BIMCOMMUNITY AFRICA

Raising the BIM tide

Better Information Management

… and digital project delivery

Non-Profit Company

When the tide comes in…

… all the boats rise

BIM COMMUNITY AFRICA

- ✓ ***Non-profit***
- ✓ ***Neutral***
- ✓ ***Community Driven***
- ✓ ***Passionate about better delivery of projects and achievement of value to users through Better Information Management***

Raising the BIM tide

Today's Topic:

Digital tools, BIM, and AI are transforming architecture, engineering and construction—demanding standardised, structured data as deliverables from projects…

So HOW do we buy BIM in Africa??

Top 6 Challenges to BIM Adoption in RSA (per BIM commUNITY Africa)

Procurement Design & Unrealistic Tender Requirements

Misaligned or undeveloped BIM-tender routes, combined with inconsistent local standards, lead to contractual expectations that are impractical for many contractors to meet. Mandates often specify unrealistic BIM deliverables without adequate guidance or realism.

Inconsistent Standards & Lack of Harmonisation

Despite the adoption of ISO 19650 as a South African standard, procurement protocols and industry practices remain inconsistent. Lack of local standard usage, conflicting guidelines, and misaligned contract clauses undermine unified implementation.

Skills Shortages & Capacity Constraints

A widespread deficiency in BIM competency exists across clients, designers, and contractors. Training opportunities are limited, and professionals frequently lack familiarity with digital information deliverables and process requirements.

Resistance to Change & Cultural Inertia

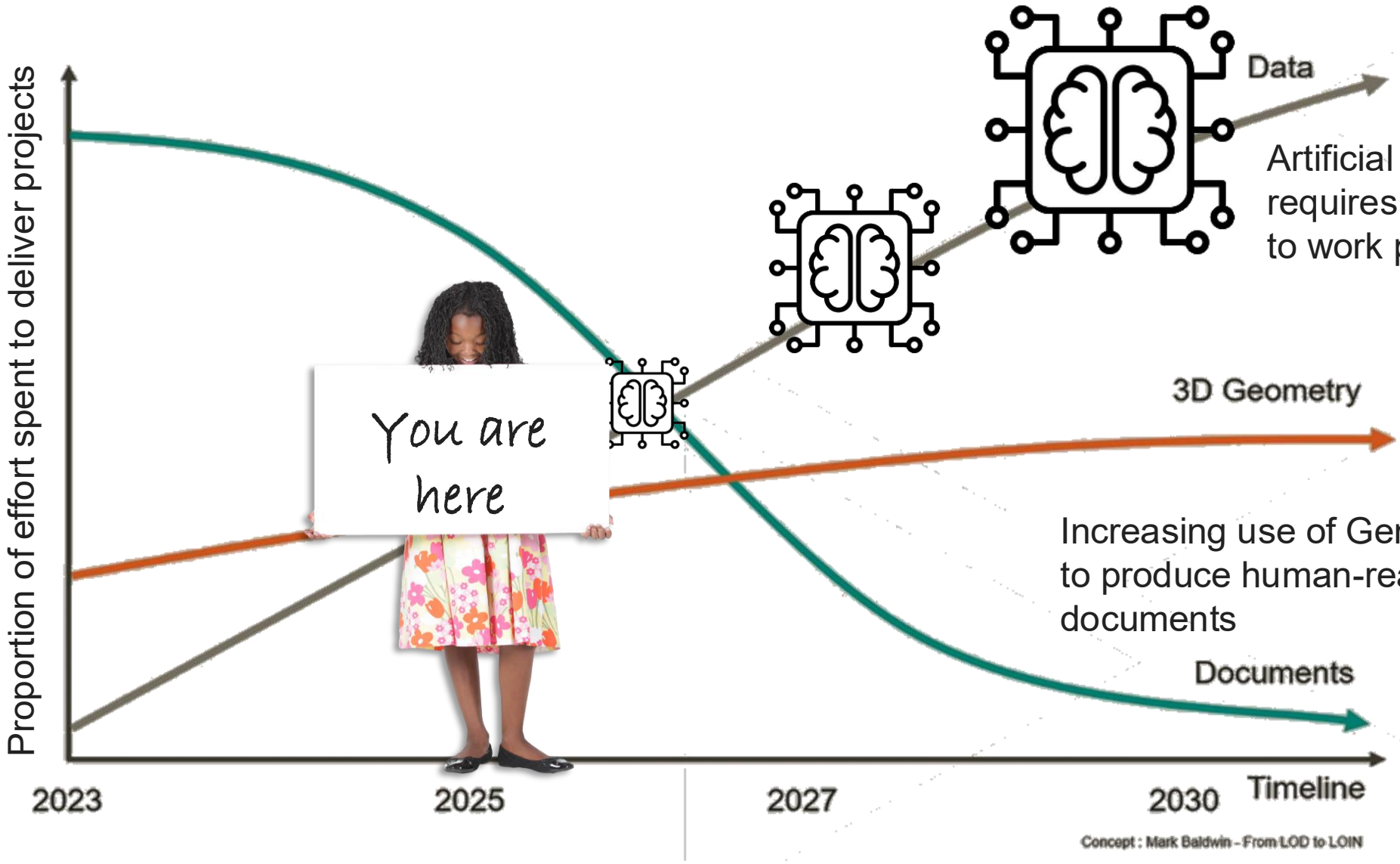
Generational resistance, entrenched traditional practices, and reluctance to alter established workflows impede BIM acceptance. Change management strategies (e.g. ADKAR) are still scarcely applied.

High Upfront Costs & Economic Constraints

Perceptions of BIM as expensive—due to software licensing, network infrastructure upgrades, training, and hardware—continue to deter uptake, especially among smaller firms and public-sector clients.

Unclear Value Proposition & Weak ROI Articulation

The long-term benefits of BIM (efficiency, cost savings, better operations) are poorly understood or quantified. Traditional cost-benefit frameworks struggle to capture BIM's intangible and strategic advantages.



Artificial Intelligence requires good information to work properly

So-called "BIM Models"

Increasing use of Generative Technology to produce human-readable information… documents

BIM is all about creating and integrating a combination of **data, documentation and geometry**…

Attribute	Description / Value Type
Asset Type	Bridge Balustrade
Asset Subtype	Safety Barrier / Pedestrian Railing / Vehicle Containment
Structure ID	Unique ID referencing parent bridge structure (e.g. BRG-000123)
Balustrade ID	Unique tag (e.g. BRG-BAL-001) following structured tag convention
Location	Start and end km on structure (e.g. 2.145–2.178 km)
Asset Classification Code	UniClass: PR-40-30-45-65 (example for balustrade)
Linked Documents	Design drawings, inspection photos, certificates (CDE reference path)
Ownership	SANRAL / Provincial Authority / Concessionaire

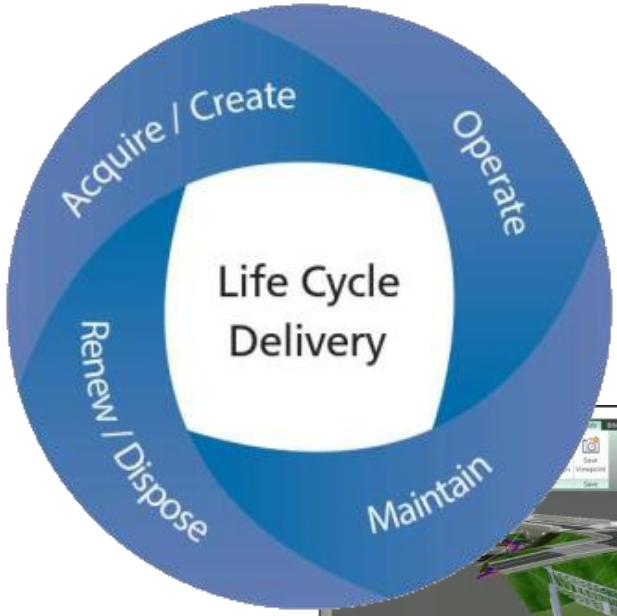
Classification and Identifier
Links to other data → →

