



Facilities



Structural



Floating -  
SIMS



Pipeline



Rotating



Instruments

## Enterprise Digital Solution for Asset Integrity Management

Speaker : Raza Amin

# Agenda



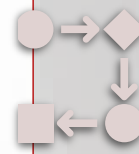
Introduction



Why Digital AIM System required?



What makes an Enterprise Digital AIM System?



Agility in an Enterprise AIM System



Recap



**Why** is an **Enterprise** Digital Asset Integrity Management System (AIMS) required?

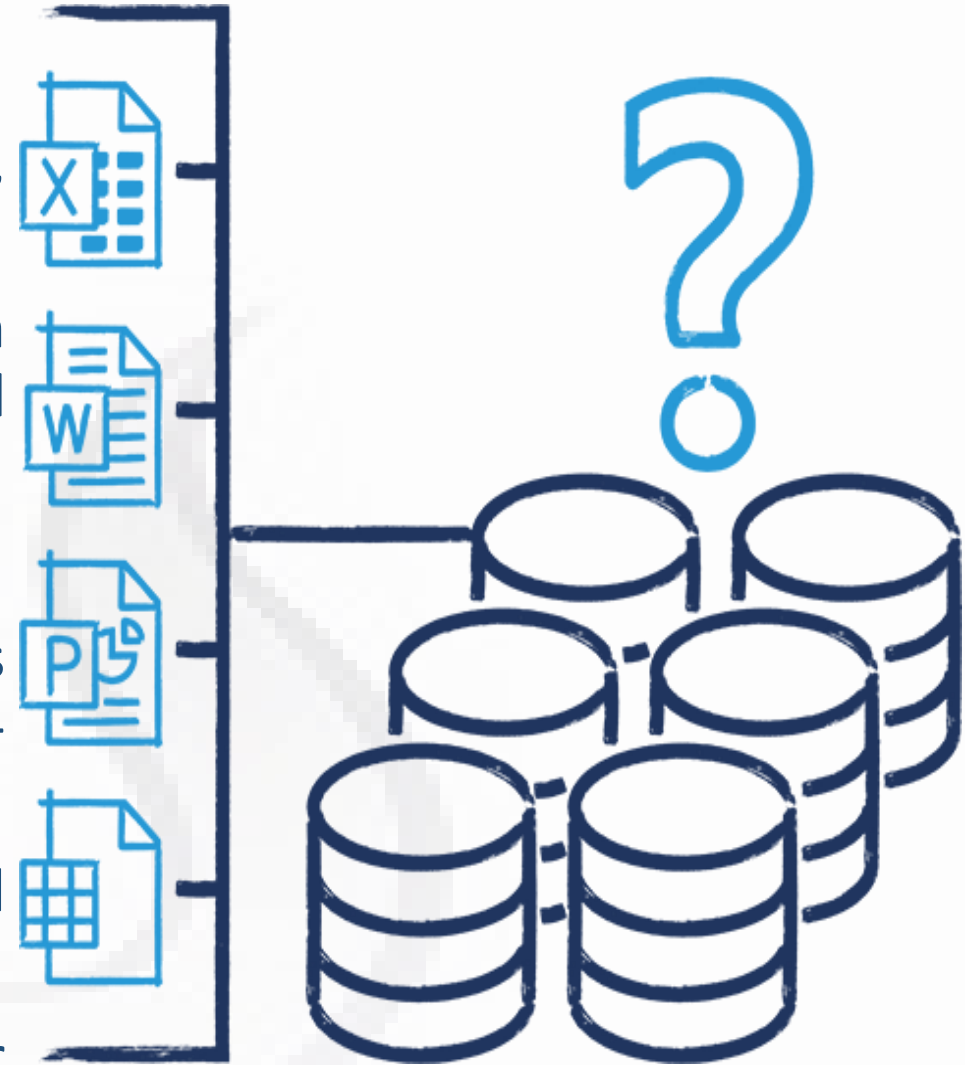
# Why Digital AIMS - Created Data Silos

## Problem

- Created too many **data silos** over years
- Different software systems for AIMS, PIMS, SIMS, IOW, FFS, IDMS, ANOMALIES etc...
- Engineers manually fetch information from each system to **make decisions** and **visualise overall health** of an asset .

## Solution

- Implement **standardised process flow** across different asset type and eliminate the data silos - don't live with the problem
- Implement the integrity solutions in **centralised digital platform**
- **Avoid and, if not, Reduce** different systems for improved efficiency



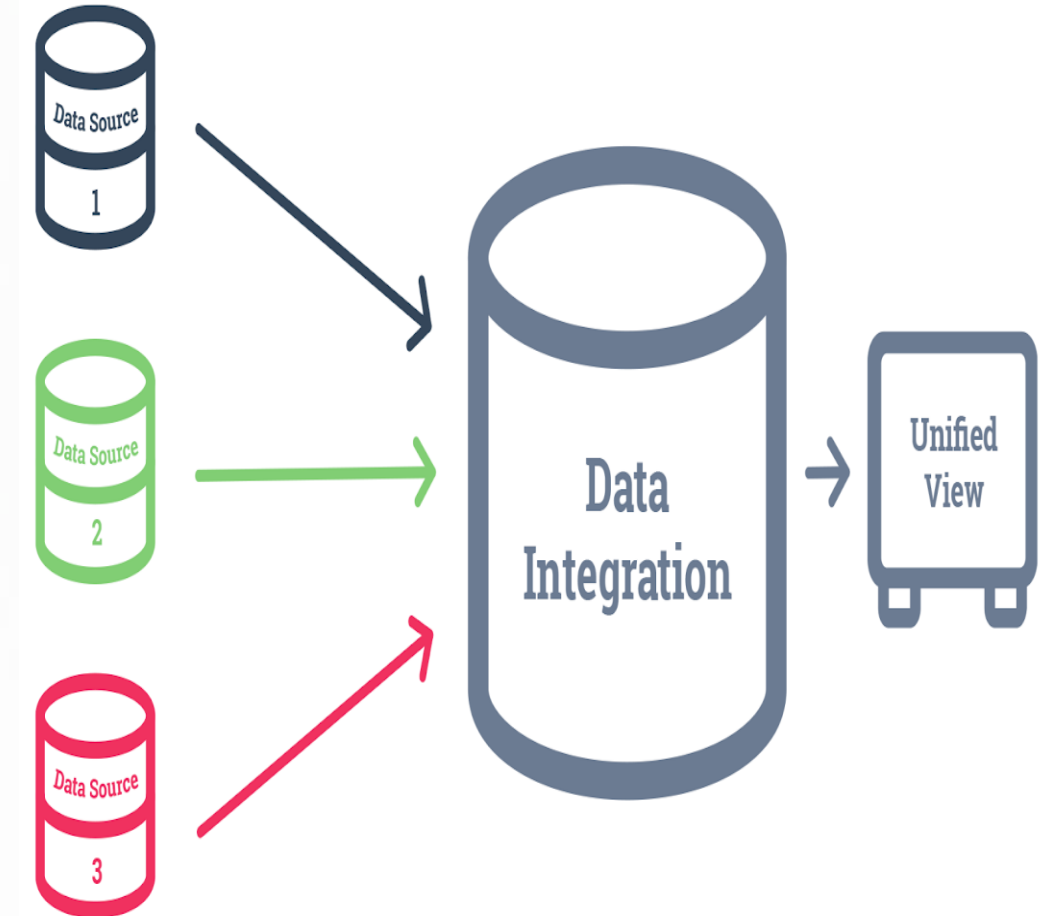
# Why Digital AIMS - Lack of Integration

