Understanding the Asset Management Foundation

Bouke Spoelstra: Senior Sales Lead, Cohesive Africa

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The Aim of Day 2:

Problem Statement:

The challenge in levering AI for Predictive Maintenance, to advance maintenance strategies, is the availability and quality of baseline data from Enterprise Asset Management Systems
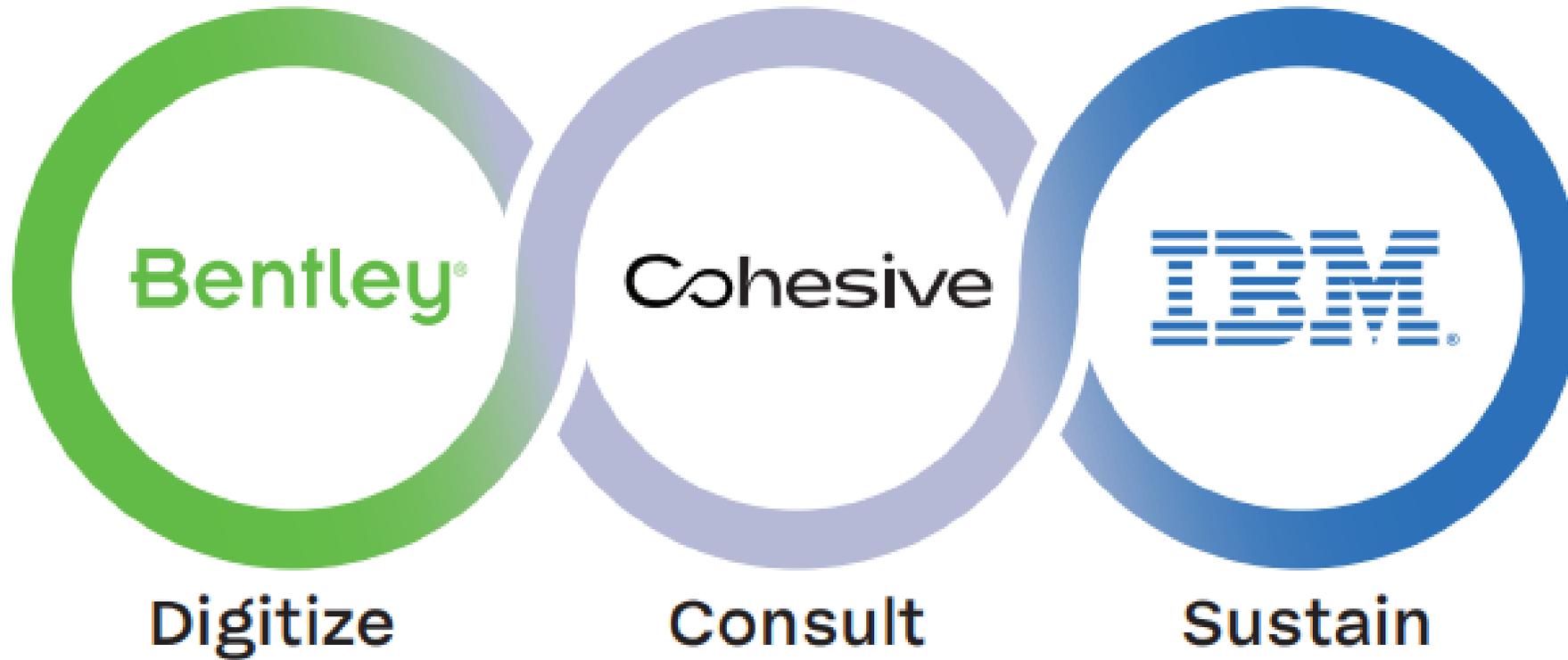
Mission Statement