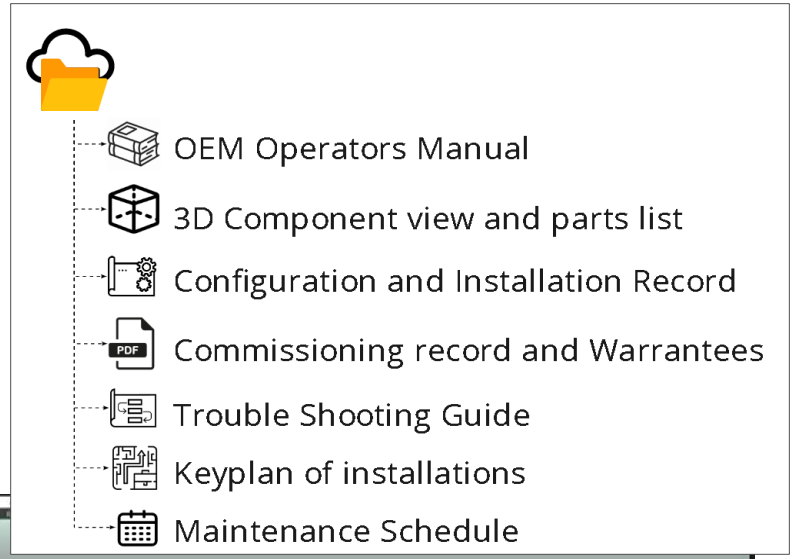
- OEM Operators Manual
- 3D Component view and parts list
- Configuration and Installation Record
- Commissioning record and Warrantees
- Trouble Shooting Guide
- Keyplan of installations
- Maintenance Schedule

BIM is all about creating and integrating a combination of data, documentation and geometry…

… throughout the **lifecycle** of a built asset.

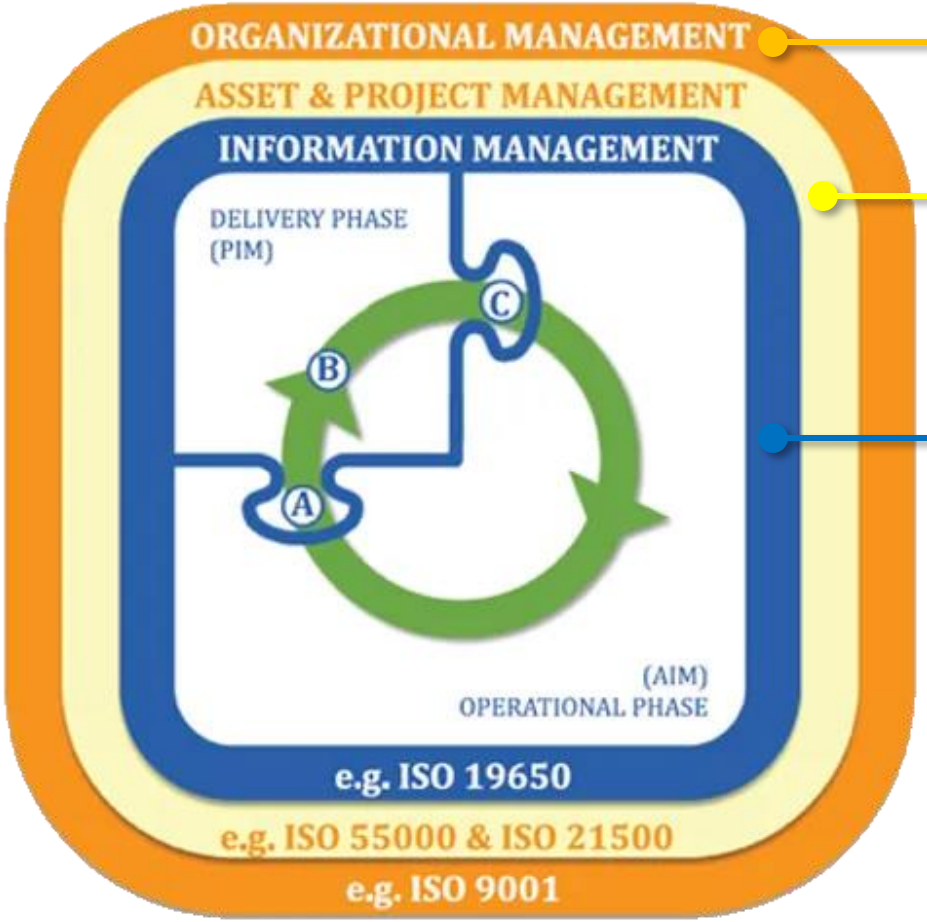
Figure 4: The IAM's 10-box Capabilities Model





ISO 55000 - Good Asset Management depends on good information

Relevant Standards for Digital Project Delivery



SANS 9001 ensures that project deliverables meet quality standards

SANS 55000 aids in managing equipment, facilities, and infrastructure assets efficiently.

SANS 21500 provides guidance on project management

SANS 19650 enhances collaboration among stakeholders through standardized processes.

Delivery

Follow **SANS 19650** to ensure delivery of

- ✓ the right information
- ✓ to the right party
- ✓ at the right time.

By integrating these standards, organizations can achieve better alignment of their processes, improve project execution and stakeholder satisfaction, and enhance overall operational excellence.