## Problem

- Critical **Production / ERP systems are not integrated** like AIMS, CMMS, LIMS, PROD, SENSORS making engineers to manually fetch information from each system to make decisions.

## Solution

- Integrate each data points into centralised platform to get **valuable insights / visualisation** of the Health of an Asset.



# Why Digital AIMS - No workflow leading to Poor Accountability

## Problem

- Without a system based workflow leads to following:
  - No accountability,
  - no audit trail,
  - Unable to identify **bottlenecks** in the process,
  - Where are the **constraints** - Who missed out on an action.

## Solution

- Implement **integrated workflow** for each data points with seamless integrations
- Utilise technology to **manage accountability**
- Inform responsible party for action through **notifications**
- Generate time based **Audit trails**



1. Collaboration Enhancement
2. Compliance Improvement
3. Better Transparency
4. Cost Reduction
5. Error Decrease
6. Accountability Increase
7. Process Adherence
8. Automation Opportunities
9. Scalability Raise

# Why Digital AIMS - Duplication of data / process / efforts

## Problem

- **Multiple contractors** managing various Integrity, inspection and reporting activities for different asset types with **inconsistency in reporting**.
- **Difficulty in inspection planning** that is time consuming leading to too many **overdue actions**
- Same process done in different systems, hard to maintain multiple systems to improve processes

## Solution

- **Improve the interface** between different parties by **centralizing and sharing information**.
- **Common platform** for work packs
- Inspection **reporting directly in the platform**
- Reduce Errors, perform QA/QC



**DUPLICATE  
CONTENT**

# Why Digital AIMS - Data Security and Storage issues

## Problem

- Data Security
- Scattered Data Storage
- Unable to share data to users

## Solution

- Data centralizing and sharing information.
- Common platform for data storage
- Security as per company policy





# Why Digital AIMS - Information / Data Transparency

## Problem

- Traditionally data is collected in a **report** format often **not available** for decision making
- Information derived is **not available** in **structured data** format
- Lack of data analytics

## Solution

- Data centralizing
- Store, classify and prepare data centrally
- Common platform for producing data analytics



**What** makes an Enterprise Digital Asset Integrity System?

# What is an Enterprise AIMS System?

## IT Governance

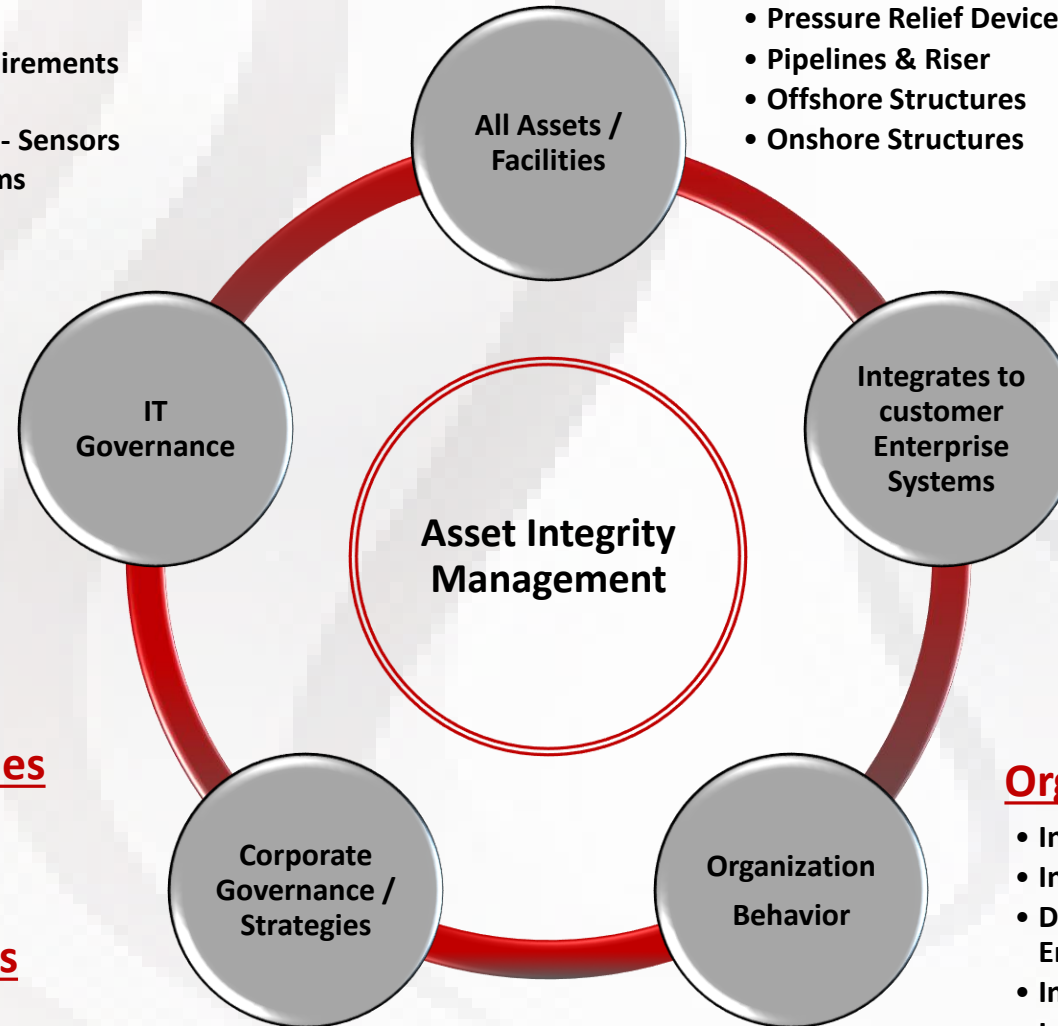
- ISO & Other Compliances
- Infrastructure Planning and Requirements
- Data Centralization
- Real time information streaming - Sensors
- Integration with corporate systems
- Security of profiles and systems