Cohesive aim to demonstrate how the systematic implementation of ISO standards provides a roadmap to an ideal data baseline to support operations and future analytics
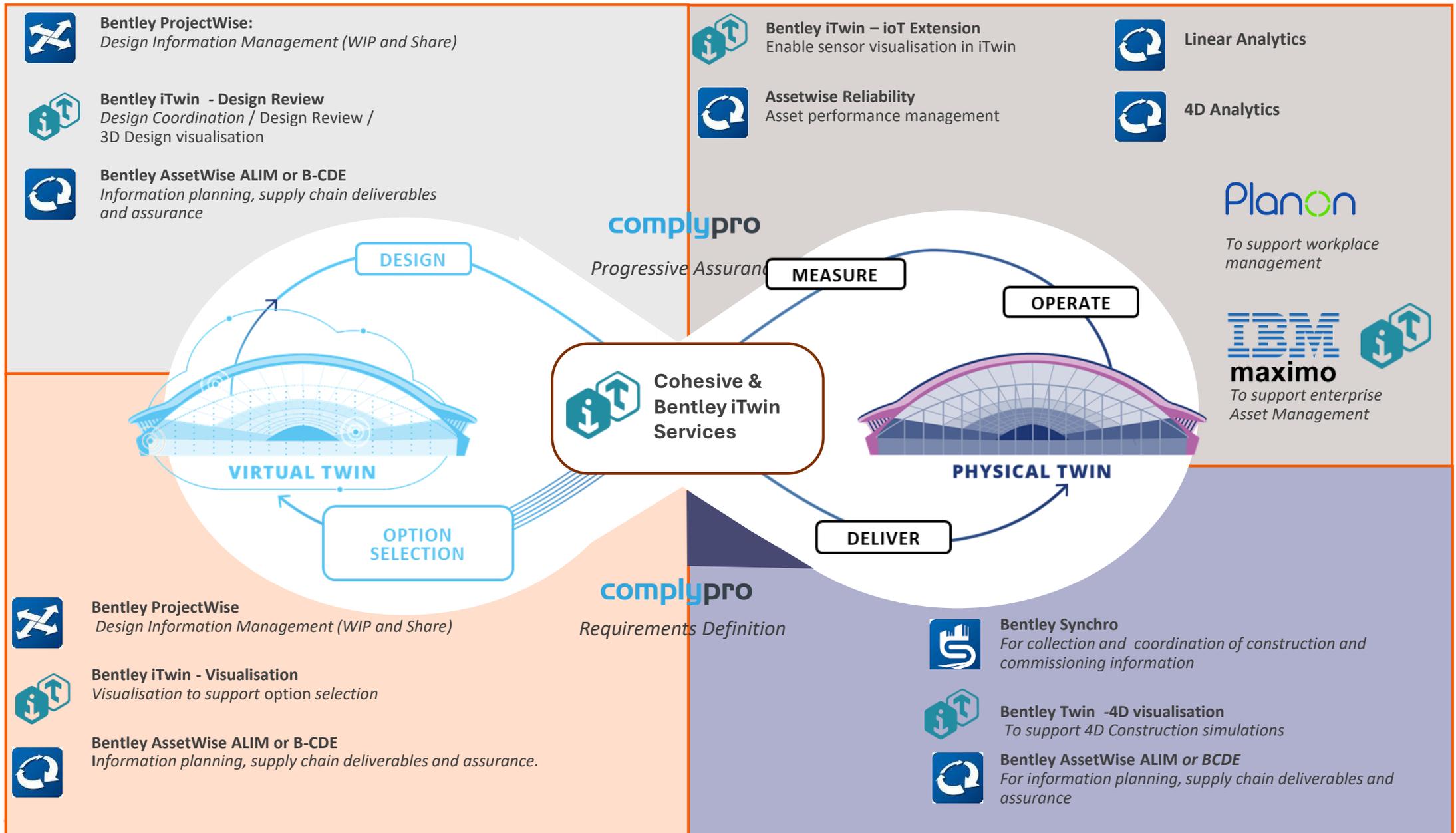
"What do we do Monday at 8h00"

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About Cohesive

Cohesive

The Cohesive Partner Network in Asset Management

Bentley — Digitize

Cohesive — Consult

IBM — Sustain

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Bentley: The Infrastructure Engineering Software Company

Bentley ProjectWise:
Design Information Management (WIP and Share)

Bentley iTwin - Design Review
Design Coordination / Design Review /
3D Design visualisation

Bentley AssetWise ALIM or B-CDE
*Information planning, supply chain deliverables
and assurance*

Bentley iTwin – ioT Extension
Enable sensor visualisation in iTwin

Linear Analytics

Assetwise Reliability
Asset performance management

4D Analytics

Planon

*To support workplace
management*

IBM maximo
*To support enterprise
Asset Management*

complypro

Progressive Assurance

DESIGN

MEASURE

OPERATE

Cohesive &
Bentley iTwin
Services

VIRTUAL TWIN

PHYSICAL TWIN

OPTION
SELECTION

DELIVER

complypro

Requirements Definition

Bentley ProjectWise
Design Information Management (WIP and Share)

Bentley iTwin - Visualisation
Visualisation to support option *selection*

Bentley AssetWise ALIM or B-CDE
Information planning, supply chain deliverables and assurance.

Bentley Synchro
*For collection and coordination of construction and
commissioning information*

Bentley Twin -4D visualisation
To support 4D Construction simulations

Bentley AssetWise ALIM *or BCDE*
*For information planning, supply chain deliverables and
assurance*

