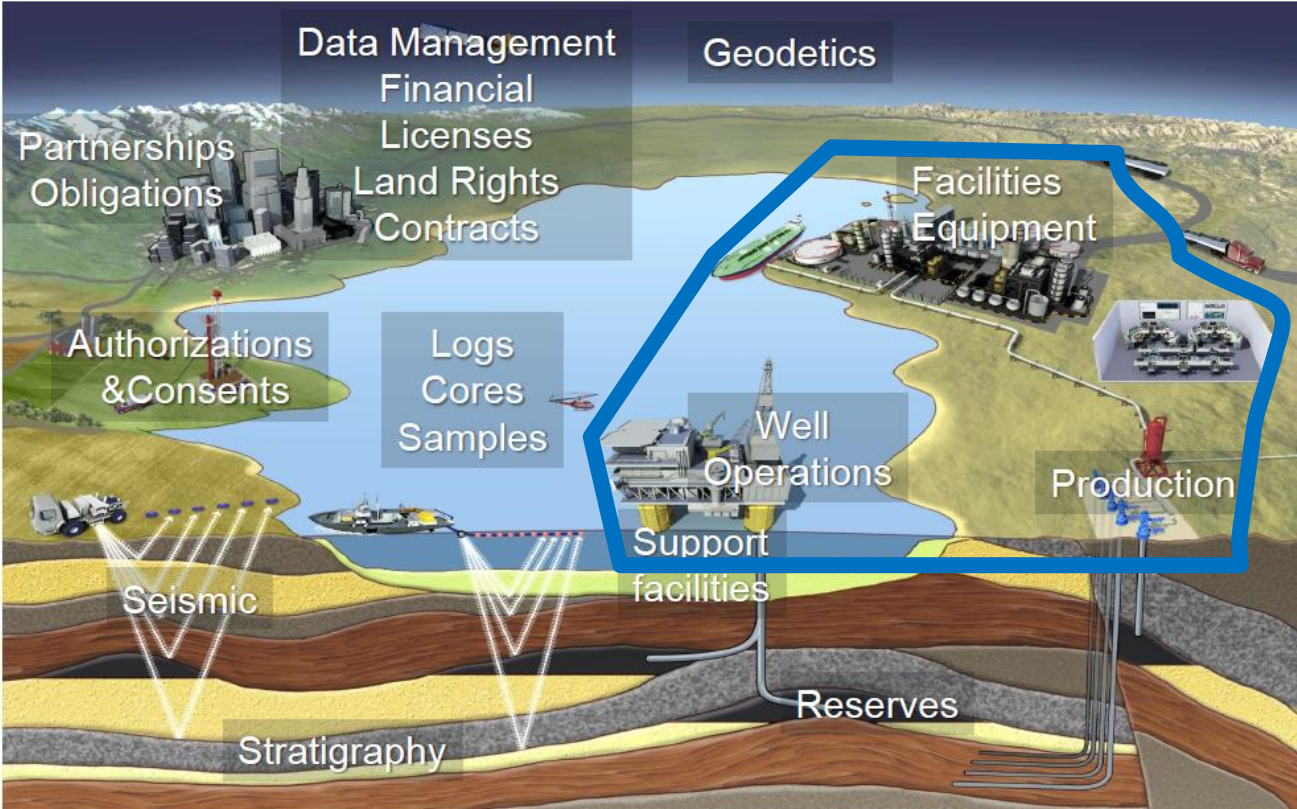# SLC Standards Leadership Council

Putting the Focus on Facilities Asset Lifecycle

Grant Hartwright

2015-03-19

- Set **context** for the **facilities asset lifecycle**

- Review some **challenges** within a **facilities asset lifecycle**

- Highlight **lessons learnt** delivering an **integrated & trusted** digital asset

Scope of the Facilities

source PPDM 3.9: 2013

Physical **Facilities** include:

- Plant
- Equipment
- Infrastructure

and the *valuable*:

Facilities Digital Asset

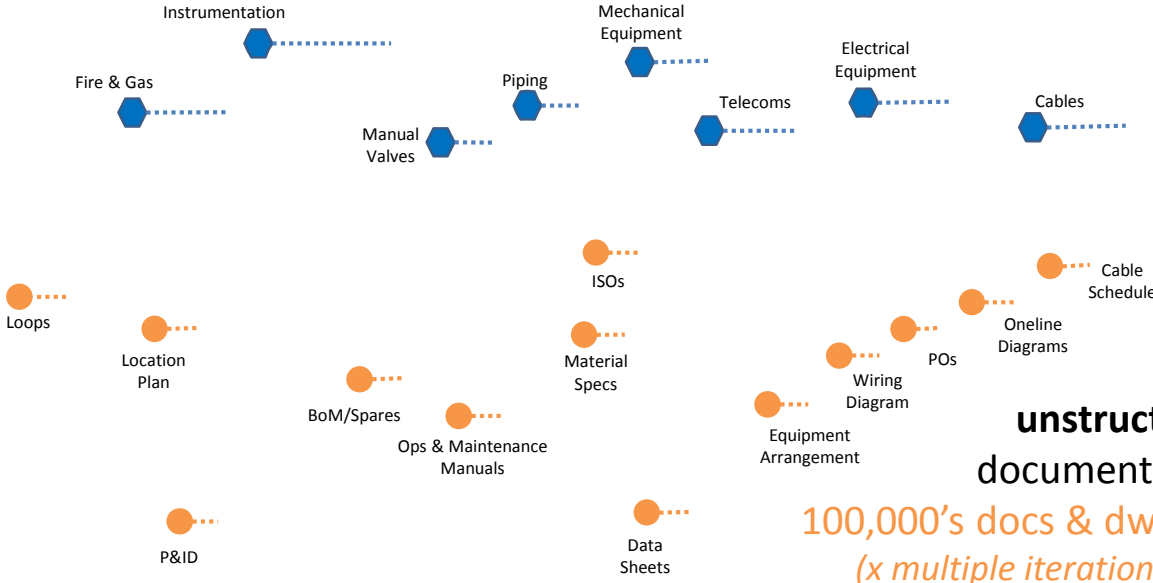- As-designed
- As-built configurations

The Digital Asset: Docs, Dwgs, Data & Models

structured data
engineering data (tags)
~100,000 tags & 1,000,000's attributes

Location

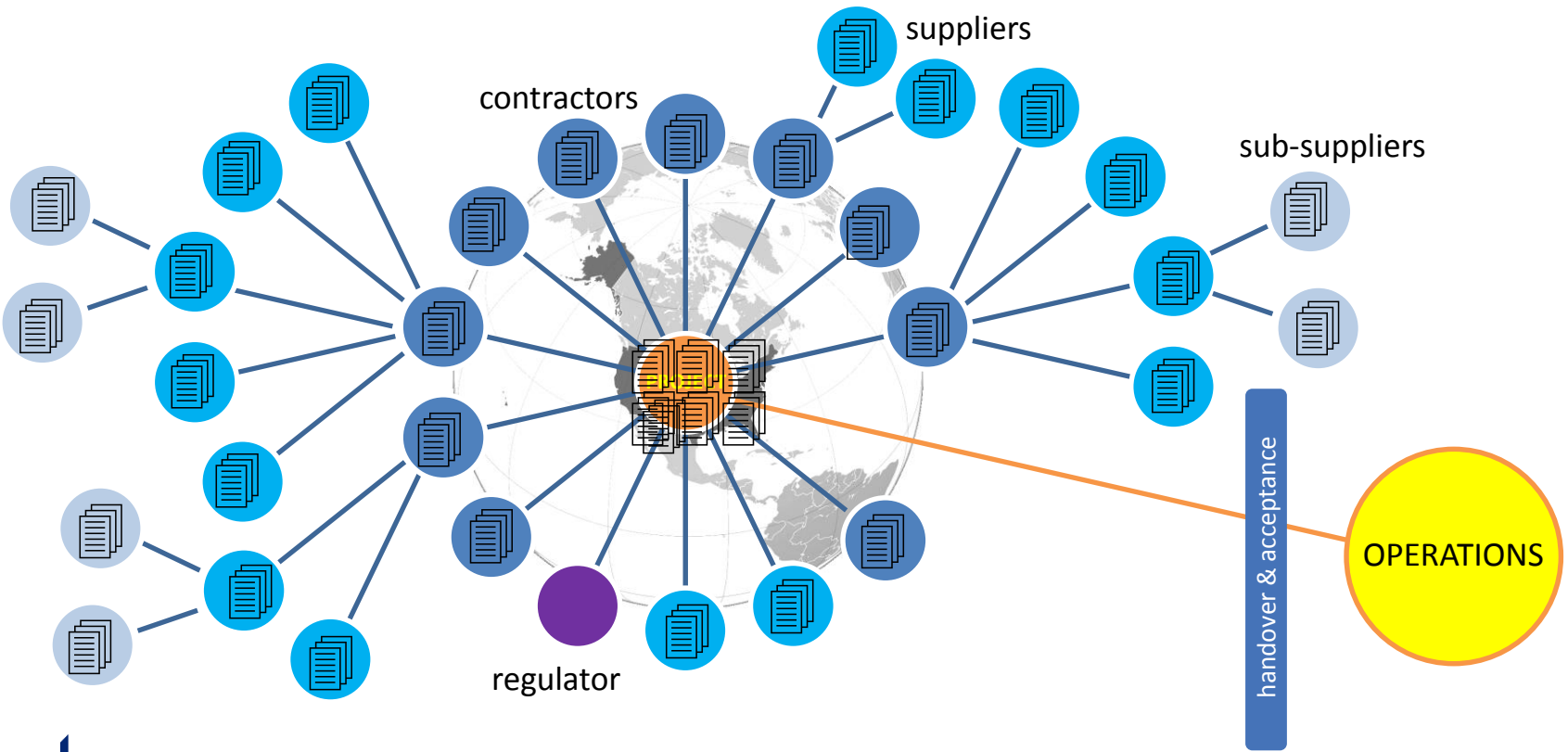Instrumentation

Fire & Gas

Mechanical Equipment

Electrical Equipment

Piping

Telecoms

Cables

Manual Valves

models
multiple file formats

ISOs

Loops

Cable Schedule

Location Plan

Oneline Diagrams