## Assets Categories

- Piping
- Pressure Vessels
- Pressure Relief Devices
- Pipelines & Riser
- Offshore Structures
- Onshore Structures
- Rotating Equipment
- Instrumentation
- Electrical
- Lifting Equipment
- Safety Systems
- Well

## Live Data Acquisition and Processing

- CMMS
- LIMS,
- Production system,
- Integrity Sensors
- ERP



## Corporate Level Strategies

- Building AIM Strategies
- Roll out of strategies
- Compliances

## Business Level Strategies

- Asset Performance Management
- KPI & Dashboard

Functional Level Strategies

## Organizational Behavior

- Integrity Managers
- Integrity Engineers
- Discipline Engineers
- Inspectors
- Inspection Engineers
- RBI Engineers
- RCM Facilitators
- SIL Facilitators
- Data Processors
- Maintenance Planners
- Drafts man

# Enterprise AIMS Framework

## AIMS Dashboard



Facilities Integrity



Structural Integrity



Floating-SIMS Integrity



Pipeline Integrity

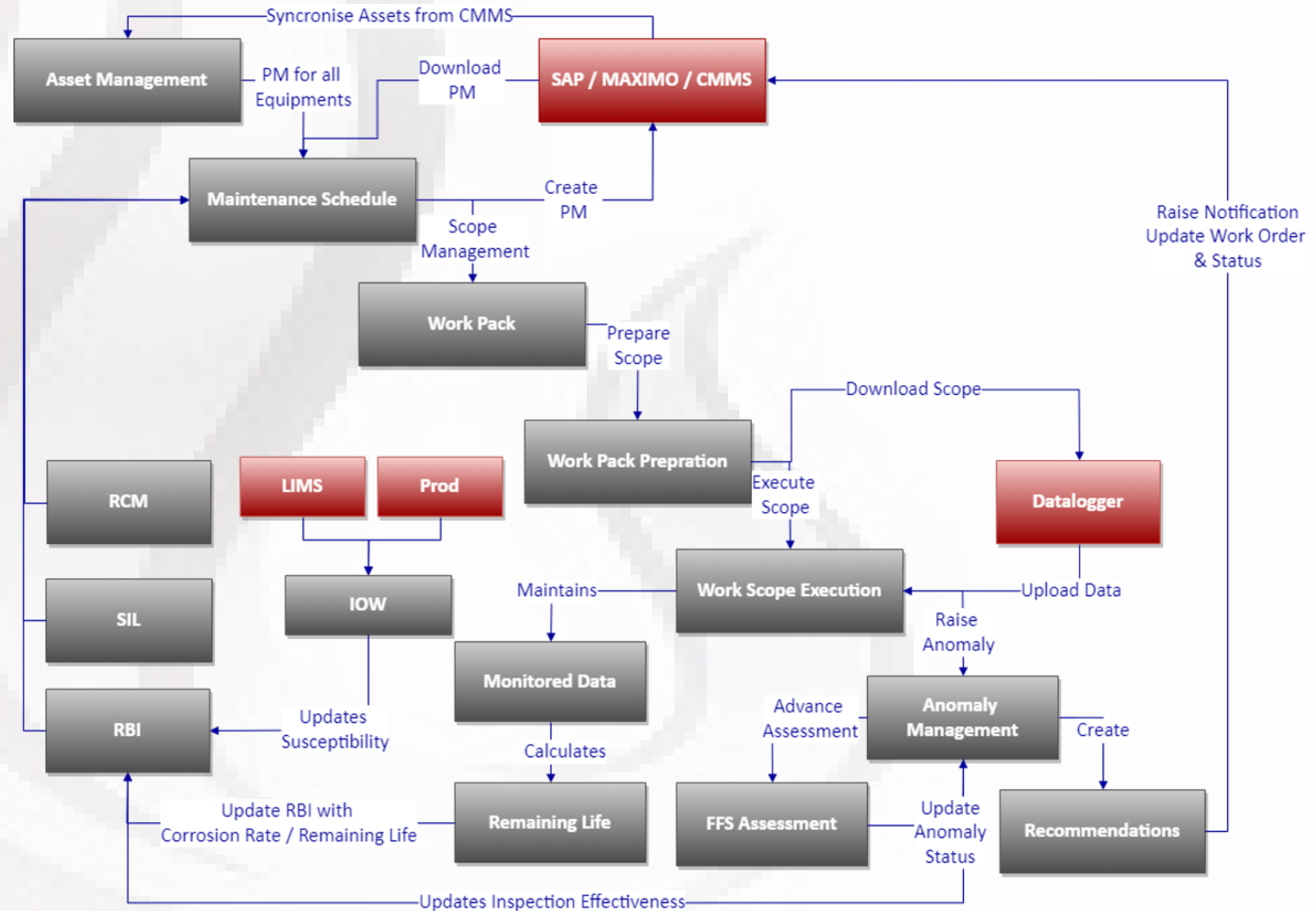


Rotating RCM



Instrumentation SIL

## AIMS Framework





# Agility in an Enterprise Asset Integrity Management System (AIMS)

# Agility requires robust and adaptive **Digital Platform**

A modern and comprehensive cloud based database application platform. Prototype, Build, Test and Deploy your application in lightening speed.