What does Cohesive do

Asset Management Advisory Services (AMA)
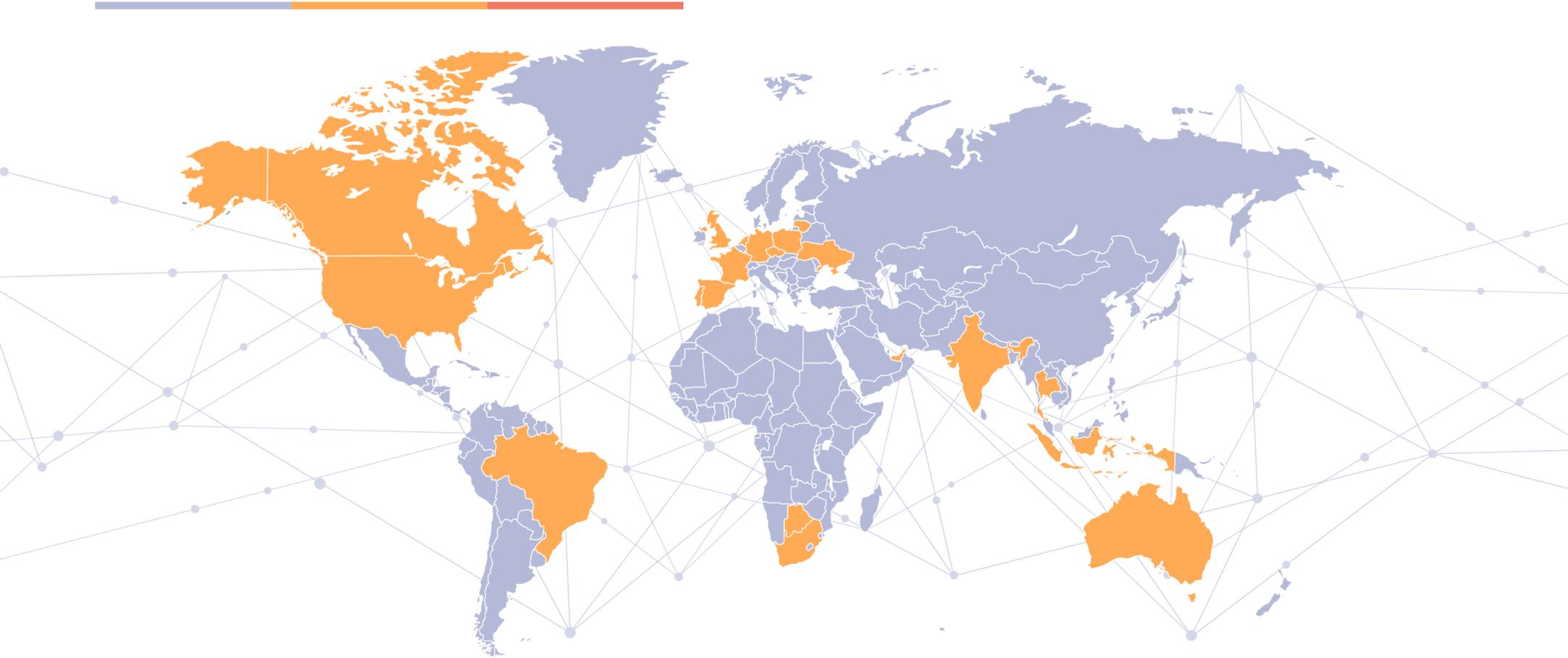
Enterprise Asset Management Solutions (EAM)

Facility Management Solutions (IWMS)

We are an end-to-end solutions provider in the field of Asset Management. Of particular importance to this proposal, we are also Institute of Asset Management (IAM) endorsed assessors.

For more information about the services offered by our Asset Management Advisory (AMA) division, please visit our website via the following *link*.

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Cohesive: Strength in Numbers

Over **700** colleagues globally

North America	South America	Europe		Africa	Asia	Oceania
USA	Brazil	UK	Germany	Botswana	UAE	Australia
Canada		Netherlands	Poland	South Africa	India	
		France	Lithuania		Malaysia	
		Portugal	Ukraine		Indonesia	
		Spain	Czech Republic			

Enabling Excellence with Asset Performance Services

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8

How We Help

Delivering services that unlock asset performance excellence.

Advisory

Providing expert guidance and support to help you develop and implement effective asset management strategies, optimize your operations, and maximize your ROI.

Implementation

Helping you implement and deploy leading enterprise asset management (EAM) and facilities management solutions, ensuring a smooth transition and optimal system configuration.

Hosting

Providing secure and reliable hosting services for your EAM and facilities management solutions, ensuring your systems are always available and performing at their best.

Data Services

Helping you manage, protect, and get the most out of your data. Our data services include everything from data migration and integration to data quality management and advanced analytics.

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Industries We Serve

Energy

- Oil & Gas
- Utilities (Electric, Gas, Water)
- Nuclear
- Renewables (Solar, Wind, Hydro)

Powering the world with reliable and sustainable energy solutions.

Transportation

- Rail & Metro
- Aviation
- Road & Highways
- Marine & Waterways

Enabling smarter, safer, and more sustainable transportation networks globally.

Industrial Operations

- Mining
- Construction
- Manufacturing

Optimizing efficiency and productivity across asset-intensive industries.

Services

- Design & Facilities
- Healthcare & Life Sciences
- Public Sector
- Education
- Telecommunications
- Retail
- Banking & Financial

Enhancing operational excellence and customer satisfaction across diverse service sectors.

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Cohesive Clients

North America

Aecon	El Paso Electric	Ontario Power Generation
AltaGas Ltd.	Enbridge Gas	Ovintiv
American Type Culture Collection	ENMAX Corporation	Pacific Northern Gas
Apex Utilities	EPCOR	Pembina Pipeline Corporation
ATCO Ltd	EQT Corporation	PETRONAS Canada
Athabasca Oil Corporation	Equitrans Midstream	Seadrill
Aturapower	Evergy	Sentinel Peak Resources
BluEarth Renewables	Florida Municipal Power	Serafina Energy Ltd.
BP	Gibson Energy	So. California Gas Co
Bruce Power	Greenfire Resources Corporation	Spire Energy
BWX Technologies	Heritage Gas	Stanford Health
Calcasieu Refining	Jazz	Strathcona Resources Ltd.
Canlin Energy	KCBPU	Suncor Energy Inc.
Capital Power	Keyera	Syncrude
Cheniere Energy	LS Power	Tallgrass Energy
Coast Mountain Hydro	M Chem	TAQA
Cobb County Water	MDU Resources Group	Targa Resources
Colonial Pipeline	MEG Energy	Tarrant Regional Water
Colorado Springs Utilities	Monroe-Energy	Tennessee Valley Authority
Consolidated Edison	Mosaic	The Williams Companies
Cooperative Energy	n2grate	Thermo Fisher Scientific
DCP Midstream	NB Power	Tucson Electric Power
Diamond Offshore	Northwest Redwater Partnership	Twin Stars
Diversified Gas & Oil	Oakville Hydro	Upsher-Smith Labs
Dominion Energy	Obsidian Energy	VAALCO Energy, Inc.
East Kentucky Power Coop	ONEOK, Inc.	WBI Energy
El Paso Corp	Ontario Clean Water Agency	