The Information Cycle

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Repeat…

Intensive use of AIM during operations

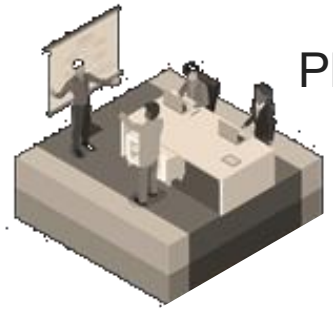
Lifecycle Optimisation

Assessment and Need
OIR → AIR → AIM

Commencement of Operations

Project Initiation
PIR + PIM Spec

Integrate PIM into AIM



Planning

Contractual Req'ments
PIR → EIR

Handover

Tender, Respond, Appoint

Review and approve the PIM against the PIR

Commissioning

Conceptual Design

Develop & agree BEP

Construction

Design and Engineering

Updated information created and collected during construction

Execute Design, produce information

Procurement

Image adapted from www.tekla.com

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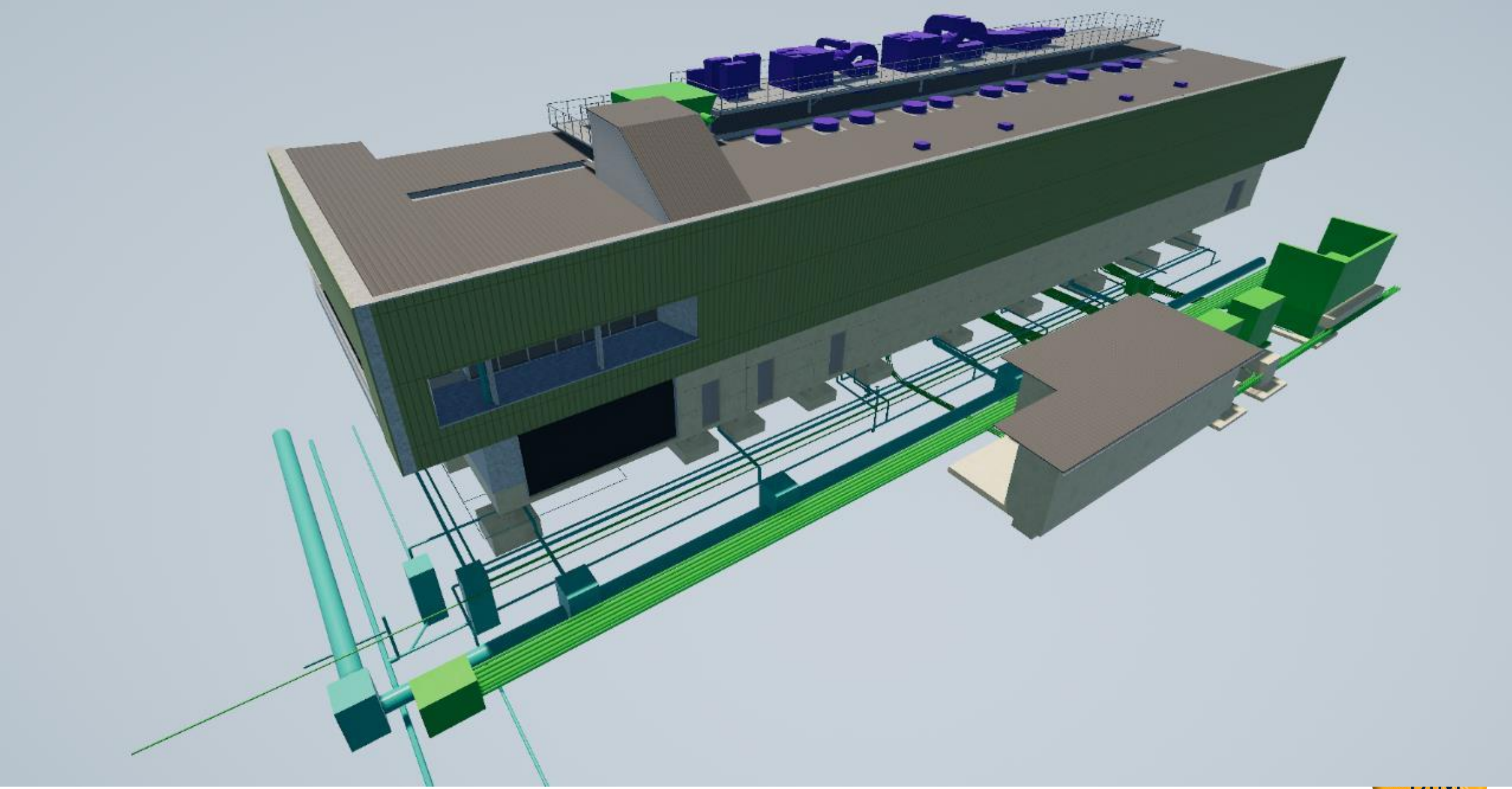
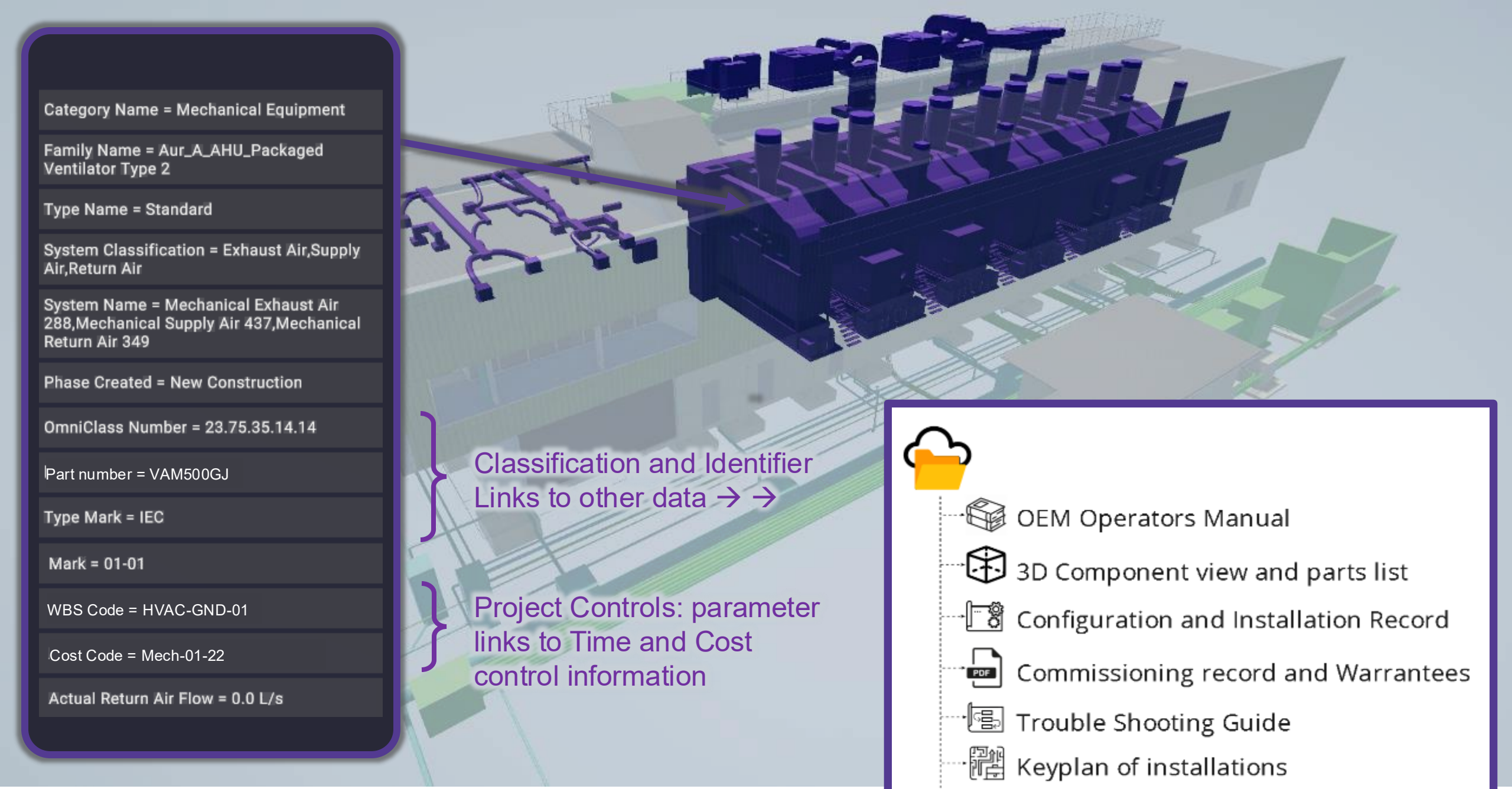
B I M

Better Information Management

Raising the BIM tide




Category Name = Mechanical Equipment
Family Name = Aur_A_AHU_Packaged Ventilator Type 2
Type Name = Standard
System Classification = Exhaust Air,Supply Air,Return Air
System Name = Mechanical Exhaust Air 288,Mechanical Supply Air 437,Mechanical Return Air 349
Phase Created = New Construction
OmniClass Number = 23.75.35.14.14
Part number = VAM500GJ
Type Mark = IEC
Mark = 01-01
WBS Code = HVAC-GND-01
Cost Code = Mech-01-22
Actual Return Air Flow = 0.0 L/s
Classification and Identifier Links to other data → →
Project Controls: parameter links to Time and Cost control information
OEM Operators Manual
3D Component view and parts list
Configuration and Installation Record
Commissioning record and Warrantees
Trouble Shooting Guide
Keyplan of installations
Maintenance Schedule