## Accessible thru Mobile

Access your application from anywhere using your mobile devices, get notification of work anywhere



## Easy to use

Simple design, very intuitive for navigating through the application screens and modules



## Workflow

Manage and configure your workflow, with emails and screen notification services. End user can manage their operational changes easily following the workflow system



## Cloud

Build your fully cloud ready applications, you can easily deploy into any cloud platform



## No Code

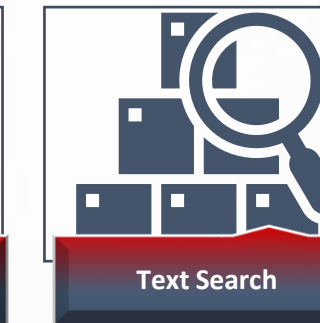
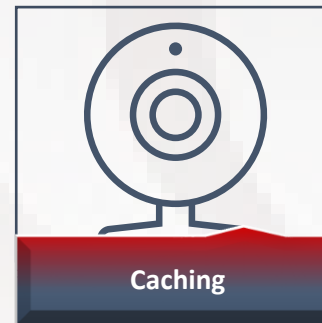
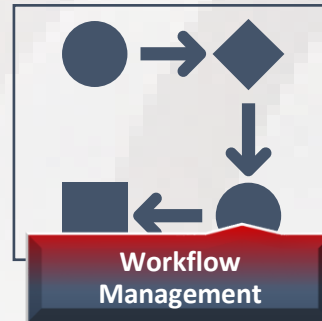
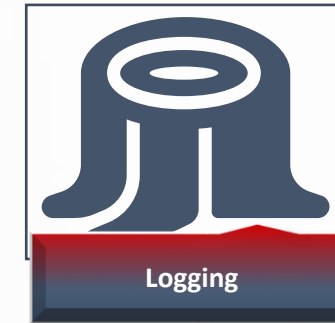
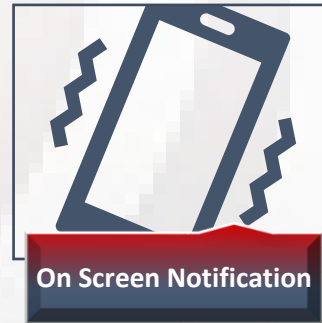
Anyone can build online database applications ultra fast without coding. All-in-one cloud platform makes it easy to build custom database applications in a fraction of the time and cost versus traditional software development



## Easy to Configure

Configure your requirements in minutes, prototype it, and build, test and deploy into production easily without much of efforts

# Digital Platform - Infrastructure





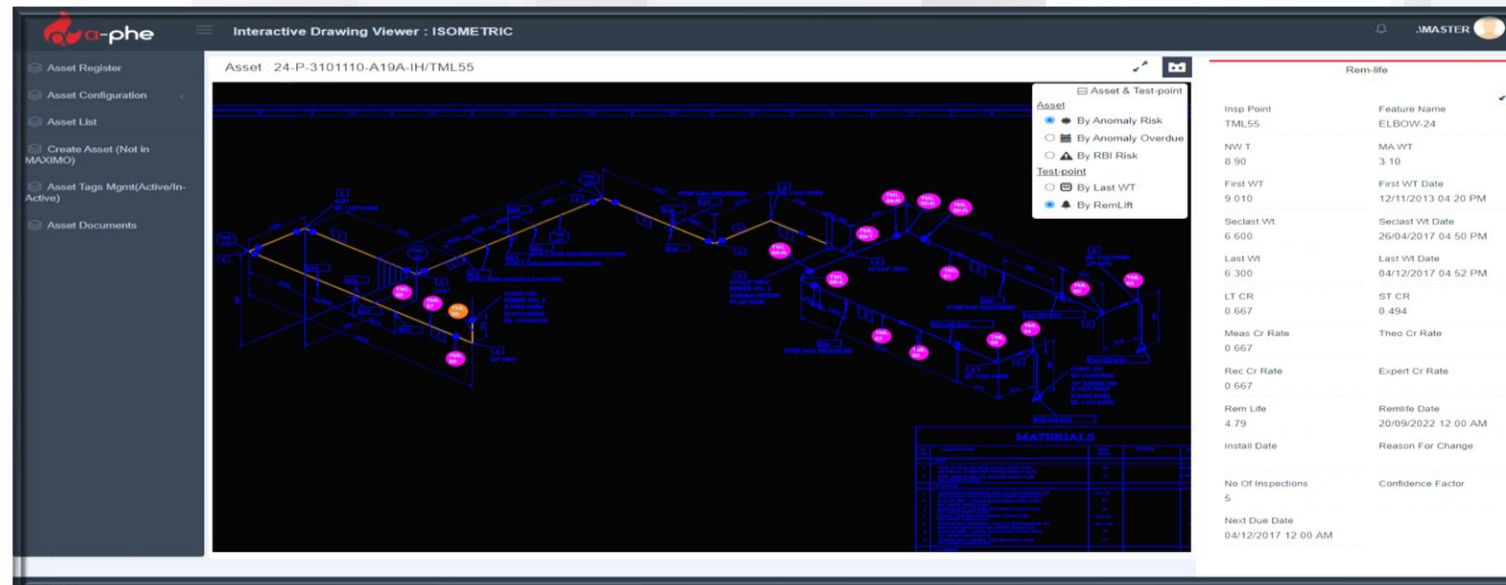
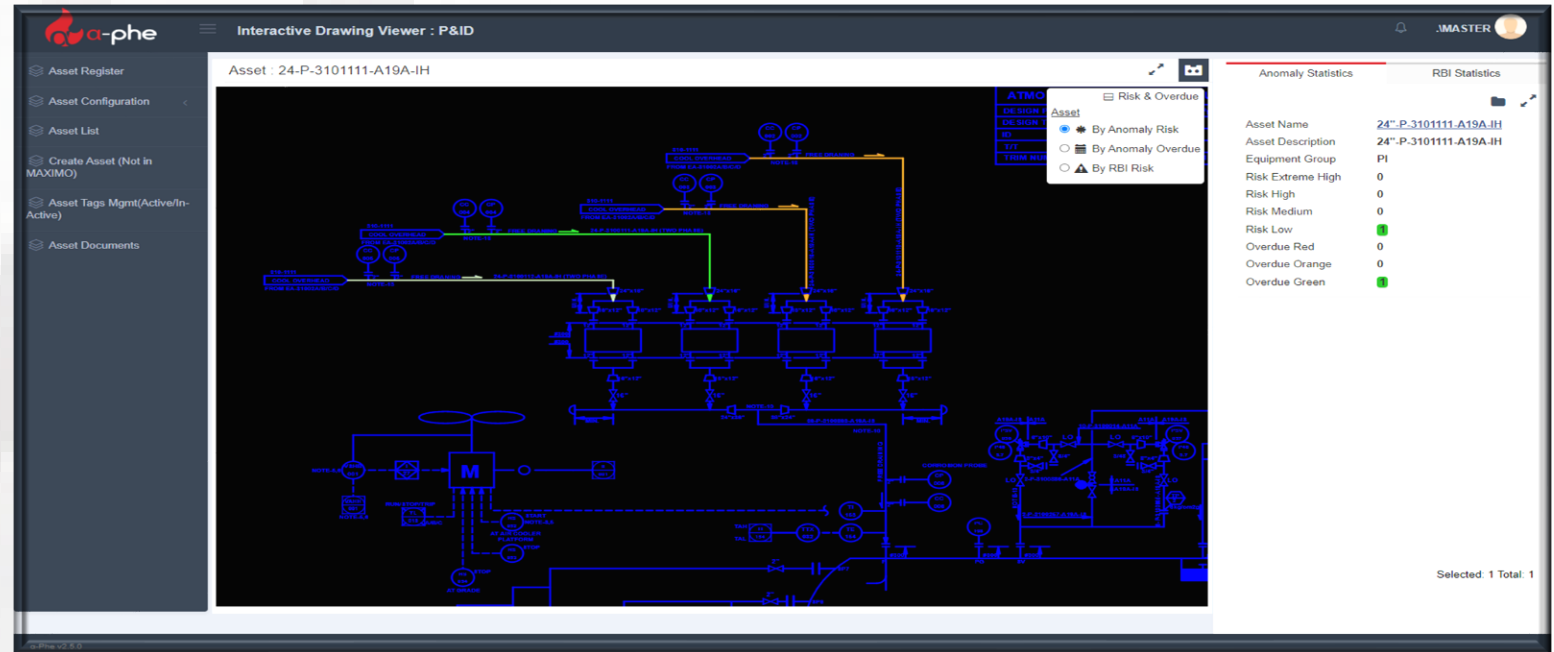
# Digital Platform - Dashboards