Europe

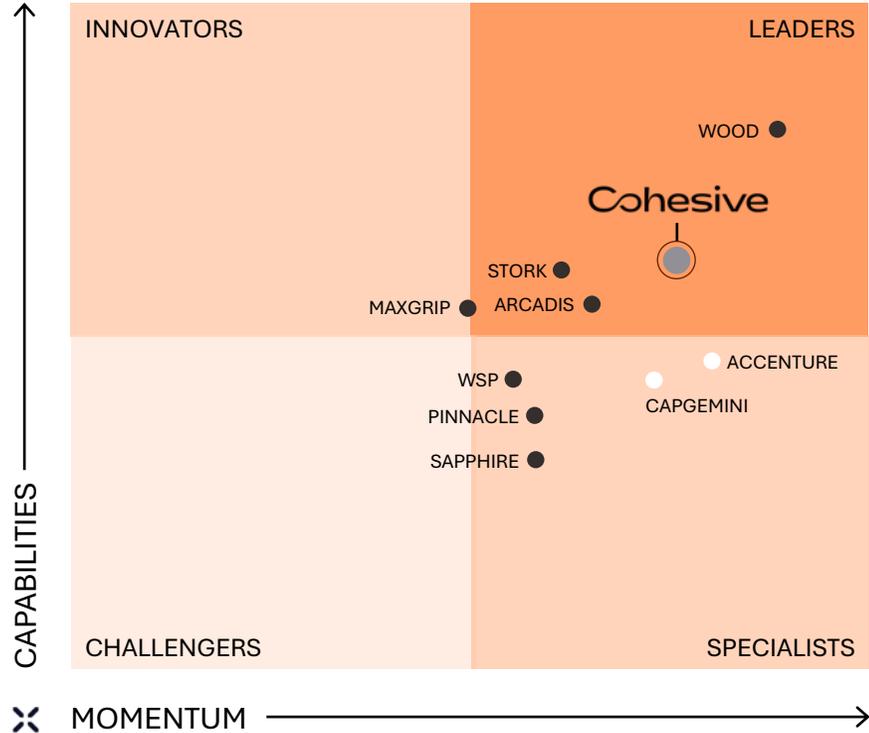|	
Affinity Water	Northumbrian Water Limited
AGC Chemicals Europe	PSW Integrity Limited
Bioenergy Infrastructure Group	px Group
Energia Group	Rolls-Royce
EnQuest	Stena-Drilling
Harbour Energy	United Utilities
Ipsum Utilities	Vital Energy
Kier	Well-Safe Solutions
Neptune Energy	Wessex Water
No. Ireland Electricity Networks	Westinghouse

Africa

Asia

Oceania

South America

Antarctica

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Recent Achievements

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INNOVATORS | LEADERS

WOOD ●

Cohesive

STORK ●

MAXGRIP ● ARCADIS ●

○ ACCENTURE

WSP ●

PINNACLE ● CAPGEMINI

SAPPHIRE ●

CHALLENGERS | SPECIALISTS

CAPABILITIES

MOMENTUM ⟶

Source: Green Quadrant: Industrial Asset Management Technology Implementation
Service 2024
Copyright © Verdantix Ltd 2007-2024

Sustainability

2024 IBM
Partner Plus™ Awards
Geography Winner

- The award was secured for Cohesive's successful work with Con Edison, which supplies electric, gas and steam services to 10 million people across New York City and Westchester County.

- Cohesive supported the energy giant's on the IBM Maximo Application Suite (MAS), providing expertise and input across integration/
configuration, automated testing, change management and training and project management.

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Cohesive Asset Management Advisory

We inspire organisations to optimise value from their physical assets

Tailor-made asset management solutions that deliver real benefits

- Whether you are pursuing a specific asset management benefit, looking to improve something large or small in your asset management programme, need short-term or continued consulting support; our experienced team of asset management practitioners are ready, able, and eager to help you.

- Organisations seek asset management improvements to realise multiple benefits. These will differ from your competitors and be based on your objectives, unique operating context, and particular challenges. Cohesive prides itself on delivering asset management solutions that are effective, fit for purpose, and will exceed your expectations.

Which asset management benefits can we help you achieve?

Orientate your asset management systems to unlock value

Improve your asset performance & health

Enhance your financial performance

Manage your asset risks & opportunities

Transform your asset data into effective decisions

Asset management competency skills development & training

Our Asset Management Delivery Model

- Cohesive's Asset Management Delivery Model© provides an easy-to-understand and visual framework that both our consultants and clients can use to execute asset management programmes.