3D Modeling vs Information Modelling

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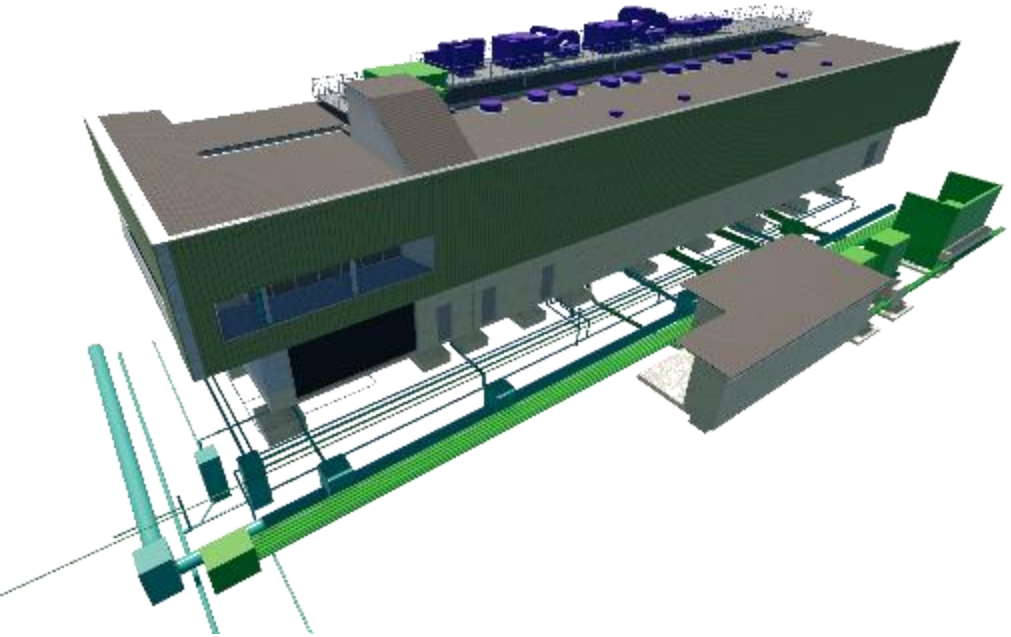
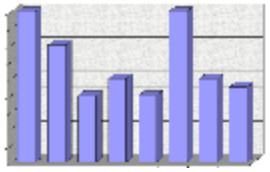


Link Static Documentation and Metadata to Model — 3D BIM

Link the project schedule — 4D BIM

Link the cost estimate and cashflow — 5D BIM

Link sustainability data and ratings — 6D BIM



Link performance data — 7D BIM

3D Modeling vs Information Modelling

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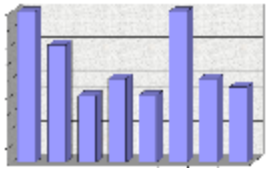
3D [illegible]boration
Cl[illegible]anagement
Interdisciplinary coordination

Data enriched model[illegible] BIM
handover docs

T[illegible]ions of 4D BIM
[illegible]uction, coordination

Cashflow visualisation, 5D BIM
earned value demonstration

Calculation of Green Star 6D BIM
Ratings



Asset performance mgmt 7D BIM
→ Digital Twins

COMING SOON IN A TENDER NEAR YOU…

How digital project delivery happens (or should happen) in practice
… according to SANS 19650

Key Stakeholders	Corporate Management	Asset Managers	Asset Operations	Project Managers	Professional Team	Contractor
						

Key Stakeholders | Corporate Management | Asset Managers | Asset Operations | Project Managers | Professional Team | Contractor

CAPEX – get it built!

Operations – ensure the ***full potential value is realised***

Design | Build | Operate and Maintain, Upgrade, Expand, Retire

3D design, improved efficiencies and collaboration during CAPEX phase

Handover

Better information during OPEX phase = more effective operation and higher value to the Asset Owner and Asset Benefactors

Construction is about enabling value in the long term

Key Stakeholders | Corporate Management | Asset Managers | Asset Operations | Project Managers | Professional Team | Contractor

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Better information during OPEX phase = more effective operation and higher value to the Asset Owner and Asset Benefactors…

Really?

Asset Managers

Asset Operations


Key Stakeholders
Corporate Management
Project Managers
Professional Team
Contractor
And ours too!
CAPEX – get it built!
Operations – ensure the full potential value is realised
Design
Build
Operate and Maintain, Upgrade, Expand, Retire
Handover
You need to cater for our information needs from the start!
Asset managers
Asset Operations
Feed-back the lessons learned and knowledge gained from operations

Key Stakeholders

Corporate Management

Project Managers

Professional Team

Contractor

Define the Organisational Information Requirements

Project Information Requirements

CAPEX – get it built!

Operations – ensure the ***full potential value is realised***

Design

Build

Operate and Maintain, Upgrade, Expand, Retire

Handover

Define Asset Information Requirements

Asset Managers

Asset Operations

Incorporate lessons learned and knowledge gained from operations

AIM

Key Stakeholders

Corporate Management

Project Information Requirements

CDE

Project Managers

Professional Team

Contractor

CAPEX – get it built!