POs

Material Specs

Wiring Diagram

BoM/Spares

Ops & Maintenance Manuals

Equipment Arrangement

unstructured data
documents & drawings

P&ID

Data Sheets

100,000's docs & dwgs & associated metadata
(x multiple iterations, revisions & versions)

Transactional Activity (Project Phase of Facilities Asset Lifecycle)

suppliers

contractors

sub-suppliers

handover & acceptance

OPERATIONS

regulator

Facilities Asset Lifecycle
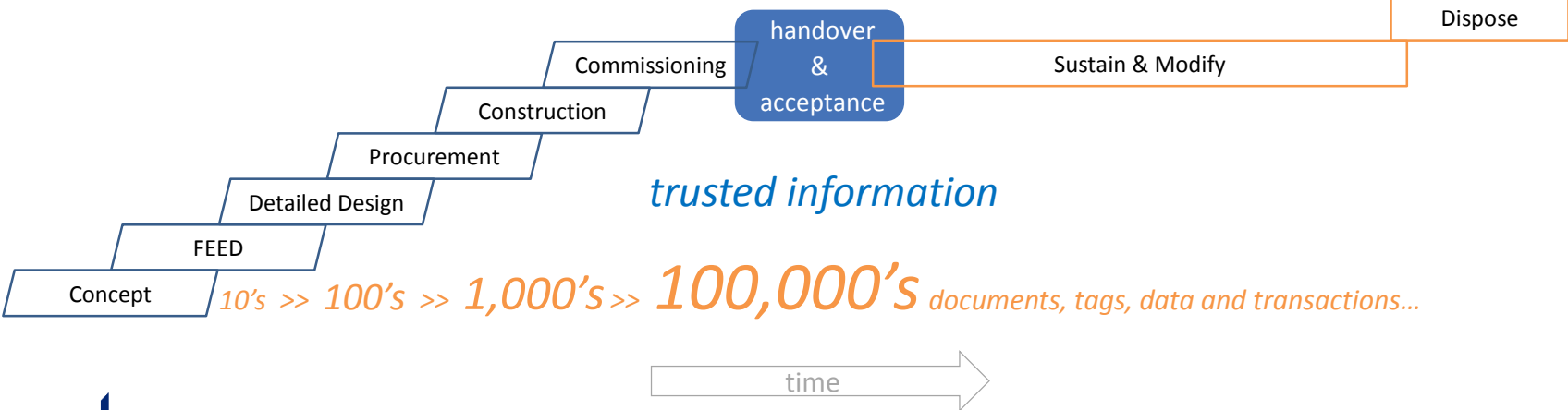
Capital Projects