- It is flexible and expandable to incorporate your organisation's asset management ambitions, unique operating context, and challenges. Moreover, it is fully aligned with ISO 55001, GFMAM's 39 subjects, and IAM's 6-box model and follows the Plan-Do-Check-Act (PDCA) improvement cycle.
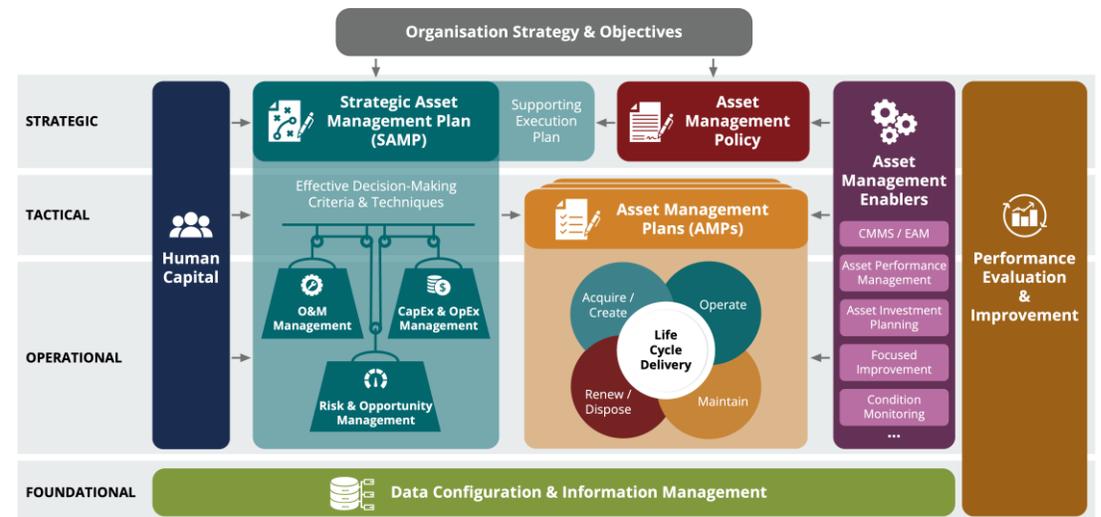
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Cohesive AM Model:

Cohesive AM Delivery Model mapped to:

- **ISO 55001** clauses (*see* highlighted)
- **GFMAM 39** subject (*numbered 1 to 39*)
- **IAM** Anatomy 6-box model (*see legend*)
- ISO 14224 Reliability Data Collection
- ISO 31000 Risk Management (Asset Focused)

Legend (*IAM 6-boxes*)

Enabling Excellence with Asset Performance Services

The Impact of Asset Management Practises on asset performance

2

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Asset Management: Using Analytics to Drive Predictive Maintenance

Aberdeen Group: March 2013

Extract from the **Analyst Insight** (March 2013), based on the responses of 140 executives, will uncover how leading companies use data and analytics to mange the reliability and maintenance of their asset base.

Aberdeen used four key performance criteria to distinguish Best-in-Class performance. These metrics measure the success of an organization's asset management not only in terms of how it improved plant efficiency, but also how successful these programs are achieving financial goals.

Respondents were divided into three categories based on their aggregate performance in these five metrics:
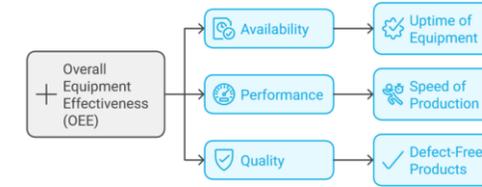- **the 20% of performers (Best-in-Class)**
- **the middle 50% (Industry Average)**
- **the bottom 30% of performers (Laggards)**

Definition for the Key Performance Indicators

√ **Overall Equipment Effectiveness (OEE):** Measured as a percentage by multiplying availability times performance times quality

√ **Unscheduled Asset Downtime:** Measured as the amount of unscheduled time the asset is offline against total asset availability

√ **Maintenance Cost:** Measured as year-over-year reduction in total maintenance costs

√ **Return on Asset (RoA):** Measured as the percentage of return on asset (new income / total asset) goal achieved versus corporate goal

Overall Equipment Effectiveness

https://www.6sigma.us

Definition of Maturity Class	Mean Class Performance
Best-in-Class: Top 20% of aggregate performance scorers	• 1.7% Unscheduled Asset Downtime • 91% Overall Equipment Effectiveness (OEE) • +20% Return on Assets vs. Corporate Plan • -31% Reduction in Maintenance Costs
Industry Average: Middle 50% of aggregate performance scorers	• 6.9% Unscheduled Asset Downtime • 83% Overall Equipment Effectiveness (OEE) • +7% Return on Assets vs. Corporate Plan • -11% Reduction in Maintenance Costs
Laggard: Bottom 30% of aggregate performance scorers	• 14.8% Unscheduled Asset Downtime • 73% Overall Equipment Effectiveness (OEE) • -11% Return on Assets vs. Corporate Plan • 0% Reduction in Maintenance Costs

Source: Aberdeen Group, November 2012

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Analyst Insight (Aberdeen Group, March 2013)