- Dashboard customised to operations needs
- Dynamic dashboards for trouble shooting



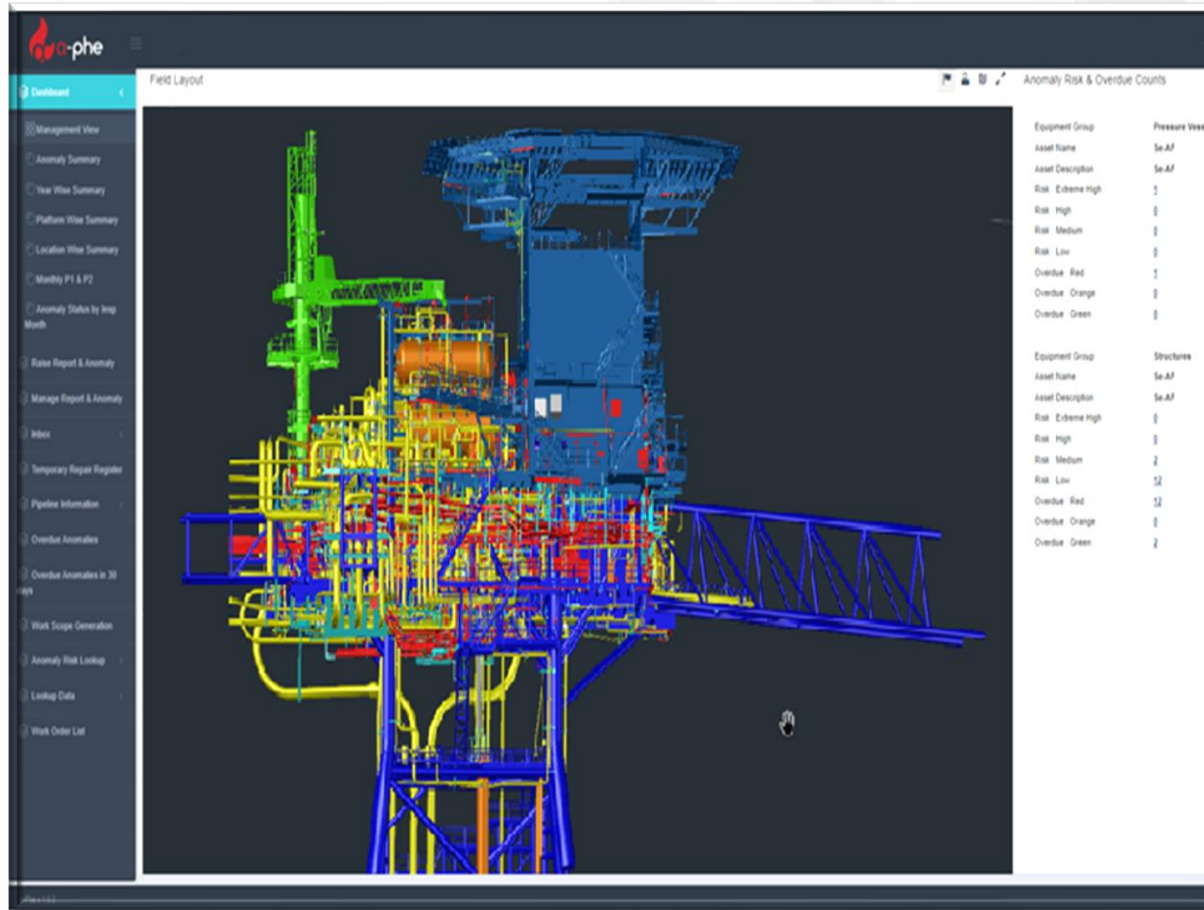
# Digital Platform - Smart Drawings – P&ID & Isometric Color Coding

- Showing Status in drawings
  - By RBI risk
  - By Anomaly Risk
  - By Anomaly Overdue
  - Wall thickness data
  - Remaining Life



- Colour coded drawings by
  - Risk,
  - Overdue
  - Rem. life
- Navigate / drill down
  - Assets details
  - Anomalies
  - RBI
  - Other modules

# Digital Platform - AIM Digital Twin



AIM digital twin :