Operations – ensure the ***full potential value is realised***

Design

Build

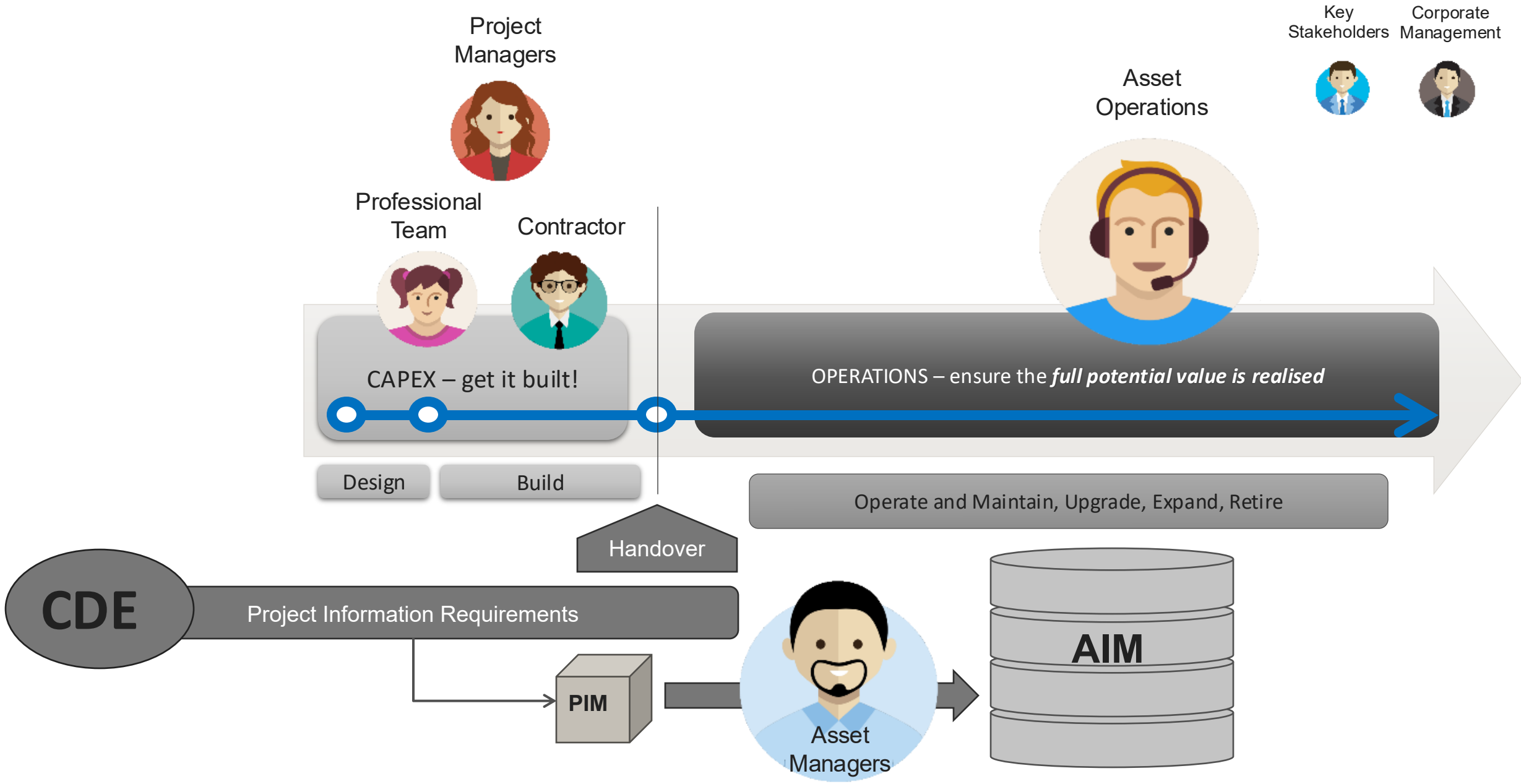
Handover

Operate and Maintain, Upgrade, Expand, Retire

Asset Managers

AIM

Asset Operations


Project Managers
Key Stakeholders
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CAPEX – get it built!
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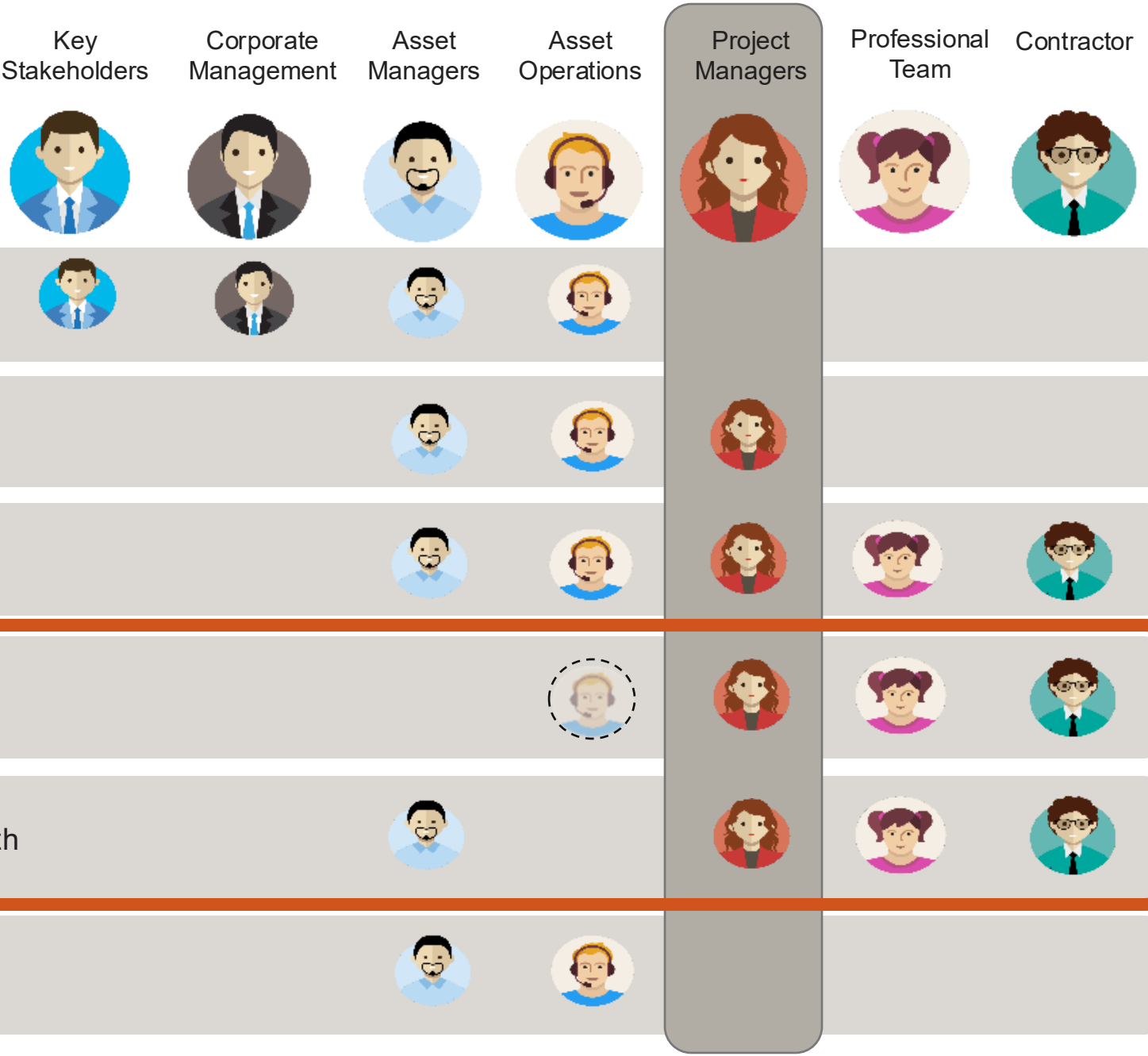
Handover
CDE
Project Information Requirements
PIM
Asset Managers
AIM

You need collaborative teams, following collaborative processes



Assessment and Need → OIR, AIR, AIM definition
This is where you must define your information requirements, BEFORE the project is procured

Project Initiation → PIR definition → PIM Spec
Establish a common understanding of what, why, how, when and who will create information during the project

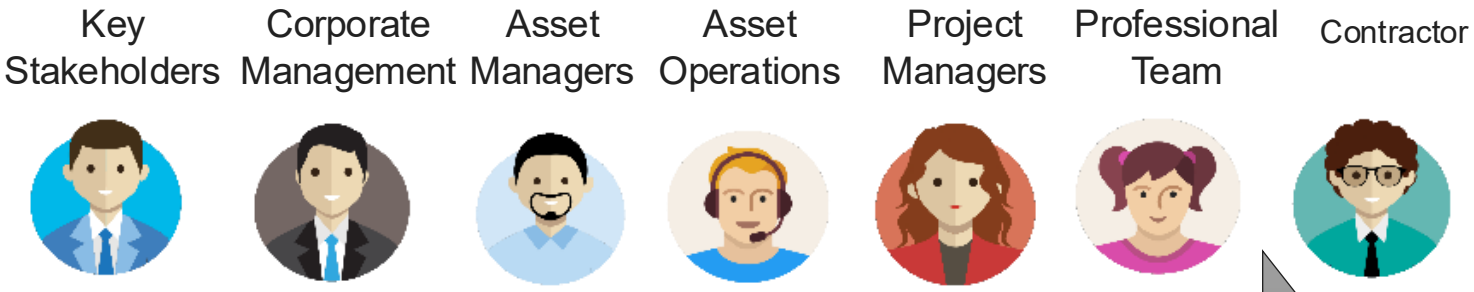
Procurement
Employer requirements (PIR and EIR) → Issue Tender.
Parties respond, Client evaluates and appoints.

Project Execution
Design, construct and install the required assets,
while producing the Project Information Model (PIM)

Handover and Acceptance of the PIM
Review and approve, (or reject and return) the PIM in line with the PIM Spec, in parallel with the physical commissioning

Integrate PIM into the AIM
The PIM is incorporated into the AIM, updating / replacing / supplementing the data, enabling improved operations

That's how BIM delivers better value



CAPEX – get it built!