Figure 3: Business Capabilities

Source: Aberdeen Group, November 2012

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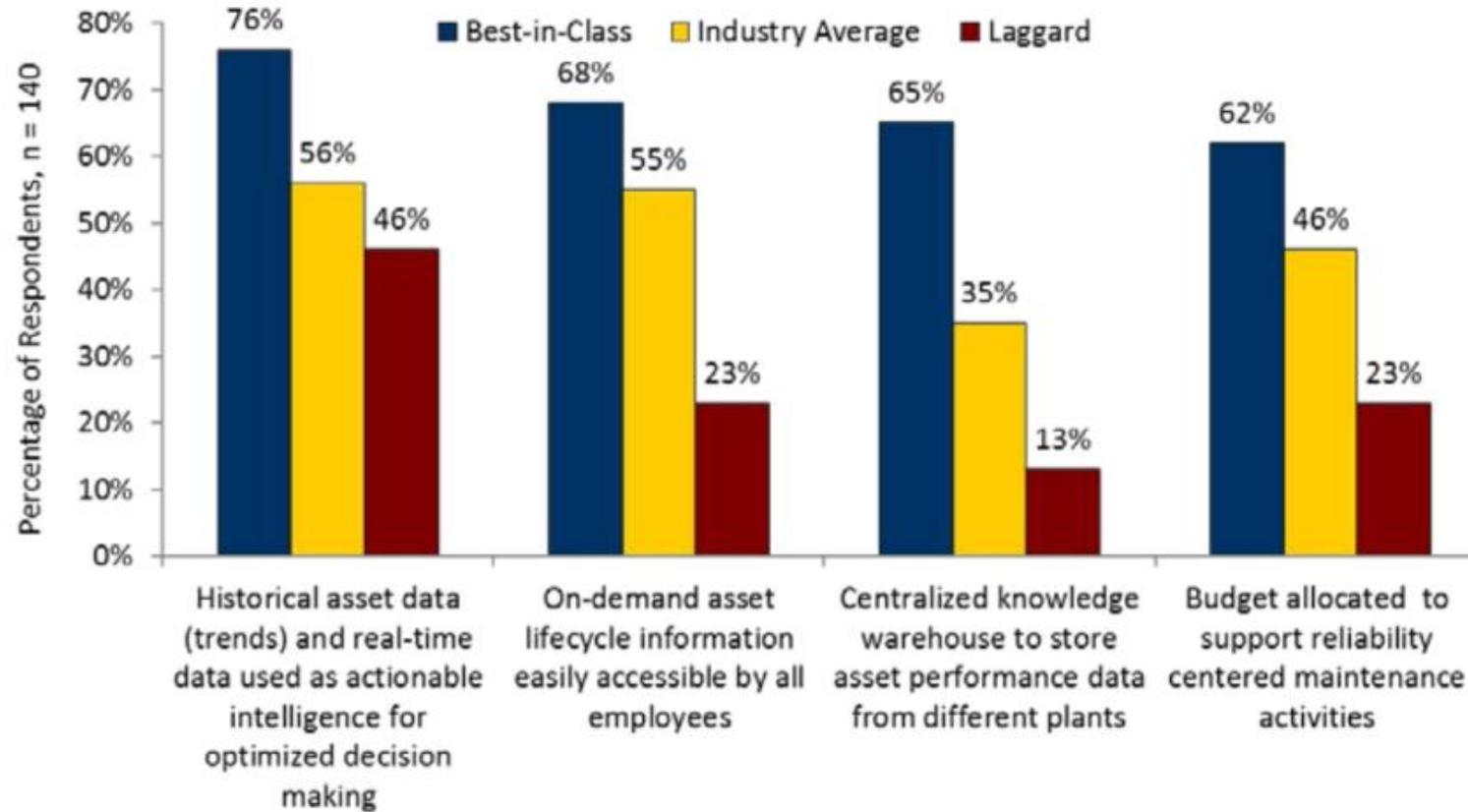
Analyst Insight (Aberdeen Group, March 2013)

Figure 4: Interoperability between Enterprise Systems

- EAM and ERP: Best-in-Class 53%, Industry Average 45%, Laggard 47%
- EAM and EHS: Best-in-Class 47%, Industry Average 28%, Laggard 11%
- EAM and MOC (Management of Change): Best-in-Class 42%, Industry Average 29%, Laggard 14%
- EAM and Mobility Systems: Best-in-Class 39%, Industry Average 25%, Laggard 11%
- EAM and Remote Monitoring: Best-in-Class 39%, Industry Average 25%, Laggard 11%
- EAM and Energy Management: Best-in-Class 26%, Industry Average 17%, Laggard 10%

Percentage of Respondents, n = 140

Source: Aberdeen Group, November 2012

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Analyst Insight (Aberdeen Group, March 2013)

Figure 4: Technology Enablers

Analytics
- Best-in-Class: 82%
- Industry Average: 38%
- Laggard: 36%

Master Data Management
- Best-in-Class: 67%
- Industry Average: 47%
- Laggard: 40%

Workflows
- Best-in-Class: 67%
- Industry Average: 38%
- Laggard: 36%

Dashboards
- Best-in-Class: 61%
- Industry Average: 36%
- Laggard: 35%

Risk Management
- Best-in-Class: 59%
- Industry Average: 33%
- Laggard: 33%

Audit Management
- Best-in-Class: 47%
- Industry Average: 26%
- Laggard: 16%

Change Management
- Best-in-Class: 41%
- Industry Average: 39%
- Laggard: 26%

■ Best-in-Class
□ Industry Average
■ Laggard

Percentage of Respondents, n=119

Source: Aberdeen Group, September 2012

To enable decision making plant-level employees need to have access to timely, relevant data. The BIC are differentiating from competitors through investments in technology, and more importantly investing in automation to enable data collection and aggregation of information.