- Dynamic Screens
- Each number crunching status is interactive and provides integrity data drill down capabilities



# Digital Platform - Barrier Management Visualisation

v4.1.0
Barrier Management > BM MAH Register
MASTER

MAH Register 8

[+ Create](#)
[Refresh](#)
[Export](#)

| Action | MAH Code | MAH Name                 | MAH Description          | MAH Top Event       |
|--------|----------|--------------------------|--------------------------|---------------------|
| ...    | 01.01    | Crude Oil Under Pressure | Crude Oil Under Pressure | Loss of Containment |
| ...    | 01.02    | Hydrocarbon in For...    |                          |                     |
| ...    | 01.06    | Hydrocarbon Gas          |                          |                     |
| ...    | 06.03    | Overhead Equipmen...     |                          |                     |
| ...    | 08.01    | On Water Transport       |                          |                     |
| ...    | 08.02    | In Air Transport (Fly... |                          |                     |
| ...    | 08.03    | Boat Collision Haza...   |                          |                     |
| ...    | 08.07    | Transfer from Boat       |                          |                     |

**Bow Tie Document 1**

[Refresh](#)
[Export](#)
[View Bow Tie Diagram](#)

Doc No

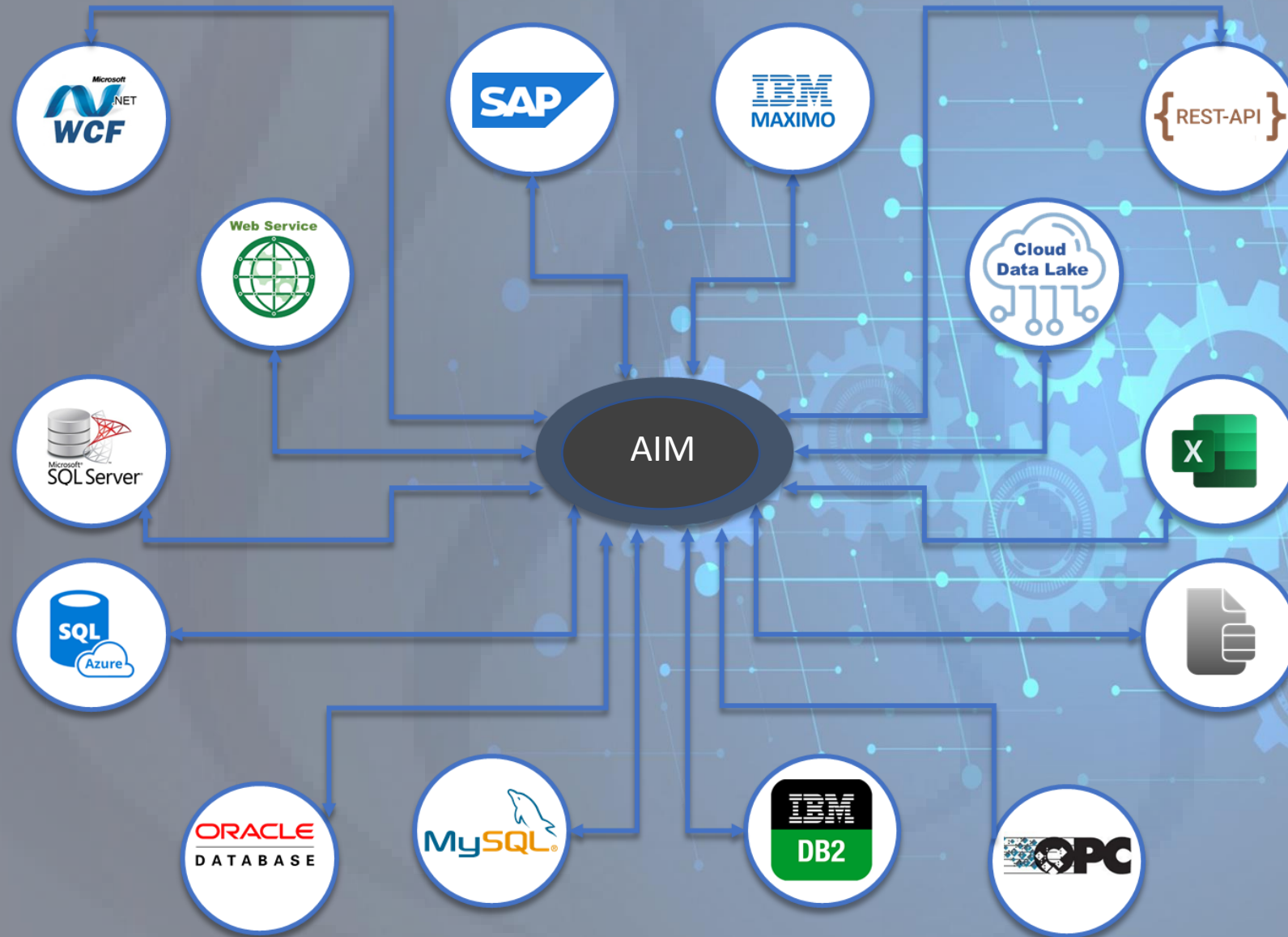
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v4.1.0
Barrier Management > Bow Tie View
MASTER

**Bow Tie View**

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# Digital Platform – System Integration

