The Challenges and Opportunities of Digital Transformation in the EPC Industry

Why sharing data through a Single Source of the Truth hinges on Data Standardisation

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Introduction

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- Fellow and Global Cost Management Lead in Fluor

- Involved with tool development, updating practices, training and system support

- Master of Science in Mechanical Engineering from University of Natal, South Africa – 1990

- 25 years in EPC management sector (18 with Fluor)

- Certified Cost Professional with AACE® International since 2004

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Takeaways

The Context of Data Standards

What are we doing

Why it hinges on standardisation

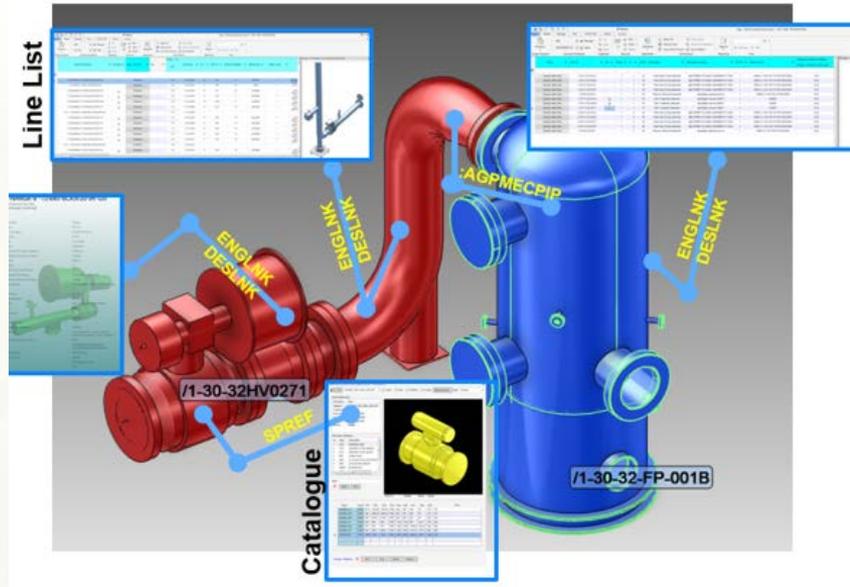**The Challenges**

The Benefits

Wrap-Up

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Context: Object Based Data

Projects use data through the entire life cycle of the project across multiple applications

- ▶ Engineering 3D model
- ▶ Data sheets
- ▶ Engineering drawings
- ▶ Fabrication deliverables
- ▶ Construction
- ▶ Commissioning
- ▶ Asset data
- ▶ Cost data
- ▶ Schedule data
- ▶ Handover – Digital Twin

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Context: Single Source of the Truth

Example

▸ Tag item data that cascades through design, construction and operations

▸ Status of design
  – Design status – e.g., issued for construction
  – Timing of data
  – Progress measurement
  – Cost of supply and installation

1D   2D   3D

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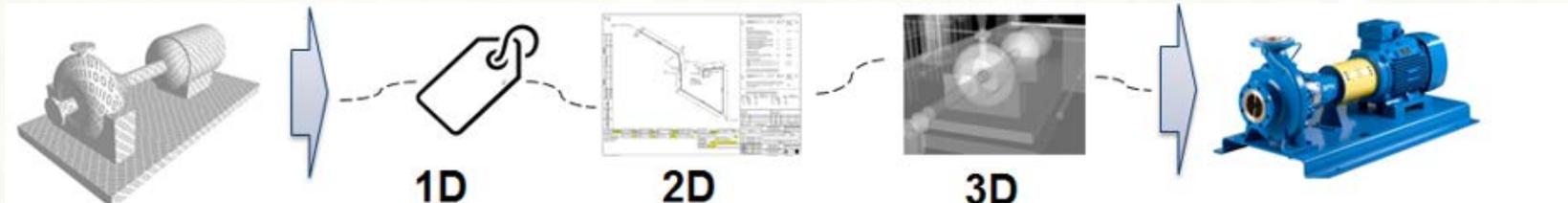
Context: Progress for Better Financial Decision Making

Traditionally

▸ Engineering provided design specifications

▸ Facility delivered with a library of paper documents

▸ Much of the documentation was not used during operation and maintenance

▸ Difficult to find required information

Full Plant Life Cycle

▸ Object oriented data is created, structured and stored from concept to operation

▸ Different data structures are required for different phases and purposes

▸ Good data standards provide the mechanism to share attributes effectively

▸ Benefits for predictive maintenance, impact on reducing downtime, aids real time monitoring

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Our Vision and Plan

▸ Data centric execution – data highway

▸ Need for data sharing

　– Through different tools, systems and processes

　– Between disciplines and contracting entities

　– Information related to

　　▪ Technical specifications

　　▪ Status

　　▪ Cost and schedule

　　▪ Actual asset details and status for maintenance

▸ Different systems use different levels of detail

Data standards:
Defines data attributes in information exchange between contracting parties

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The Standardisation Argument

Hardware Specifications

- Process
- Equipment
- Facilities, structures and infrastructure
- Layout and piping
- Electrical and control systems
- Health, safety and environment

Budget and Change Management

Planning and Progress

- Improving project execution success rate
- Data standard → language
- Helps to provide predictability and reduced costs
- Data lives beyond the project and supports operation and maintenance of completed facility
- Provide suitable data attributes that works throughout the facility life cycle

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Challenges

- Adoption of data standards by diverse groups
- Support the needs of different groups
- Common understanding for the need to enrich data with suitable attributes
- Requires more effort up front to reap benefits later
- Needs to support the originator's work processes
- Sharing of data with different consumers
  - Different levels of detail
  - Aggregated data

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Benefits

▸ Move away from data in special spreadsheets and local databases

▸ Reduce the risk of working with outdated or premature data

▸ Good standards provide more predictability

  – Improved multi-variable correlations in agnostic neural networks (artificial intelligence)

  – Enhanced historical data to benchmark new projects

▸ Standardised data can also be applied to new technologies providing a level of predictability in unchartered areas

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Wrap-Up

▶ Data is used throughout the project and facility life cycle

▶ Attributes are used across multiple systems

▶ Data standards are critical to achieve suitable results specific for the function that it is required for

▶ Risk of cost and schedule overrun is managed by implementing data standards correctly

▶ Applying standardisation to connect data between systems is an evolutionary process of continuous improvement

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