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Introduction to ISO 55000 Series of Standards

3

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Unlocking Value with the Latest ISO 55000 Updates

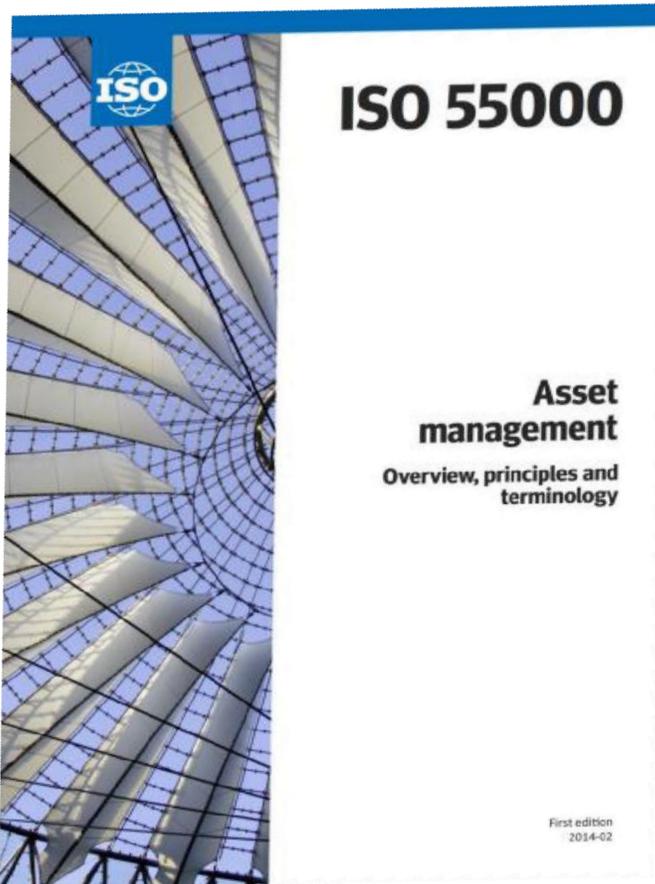*How the New Asset Management Standard can enhance Organisational Performance & Financial Resilience*

- **Ensures efficient use** and maintenance of assets.
- **Improves Decision-Making:** Provides a framework for smarter investments.
- **Enhances Risk Management:** Identifies and mitigates asset-related risks.
- **Increases Cost Efficiency:** Reduces repair costs and downtime.
- **Boosts Performance:** Enhances productivity and service delivery.
- **Ensures Regulatory Compliance:** Meets legal and regulatory requirements.
- **Builds Stakeholder Confidence:** Demonstrates commitment to high standards.
- **Promotes Long-Term Sustainability:** Extends asset lifespan and performance.
- **Strengthens Financial Resilience:** Improves financial stability and resilience.
- **Encourages Best Practices:** Provides a consistent framework for asset management

ISO 55000

Asset management

Overview, principles and terminology

First edition 2014-02

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ISO 5500x series of standards
The series up to June 2024
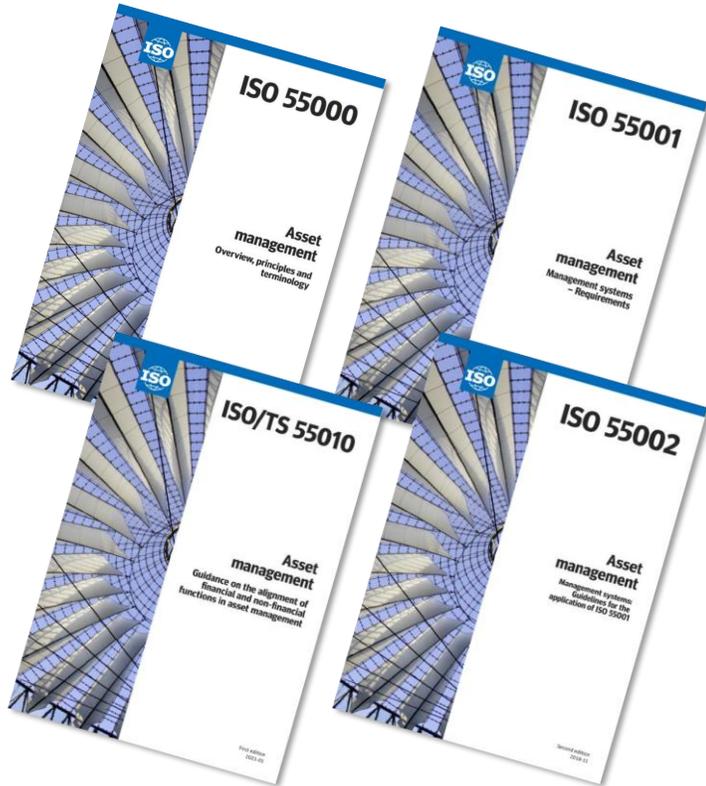
ISO 55000: 2014
Overview, principles and terminology

ISO 55001: 2014
Management systems – Requirements

ISO 55002: 2018
Management systems – Guidelines on the application of ISO 55001

ISO/TS 55010: 2019
Guidance on alignment of asset management, finance and accounting