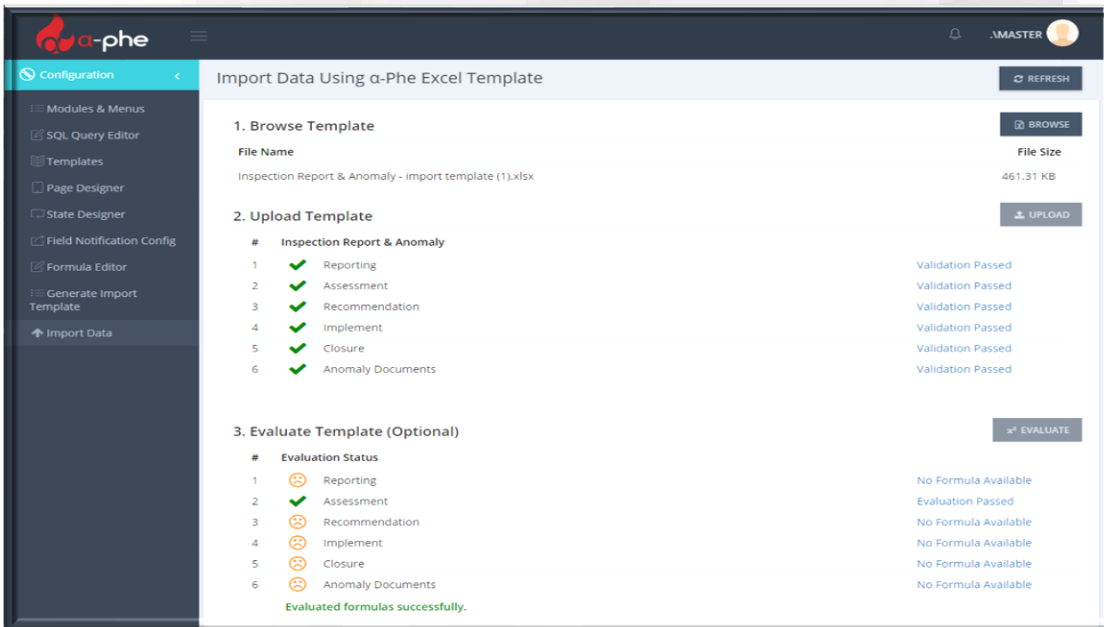
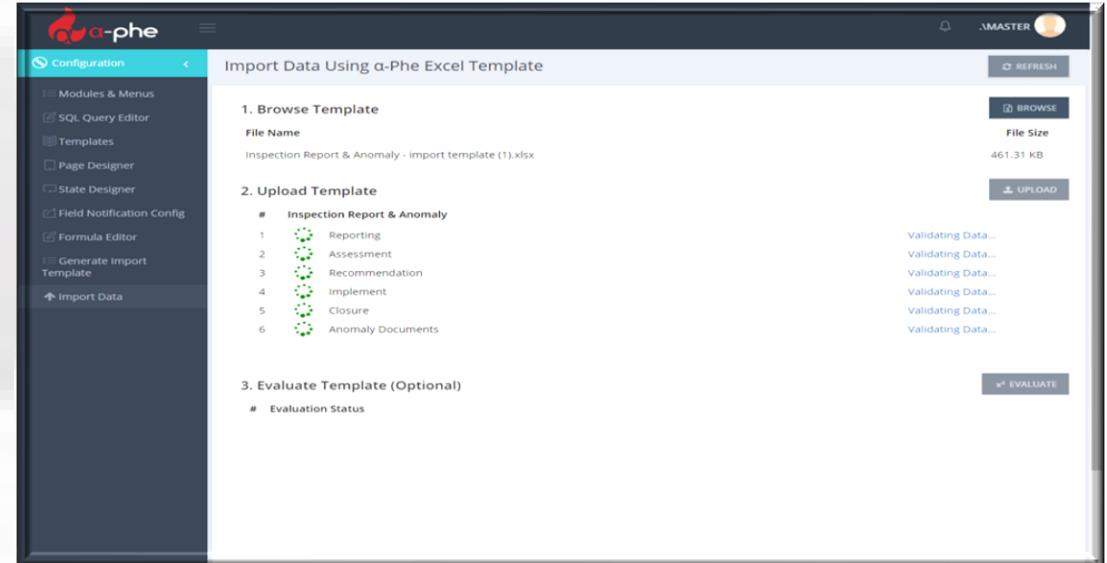


# Integration Areas

| Integration Systems                                  | Integration Area   |
|--|--|
| CMMS (SAP / MAXIMO / Oracle E-Business Suite/Etc...) | Asset Synchronisation from CMMS                                      |
|  | Download Preventative Maintenance / Inspection Plans                 |
|  | Update Preventative Maintenance / Inspection Plans in CMMS           |
|  | Anomaly Corrective Maintenance Work Request / Work Order             |
| Production Systems (OSISoft PI, Exa-Quantum etc...)  | Synchronise daily production data flow, temperature, pressure etc... |
| Laboratory Information Systems (LIMS)                | Synchronise periodic lab tested data ph, co2, etc...                 |
| UT Datalogger  | Download Ultrasonic Wall Thickness Work scope to datalogger          |
|  | Upload Ultrasonic Wall Thickness data from datalogger                |

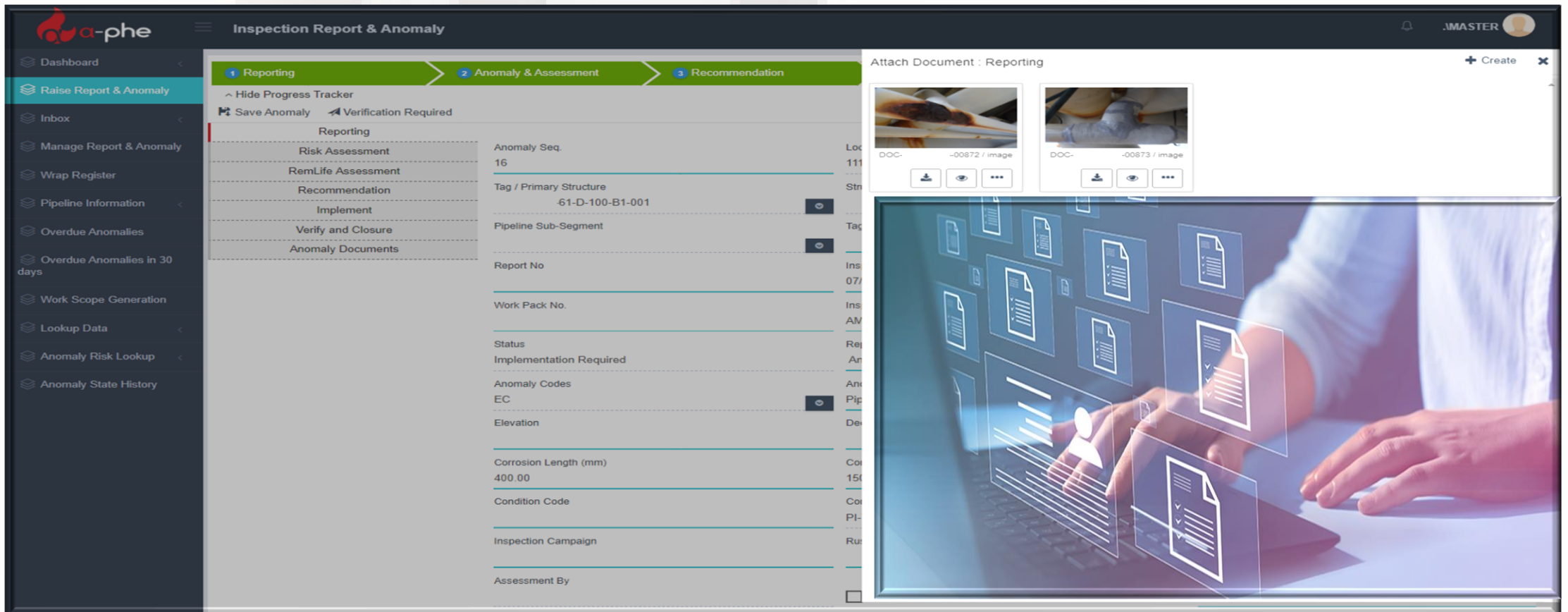
# Digital Platform - Export / Import Facilities