Operations – ensure the ***full potential value is realised***

Design | Build | Operate and Maintain, Upgrade, Expand, Retire

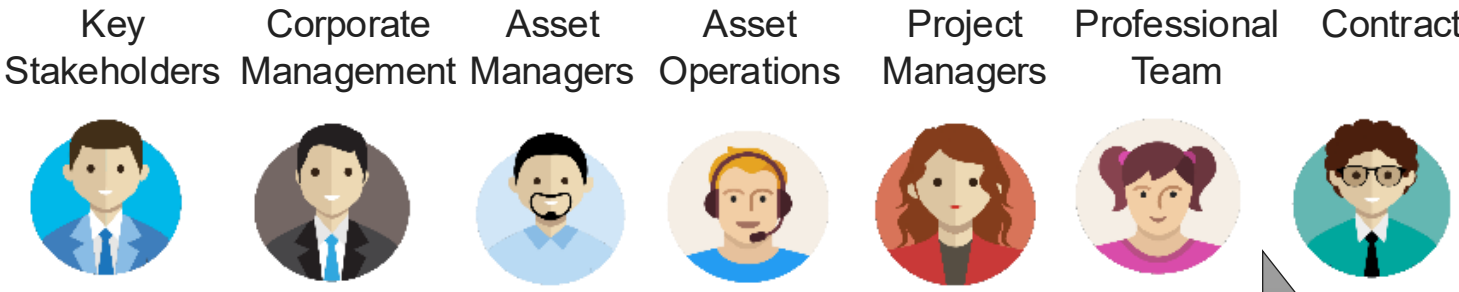
Handover

3D design, improved efficiencies and collaboration during CAPEX phase

Better information during OPEX phase = more effective operation and higher value to the Asset Owner and Asset Benefactors

Construction is about enabling value in the long term

That's how BIM delivers better value



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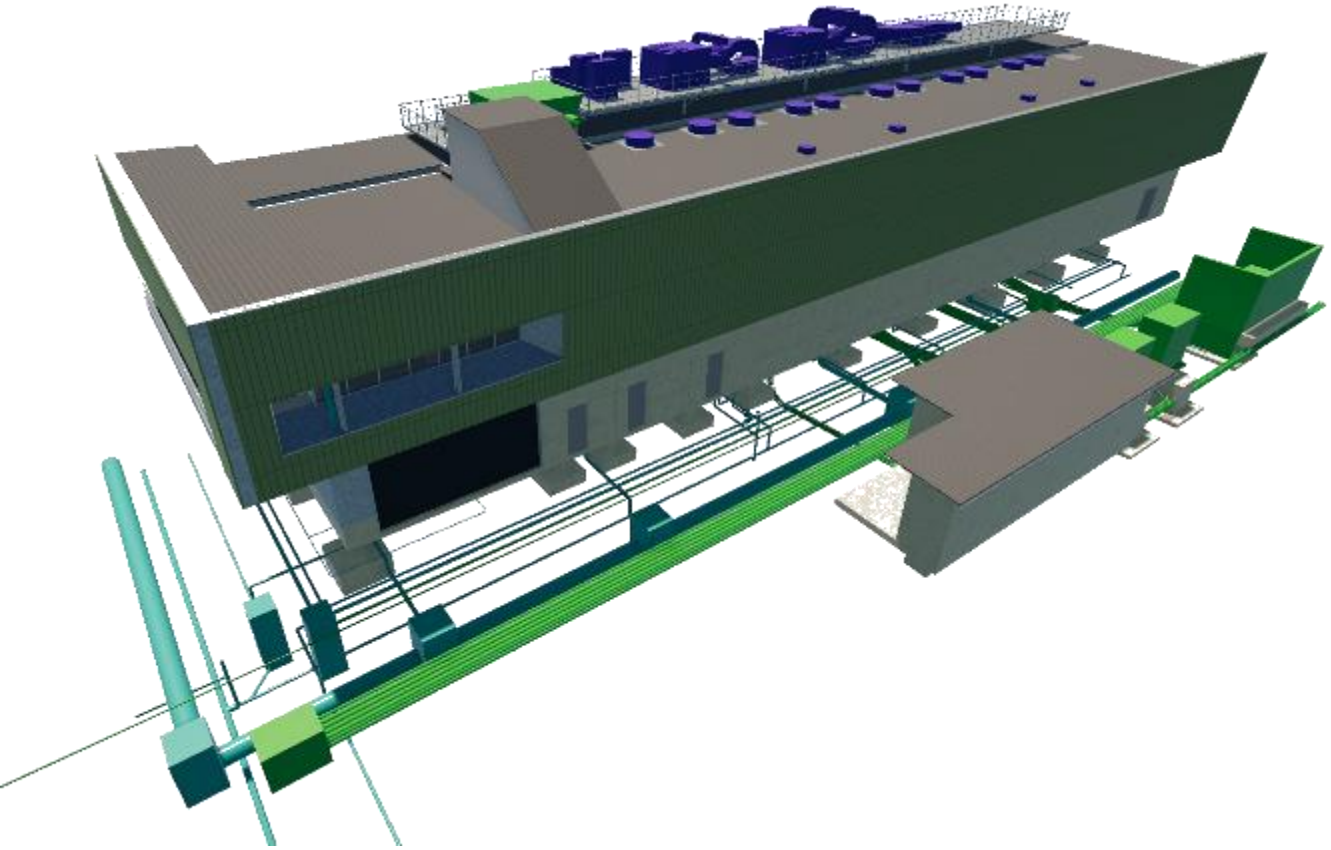
Construction is about enabling value in the long term

Key Takeaways – Information Requirements

- Information requirements according to SANS19650 are outcome driven and Client Led
- Information is a key output of projects in the modern era
- The PM plays a key role in ensuring the delivery of information



It all starts at the beginning,
so begin with the end in mind.

No matter where you are along the journey, the path feels steep!

The Reality….