Developing information to support the design, procurement and build

Operations & Maintenance

Finding information to compile maintenance work-packs, raise POs & manage concurrent modifications

finding by document#

finding by tag#

Dispose

Sustain & Modify

handover & acceptance

Commissioning

Construction

Procurement

Detailed Design

FEED

Concept

trusted information

10's >> 100's >> 1,000's >> *100,000's* *documents, tags, data and transactions...*

time

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Challenges within the Facilities Asset Lifecycle

Capital Projects	Operations & Maintenance
Digital asset *evolves* throughout 5-10yr project	Digital asset *maintained* over 20-40yrs
Content (primarily) *delivered* to project teams	Content (primarily) found by *search*
Structured data is developed in *siloes*	Structured data may be *poor quality*
Big-bang handover typical	Acceptance is often *resource constrained*
Primary objective is to *create* physical asset	Primary objective is to *sustain* physical asset
Supplier data validation – *WIIFM*?	*Just give me everything*; I'll sort it...
Searching using *document number*	Searching using *tag number*

Delivering and maintaining a trusted digital asset

Handover typically equates to:

EPC: **$1M** on a **$400M** project (e.g. **0.3%**)

O/O: an additional **$8-16M**   (e.g. **2-4%**)
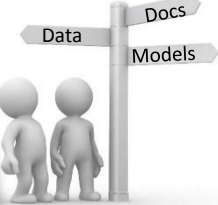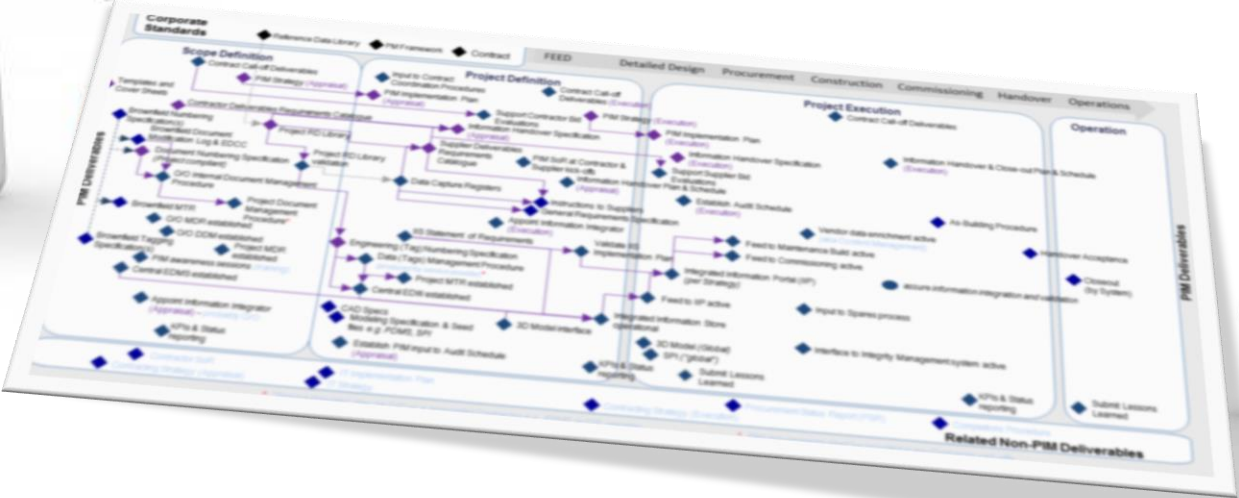
in "hidden" **data entry and validation** costs

Industrial Capital Project Plant Information Handover Best Practices Guide
Document: CP-BP001-1.00 Version 1.0 June 2012: OpenO&M (quoting FIATECH studies)

During Design, Construction and O&M:

40% of engineering time spent **finding and verifying** information

Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry, National Institute of Standards and Technology (NIST) 2004
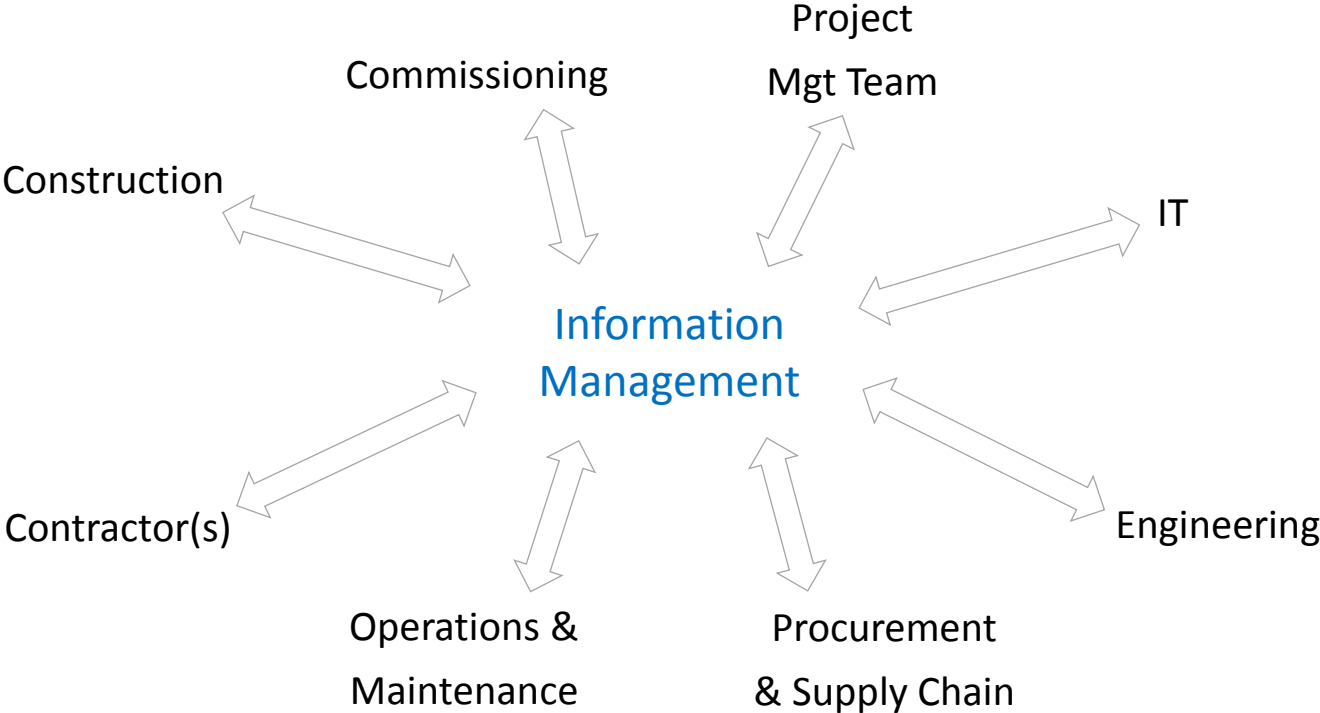
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Integrated Digital Asset Delivery Roadmap

Integrated Digital Asset Delivery Roadmap (Some Lessons Learned...)

- Develop and agree an **integrated** (Project & O&M) **IM strategy**

- Engage stakeholders early and **establish understanding** of IM role

- Establish standards & procedures early – integrate the data

- Develop a **constructive relationship** with contractors

- **Right-size** requirements & **maintain** information integrity

- Embed **systematic validation** & verification (completeness)

- Configure applications to facilitate data **consumption**

Early Engagement with key Stakeholders

Commissioning

Project Mgt Team

Construction

IT

Information Management

Contractor(s)

