The role of the Smart Digital Asset in optimizing offshore operations efficiency, safety and predictability

Adrian Park, Vice President, Information Management
AGENDA

• A brief introduction to Hexagon
• Digital Twin/Smart Digital Asset
• Providing interoperability and example Integration with SAP PM?
• Capturing the Brownfield Digital Twin
• Handover Challenges
• What is the CFIHOS standard?
A brief introduction to Hexagon
Hexagon at a glance

Technology Solutions Provider
- Established leader in information technologies
- Solutions drive productivity and quality improvements

Global Reach
- Broad range of vital industries served
- More than 18,000 employees in 50 countries

R&D Focused
- 10-12% of net sales invested in R&D
- 3,400+ employees in R&D
- 3,200+ active patents

Strong Financials
- 3.1 bn EUR in sales
- 23.4% operating margin
Hexagon’s primary divisions

Our divisions serve three primary landscapes – manufacturing, engineering and geospatial. Each is committed to pioneering innovations in business processes, value chains and information exchange.
Fusing the real and digital worlds delivers dynamic data and actionable information.
Building a bridge from the edge to the cloud

Processing data as it occurs at the edge while coordinating with centralized cloud technologies
Digital Twin/Smart Digital Asset
Smart Digital Asset – Digital Twin

• «A digital replica of physical assets, processes and systems that can be used for various purposes» GE Digital

• Key Aspects:
  • *Includes asset configuration, geometry/topology and metadata*
  • *Includes information from IoT sensors*
  • *Dynamic and constantly evolving*
  • *Can be leveraged to enable value added work processes*
  • *Can be analyzed, include AI/Machine Learning to provide meaningful insights*

• *Is a prerequisite to enable successful digital transformation of work processes*
Positioning of SDA / Digital Twin in the Operator system landscape

Operational process control and analysis

Control Systems & Data Historians
Emerson / Honeywell / OSI-Soft

ERP / CMMS
SAP / Maximo

Predictive maintenance for plant reliability

Asset Reliability
Meridium / Emerson

Smart Digital Asset
Operational excellence through leveraging Plant Digital Twin
Hexagon PPM’s Smart Digital Asset RoadMap Vision

Processes/Procedures

Digital twin repository

Enabling the Mobile Workforce

Short Term

SDA

Longer Term

Analytics

Rules Engine

Risk Management

Extended Reality
Realize the potential of SDA

- Advanced Sensors
- Internet of Things (IOT)
- Digital Twin
- Machine Learning
- Analytics
- Mobility

Smart Digital Asset
Digital Twin – scenario in predictive/perscriptive maintenance

Physical Asset

Plant Engineer
Using Augmented Reality and Daqri Helmet

Scanning

Control
Operator takes over control by schedule maintenance (e.g. ordering spare parts, sending a technician, etc.)

Command Center

Fabrication

Digital Twin

Data from Sensors
- Anomaly Detection/Failure Prediction
- Rules Engine

Alert
Operator gets informed about potential failure(s)
HxGN Smart Visualization
Collaborative XR - Core technology for next gen products & Workflows
Providing Interoperability and example Integration with SAP PM?
Cloud Integration via web service APIs (RESTful/Odata 4)

Zero footprint web client

Providing transparent access to the Smart Digital Asset to users in the context of the systems they normally use

Mobile Online/Offline Access
SDA Connector for Plant Maintenance

Intergraph Smart® and SmartPlant Solutions

Intergraph Smart® Digital Asset
SmartPlant® Foundation
SmartPlant® Enterprise for Owner Operators
SmartPlant® Fusion

WEB SERVICES

• Maintenance Planning
• Inspection Planning
• Turnaround Planning
OWNER OPERATOR CHALLENGES

DESIGN MODIFICATIONS

PLANT EXTENSIONS

DE-BOTTLENECKING ACTIVITIES

Maintenance Management

Inspection Management

Reliability

Control Of Work

UP TO DATE
Synchronizing Engineering Tags with Operational FLOCs and Asset Information link

Hexagon PPM IM Products

Data & Docs

Sync TAGs to FLOCs

Create Synchronized FLOC object in SPO

Enable SAP user to view SPO information

SAP PM Maintenance Management

Asset Information Link
Demo: Asset Information Link for SAP

SAP PM Maintenance Management

Look-Up Engineering Data from within SAP PM FLOC Master data form
Capturing the Brownfield Digital Twin
Asset Lifecycle Information Management Cloud Service

SDA Operations

HEXAGON
PPM
Processing of legacy and submitted deliverables

Rapid Capture
Identifying Best Masters
Extract intelligence & creates links
Quality Control & Reporting
Information Browsing
Handover Challenges
Handover Challenges – handover effort

Project hours spent on information handover

As an EPC, what percentage of total project hours is spent dealing with information handover?

- 1-5%: 18%
- 6-10%: 17%
- 11-20%: 8%
- Above 20%: 6%

Source: Survey of 72 professionals in process industries
There is solid evidence around the industry that the handover costs on a conventional project, caused by poor information, are between 2 and 4% of Total Installed Cost (TIC).
Confidence in handover specification

How confident are you that the handover specification in your contracts reflects all organizational requirements for operating and maintaining the facility?

- Not confident: 1%
- Low confidence: 20%
- Only somewhat confident: 51%
- Completely confident: 23%
- We do not have a detailed handover specification: 5%
What is CFIHOS?
CFIHOS? (pronounced “See-Fos”)

What is CFIHOS?

• An emerging standard for Capital Facilities Industry Handover Specification

• Joint project sponsored by USPI (Netherlands) and ENAA (Japan)

• Based on Shell DEP, which has been used in 60+ capital projects

• A pragmatic extension of existing Industry Standards (ISO 15926, ISO 14224, API, ISA, POSC Caesar, etc.)

Why are we adopting it?

• We can deliver a working OOTB solution

• Avoid redesigning tag classifications and document types every project, reducing time, cost and risk

• Demonstrable today. Shell’s EIS configuration in EDW is CFIHOS.

• OO’s are asking for it

• EPC clients are adopting it
What is CFIHOS?

- Generic Scope of Work
- Generic Technical Specification
- Common Database Definition – Reference Data Library (RDL), Master Objects, Property, and Picklist definitions
- Tag Class, Tag Types and Properties per Tag type
- Equipment Class, Equipment Types and Properties per Equipment Type
- Document Types and properties
- Required Documents per Tag Class
- Model, Manufacturer
- Discipline, Discipline to Document Type
- Data Validation Rules
What is CFIHOS?

Yellow: Operations
Blue: Engineering (Project)
### Example CFIHOS Line List Register

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<th>Tag Number</th>
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Thank you!

Please send any questions to Adrian Park
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