Image Generated by OpenAI

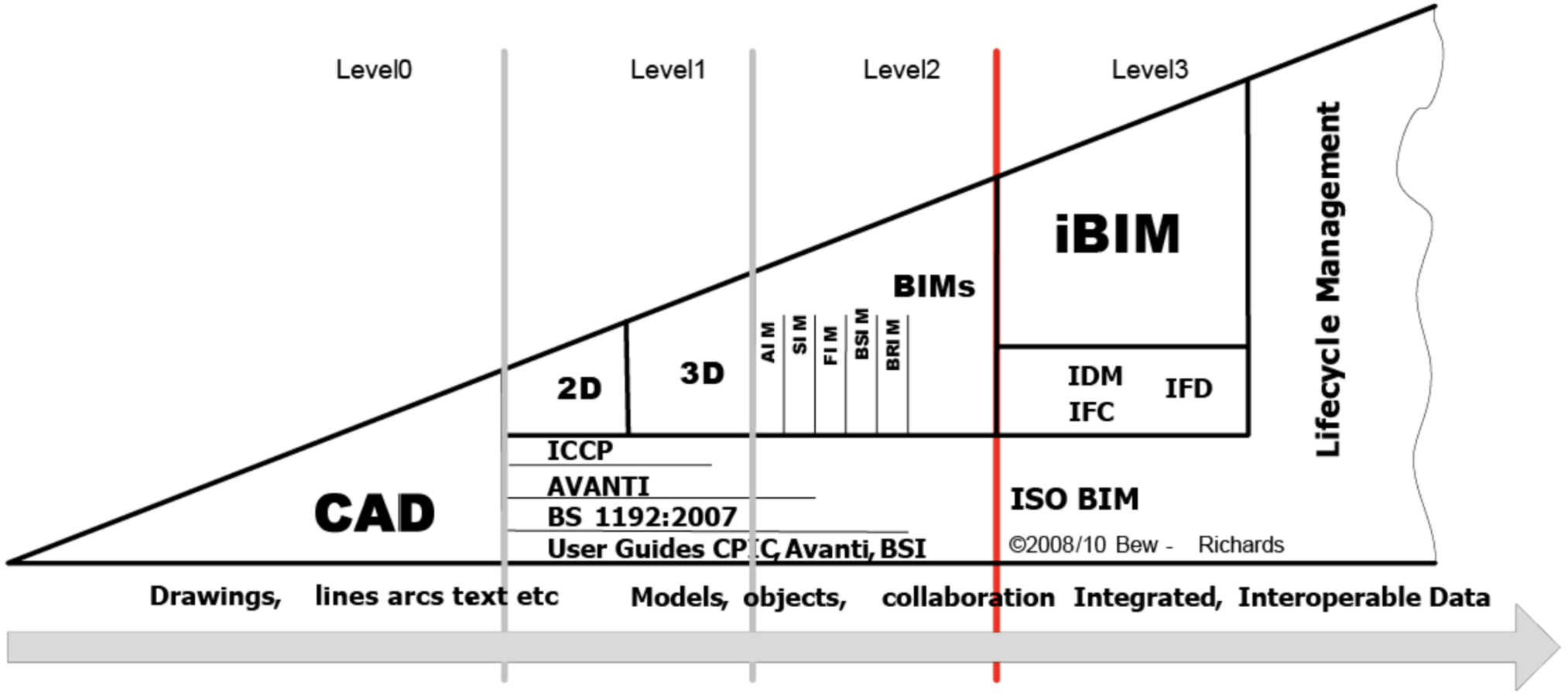
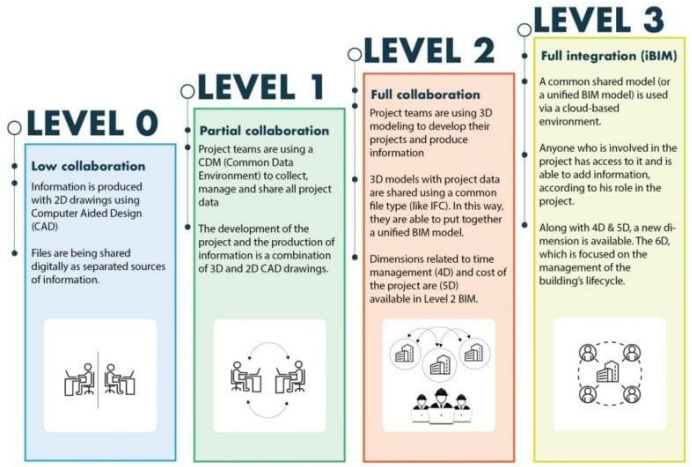
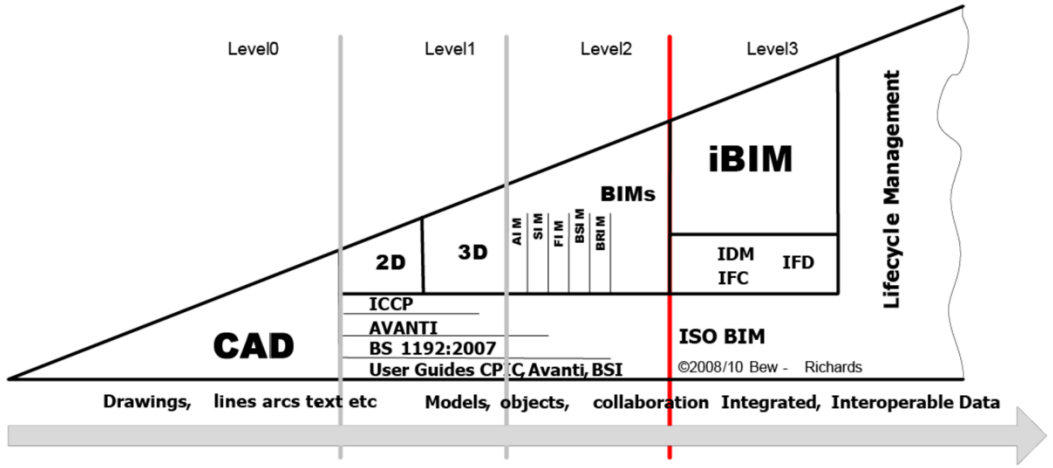
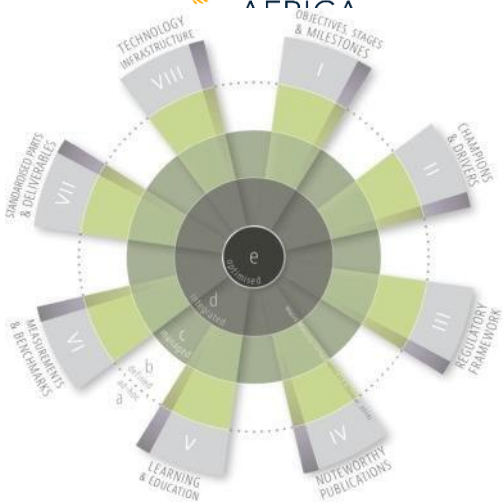


Fig. 1. The UK BIM Maturity Model (GCCG, 2011)







- ✓ Bew–Richards BIM Maturity Levels (UK BIM Framework)
- ✓ ISO 19650-1 Information Management Maturity
- ✓ UK BIM Framework Capability Stages
- ✓ EU BIM Task Group – Public Sector BIM Maturity Levels
- ✓ Kassem & Succar BIM Maturity Matrix (BIMMM)

Maturity Framework	Pre-BIM	Baby Bear	Mama Bear	Papa Bear
Bew–Richards BIM Maturity Levels (UK BIM Framework)	Level 0: Unmanaged CAD, 2D drafting, unstructured delivery	Level 1: Managed CAD, standardized processes	Level 2: Collaborative BIM, federated models, CDE	Level 3: Fully integrated BIM (iBIM), shared models, lifecycle integration
ISO 19650-1 Information Management Maturity	No structured information management; email-based exchanges	Basic: Ad hoc project info, simple CDE usage	Intermediate: Defined EIRs, shared CDE, some AIR/PIR alignment	Advanced: Unified information strategy, governed data across CAPEX/OPEX
UK BIM Framework Capability Stages	Pre-BIM: No CDE, disconnected data, 2D drawings dominate	Stage 1: Project-level BIM adoption	Stage 2: Organization-wide BIM standards and CDE implementation	Stage 3+: Portfolio-level integration and lifecycle information management
EU BIM Task Group – Public Sector BIM Maturity Levels	Initial: No BIM, unmanaged delivery, 2D CAD or PDF-based handover	Managed: BIM at project level, partial CDE	Defined: Organizational BIM strategy, standardized delivery	Integrated: BIM embedded in asset lifecycle, enterprise-level collaboration
Kassem & Succar BIM Maturity Matrix (BIMMM)	Pre-CS: No modelling, disconnected documentation, CAD workflows	CS1 / ML1–2: Object-based modelling, discipline-specific BIM	CS2 / ML3–4: Collaborative modelling, defined BEPs	CS3 / ML5: Integrated BIM, lifecycle-wide, organization and supply-chain ready

Bear Level	Pre-BIM	Baby Bear	Mama Bear	Papa Bear
Name	**Unstructured / Document-led**	**Project-led BIM Adoption**	**Organisational BIM Maturity**	**Enterprise-level Integrated BIM**
Definition	BIM is not implemented. Project information is unstructured, CAD-based, and managed via disconnected documents.	BIM is used on isolated projects. Delivery teams initiate modelling, coordination, and use of a CDE—even without client mandates.	BIM is embedded across the organisation. Standards, roles, and workflows are consistent and aligned with ISO 19650. Clients begin specifying information requirements.	BIM is fully integrated into business and asset management systems. Lifecycle information is planned, structured, delivered, and reused.
Key Characteristics	• 2D CAD drawings dominate • Information shared via email or USB • No modelling requirements • No naming standards or information structure	• LOD 200–300 models used • Project-specific BEP developed • Simple CDE used (WIP/Shared/Published) • File naming follows conventions • Minimal client-side reuse	• AIR and EIR defined • BEPs based on templates • CDE used consistently • BIM roles assigned and trained • Asset data and classifications embedded	• Information governed across CAPEX & OPEX • Models linked to asset registers, ERP, FM systems • Portfolio-level digital delivery strategy • Automated QA/QC • Open standards (IFC, COBie)
Typical Indicators	• Level 0 (Bew–Richards) • Pre-CS (Kassem & Succar) • “Initial” (EU BIM Task Group)	• Level 1 (Bew–Richards) • ISO 19650 Basic maturity • Stage 1 (UK BIM Framework) • “Managed” (EU BIM Task Group) • CS1 / ML1–2 (Kassem & Succar)	• Level 2 (Bew–Richards) • ISO 19650 Intermediate • Stage 2 (UK BIM Framework) • “Defined” (EU BIM Task Group) • CS2 / ML3–4 (Kassem & Succar)	• Level 3 (Bew–Richards) • ISO 19650 Advanced • Stage 3+ (UK BIM Framework) • “Integrated” (EU BIM Task Group) • CS3 / ML5 (Kassem & Succar)

Pre-BIM: The unstructured stage. Characterised by **disconnected** documents, unmanaged 2D CAD, and minimal digital coordination. Project information is **fragmented**, often exchanged via email or USB, with no naming standards, common data environment, or structured modelling. Information is **difficult to trace**, verify, or reuse. **Coordination errors**, **duplicated effort, and inconsistent handovers are common**.