- ✓ Export into excel file
- ✓ Import excel template is generated
- ✓ Validation of data
- ✓ Auto calculate the necessary fields



# Digital Platform - Document Management

- Each section stores documents
- Visualise the pictures
- Attach multiple documents
- Compress for faster visualisation
- Manage original file size to keep high resolution
- Categorisation of documents
- Drag and drop facility

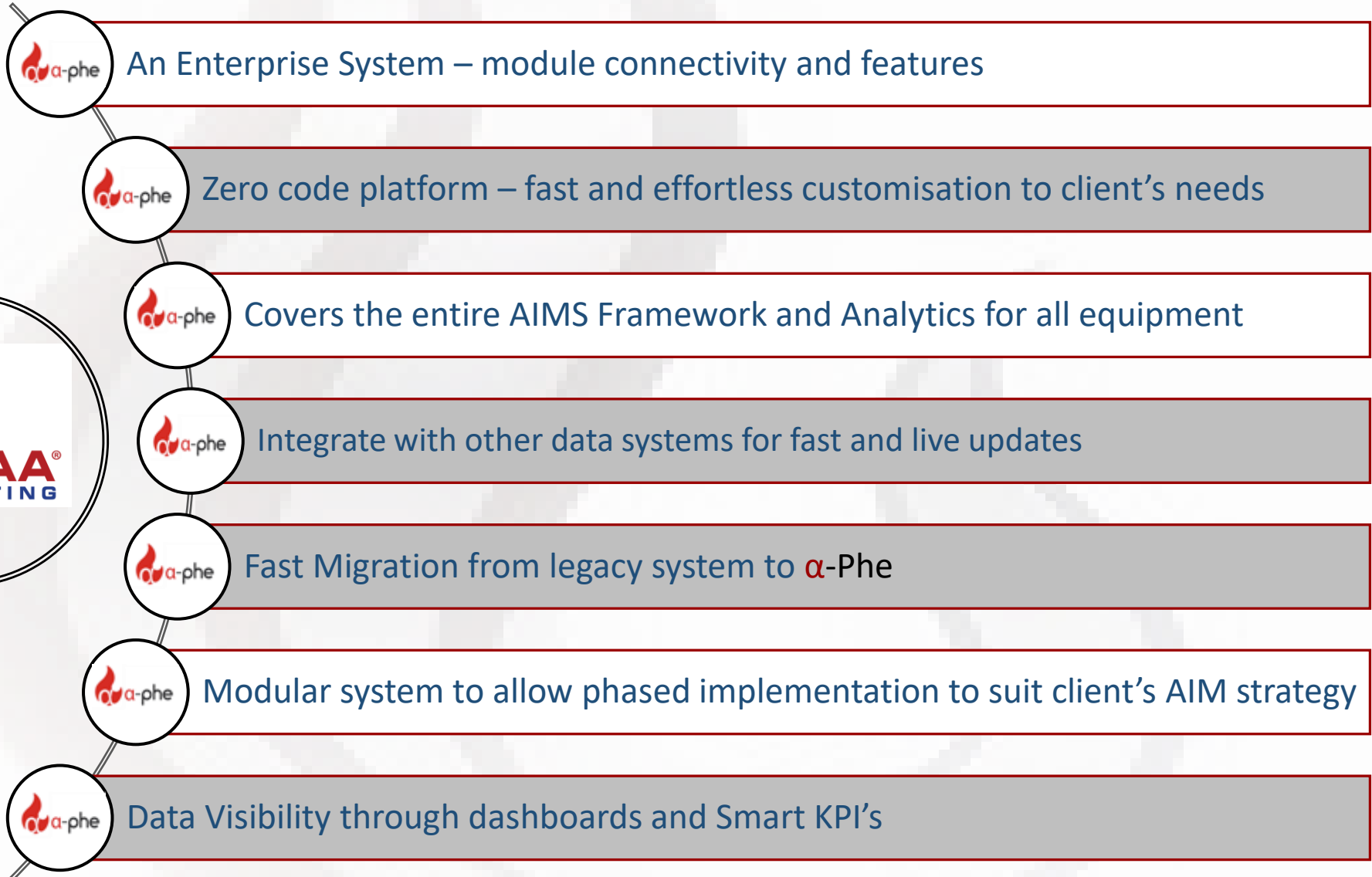




# Asset Integrity (AI) Risk Analytic Models

- **RBI for Static Equipment - API 581**
  - Static Equipment
  - PRD
- **Onshore**
  - RBI for Onshore Pipeline – B31.8S
  - RBI for Onshore Structures
- **Offshore**
  - RBI for Offshore Pipeline – DNV F116, B31.8S
  - RBI for Offshore Structures – API RP 2SIMS
  - RBI for Rigid Riser
  - RBI for Flexible Riser
  - RBI for Flexible Pipeline
  - RBI for Mid-Water Arch (WMA)
- RBI for FPSO Hull
- RBI for Mooring Systems
- **RCM** - SAE JA 1011-1012, ISO 14224
- **SIL** - IEC 61508 and IEC 61511
- **FFS** - API 579
- **IOW** - API 584
- **Special Component**
  - RBI for Lifting Equipment
  - Dead leg,
  - Small Bore,
  - Mixing Point,
  - PP, CUI,
  - Check Valve,
  - Flange Management

# Why an Enterprise AIMS Digital Platform?



# Thank You!



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