in context
- Consider the Functional and the physical requirements of each class of object
- Consider the Data Requirements for each Phase of the Lifecycle
- Consider the ownership and responsibilities of the data requirements through the phases of the lifecycle.
- Consider the characteristics of class attributes to influence data management processes and tools
- For every physical asset there must be a digital asset

Project Delivery Requirements Report

Contractual clarity across all phases of the project based on the Information Governance
Digital Handover

An Information Governance framework has delivered:

- Clarity of project scope per discipline per phase per stakeholder
- Definition of System integration requirements
- Support for Digital Handover

Business Case – The Result
Thank You – Questions & Answers

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