Engineering

Operations & Maintenance

Procurement & Supply Chain

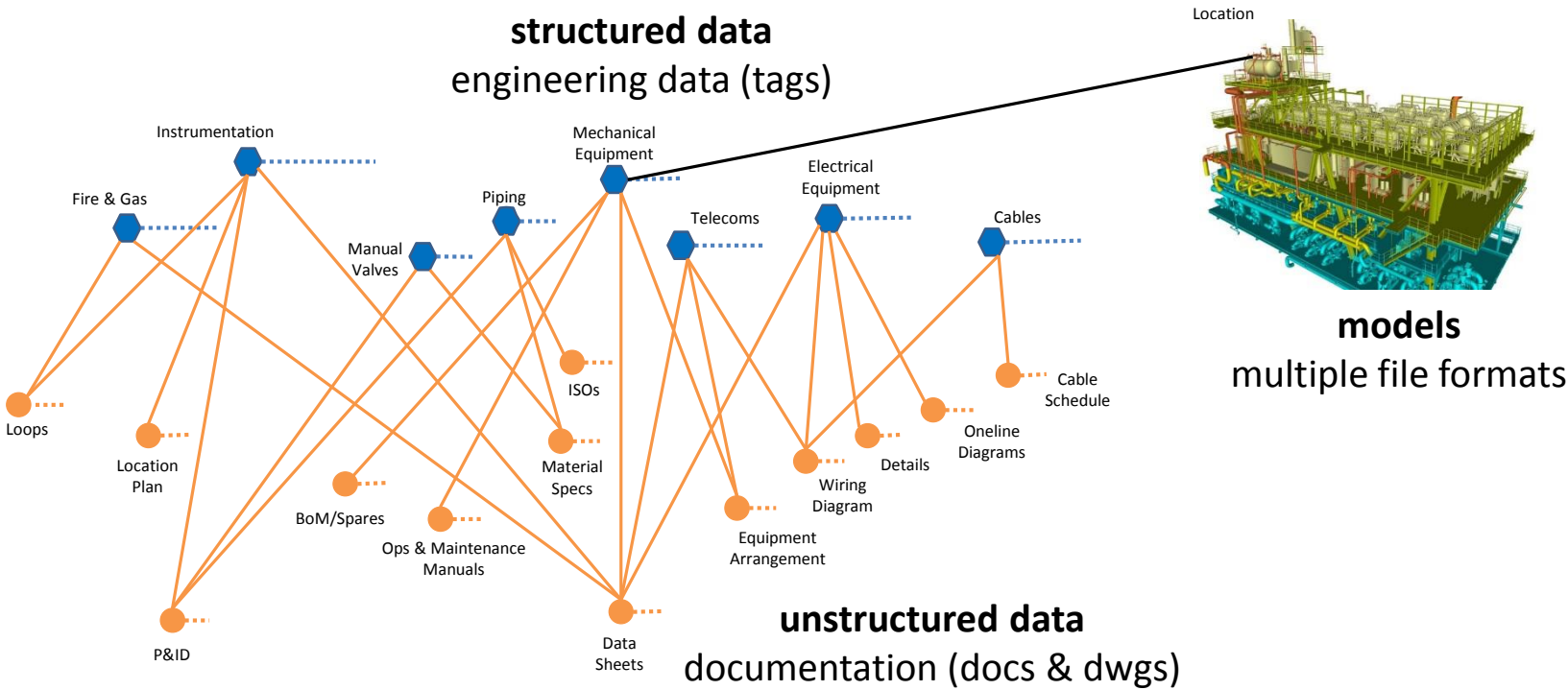# Integrated Digital Asset Delivery Roadmap (Some Lessons Learned...)

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- Configure applications to facilitate data **consumption**

Integrating the Digital Asset: Content (Structured & Unstructured)

structured data
engineering data (tags)

Location

models
multiple file formats

Instrumentation

Fire & Gas

Mechanical
Equipment

Piping

Electrical
Equipment

Telecoms

Cables

Manual
Valves

Loops

Location
Plan

ISOs

BoM/Spares

Material
Specs

Cable
Schedule

Oneline
Diagrams

Details

Wiring
Diagram

Ops & Maintenance
Manuals

Equipment
Arrangement

P&ID

Data
Sheets

unstructured data
documentation (docs & dwgs)