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Latest Updates

	<2014	2018/19	2024	2026?
55000: Principles, Overview, Terminology	V1 →		V2	
55001: Requirements	V1 →		V2	
55002: Guidance	V1 →	V2 →		V3
55010: Financial and non-financial alignment		V1 →	V2	
55011: Public policy guidance			V1	
55012: People involvement and competence			V1	
55013: Data for asset management			V1	

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ISO 5500x series of standards

The image shows six fanned-out International Standard documents:
- **ISO 55000:2024** — International Standard, Edition 2, 2024-07, Asset management — Vocabulary, overview and principles
- **ISO 55001:2024** — International Standard, Edition 2, 2024-07
- **ISO/TS 55010:2024** — International Standard, Edition 2, 2024-07
- **ISO 55011:2024** — International Standard, Edition 1, 2024-08
- **ISO 55012:2024** — International Standard, Edition 1, 2024-07
- **ISO 55013:2024** — International Standard, Edition 1, 2024-07

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ISO5500x series of standards: Currently

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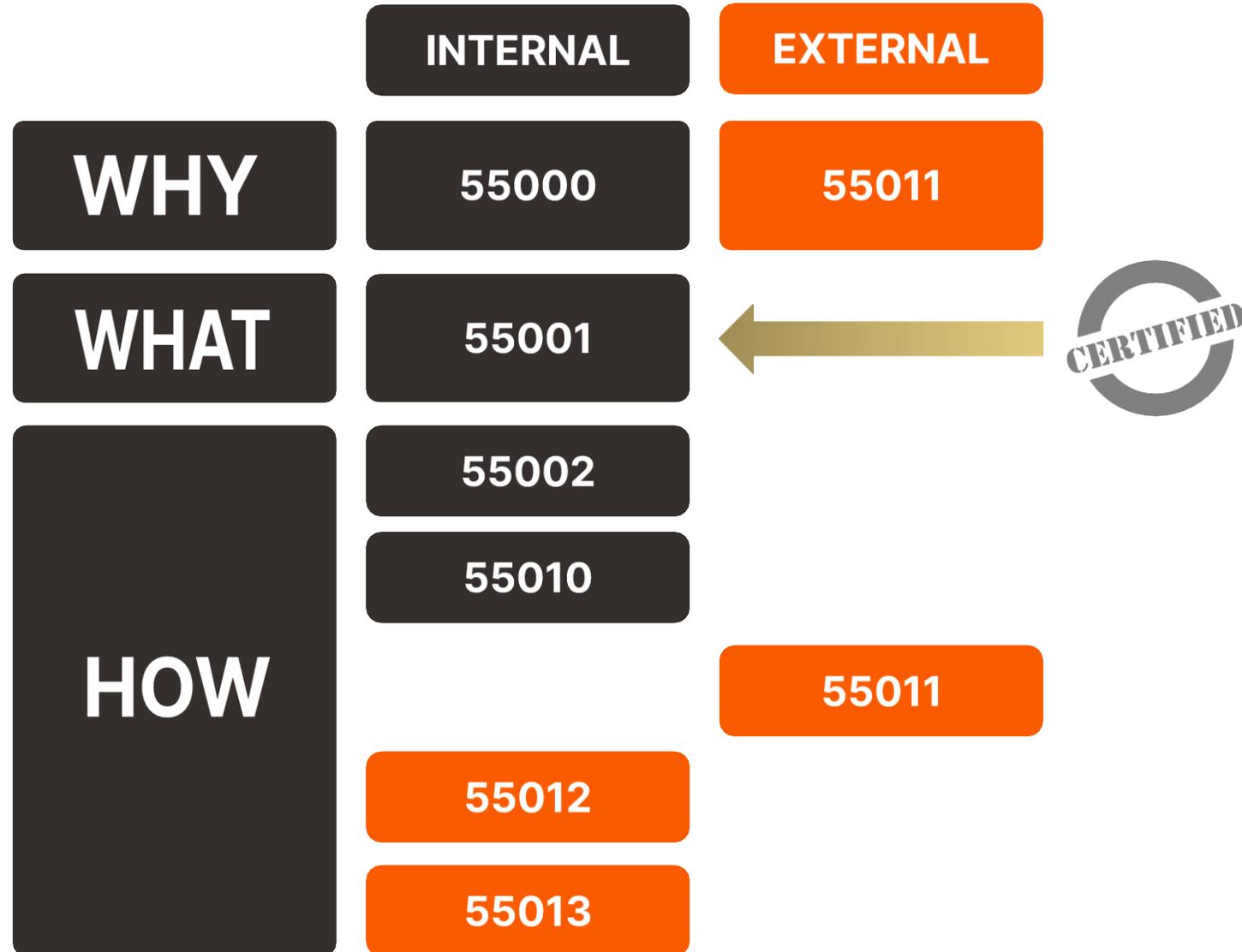
Conclusion

In summary, the latest ISO 55000 updates offer a robust framework for enhancing asset management, leading to improved performance, cost efficiency, and financial resilience. However, it's important to recognize that ISO 55000 is not a silver bullet.

Organizations must also invest in:

- **Training and Development**: Ensuring staff are well-equipped to implement and maintain the standards.

- **Continuous Improvement**: Regularly reviewing and updating practices to adapt to new challenges.

- **Holistic Approach**: Integrating ISO 55000 with other organizational strategies and goals.

By combining ISO 55000 with these investments, organizations can truly unlock its full potential and drive sustainable growth.

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