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Integrated Digital Asset Delivery Roadmap (Some Lessons Learned…)
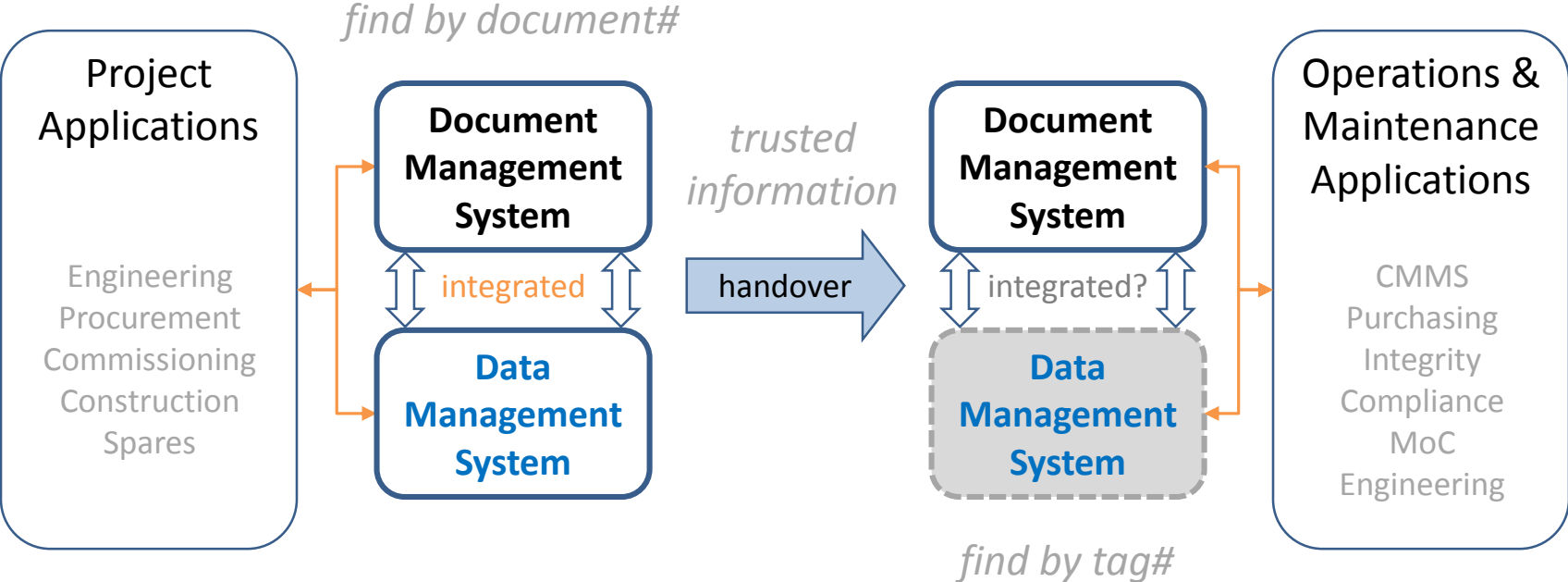
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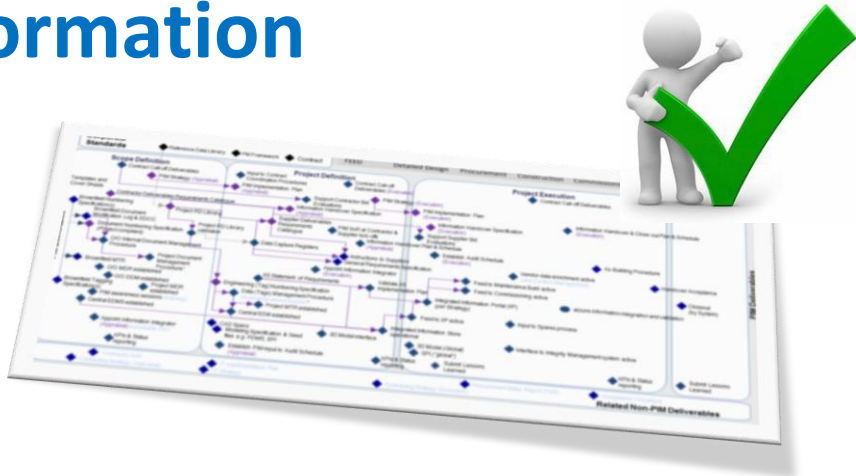- Configure applications to facilitate data **consumption**

Integrating the Digital Asset: Applications (Engineering Data Warehouse)

find by document#

Project Applications

Engineering
Procurement
Commissioning
Construction
Spares

Document Management System

integrated

Data Management System

trusted information

handover

Document Management System

integrated?

Data Management System

find by tag#

Operations & Maintenance Applications

CMMS
Purchasing
Integrity
Compliance
MoC
Engineering

Integrated Digital Asset Delivery Roadmap (Some Lessons Learned...)

- Develop and agree an **integrated** (Project & O&M) **IM strategy**

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- Configure applications to facilitate data **consumption**

An **integrated** approach to
Digital Asset management throughout the
full facilities asset lifecycle creates & maintains
trusted information

Reducing time spent **finding and verifying** information from **40%** down to **??%**

QUESTIONS?

Grant Hartwright

email:

grant.hartwright@noah-consulting.com