Baby Bear: The foundational stage. Focuses on **initiating BIM practices** by ***producing or collecting structured, verified, traceable, and searchable information.*** Emphasis is placed on **basic CDE use, simple model outputs, and disciplined document management.**

Mama Bear: The intermediate maturity level. Reflects a growing organizational capacity to **implement BIM consistently across projects**. A *common data environment*, organizational-level *information requirements*, and ***integration with asset management processes*** are expected.

Papa Bear: The advanced stage. Represents a fully integrated, portfolio-level BIM strategy with standardized delivery methodologies, governed processes, high-quality structured data, and seamless integration of capital and operational information.

What would it look like if South Africa was all at this stage at a minimum?

Questions?

Comments?

Perspectives?

Lunch?

Workshop Focus and Talking Points

Core Messages

- **Information must be treated as a long-term asset**, not just project documentation.
- **Procurement processes must evolve** to specify, value, and audit information deliverables.
- **Data interconnectedness creates value**—without it, you lose context and opportunities.
- **Specialist roles are essential**—geospatial experts, information managers, and digital asset custodians.

Common Misconceptions to Address

- “BIM is just 3D modelling.”
- “Information management is an IT issue.”
- “Procurement of data is just about file delivery.”
- “It’s too expensive or complex to do properly.”

The municipality of “Nowhereyouknow” commissions a new water tower to improve pressure for an expanding township. The consulting engineer delivers PDF drawings via email. The architect submits renders, and the contractor receives a printed copy of the tender drawings during the site handover.

Six months into construction, the contractor discovers that the reinforcement details for the tower shaft conflict with the embedded starter bars shown on an outdated foundation drawing. The structural engineer is on leave, the updated drawings are buried in an email thread, and the clerk of works is left guessing which version to follow. No one has a consolidated model, and information lives in different silos—emails, desktops, Dropbox folders. Site instructions are handwritten.

When the project is finally handed over, the municipality receives a stack of documents: as-builts in PDF, warranties in hard copy, and no asset register. Six months later, when the telemetry pump fails, the maintenance team cannot identify the part number without physically climbing the tower.

The same municipality undertakes another water tower, this time guided by a newly adopted digital delivery strategy. They've developed a standardised Employer's Information Requirements (EIR) template with support from a digital advisor, and appoint a BIM coordinator within the consulting team. During design, the consultant team works in a shared Common Data Environment (CDE).

The 3D model of the tower includes LOD 300 geometry with embedded asset tags for pumps, ladders, access hatches, and valves. The project manager, quantity surveyor, and contractor all access a coordinated model using Navisworks and BIM 360. Clash detection is run before going to site. Drawings are extracted directly from the federated model. During construction, the resident engineer uses a tablet to view the latest model, and all RFIs and technical queries are logged and tracked in the CDE.

At handover, the client receives a structured set of documentation, and a tagged, verified as-built Revit model. The asset manager imports the model into their maintenance planning system. When the telemetry system needs replacement two years later, the maintenance team retrieves the asset code, datasheet, and supplier info in minutes.

Problem Statement

- South Africa's infrastructure (AECO) sector is trapped in a **zero-based project culture**, where information is generated in silos, delivered in unusable formats, and lost after handover. Without clear data policies, enforced standards, or skilled custodians, **valuable datasets are fragmented, disconnected, and rarely reused**.
- **Procurement remains focused on short-term outputs**, with no provision for structured, validated, or interoperable information.
- This **failure to treat data as a strategic asset** undermines decision-making, drives up costs, and erodes long-term value.
- The challenge is not just technical—**it is institutional and cultural**. Until information management is embedded in policy, roles, and oversight, the sector will remain locked in inefficiency and unable to realise the full value of its digital potential.

Possible future state

- Progressive public infrastructure agencies in South Africa now **treat information as a strategic asset**.
- Data governance policies define clear roles for **stewardship, supported by skilled appointments** and shared systems.
- Projects **deliver structured, georeferenced, metadata-rich information**, aligned with ISO 19650, and organisational asset hierarchies.
- A common data environment ensures consistency, **while integrated registers link GIS, ERP, and maintenance systems**—enabling cross-functional insights and smarter lifecycle decisions.
- Procurement **mandates information deliverables**, and audit trails support accountability.
- Though legacy integration and full automation remain challenges, **information management is no longer ad-hoc** … it is policy-backed, resourced, and embedded.
- This shift sets the foundation for **improved asset management, predictive analytics, and long-term infrastructure resilience.**

Organisational Information Requirements (OIR)

OIR Purpose	Definition Required to Enable the Shift
1. Enable strategic reuse of data	The organisation requires information to be structured, validated, and integrated into central registers to support lifecycle decision-making (e.g., network expansion, prioritised maintenance, budgeting).
2. Establish information as an asset	The organisation will treat all project and operational data as reusable corporate assets. Information stewardship and data governance must be embedded in policy and job roles.
3. Support performance monitoring and oversight	Project data must be auditable, metadata-rich, and available to internal and external oversight bodies (e.g., AGSA), supporting transparency, reporting, and accountability.
4. Standardise terminology and practices	All departments will use standard definitions (e.g., data vs information, BIM vs GIS), aligned with ISO 19650 and TMH18, to enable consistency and reduce confusion.
5. Facilitate digital integration	Information deliverables must be compatible with GIS, ERP, asset management, and planning systems to enable enterprise integration.

Asset Information Requirements (AIR)

AIR Purpose	Definition Required to Enable the Shift
1. Capture structured asset data at handover	Models, drawings, schedules, and documents must be delivered in standardised, georeferenced formats (e.g., IFC, COBie, shapefiles) with metadata aligned to the asset hierarchy.
2. Support asset lifecycle planning and costing	Each asset must be tagged and classified using TMH18 or UniClass; condition, location, cost centre, and intervention history must be recorded to support future decisions.
3. Enable cross-functional data queries	Asset data must include linkages between spatial (GIS), financial (ERP), and maintenance (AM) systems to support integrated decision-making and reporting.
4. Define model uses and validation rules	For every project, model purposes (e.g., clash detection, quantity take-off, handover) and required Level of Information Need must be defined and validated at key gateways.
5. Ensure information continuity across phases	Project information must remain traceable from planning through design, construction, and operations, with version control and change history maintained in a Common Data Environment (CDE).

Reframing the Issue: How to Buy BIM as a Value Service

Traditional Approach	Value-Driven Approach
BIM = model file	BIM = structured data that improves decision-making
No link to project KPIs	BIM use cases tied to measurable project or asset outcomes (e.g., fewer clashes, faster approvals, better O&M handover)
Lumped into fees	BIM explicitly scoped, priced, and tied to delivery milestones
Treated as a tech add-on	Framed as an enabler of **cost, schedule, risk, and quality performance**
Focused on CAPEX	Extends to OPEX – asset data, lifecycle tracking, and digital handover

Procurement Recommendations to Unlock Value

1. **Define Use Cases First** - What decision, process, or risk will BIM help with? (e.g., clash detection, handover, progress reporting)
2. **Include BIM in Tender Evaluation** - Score digital capability, past experience, and proposed BIM deliverables.
3. **Tie BIM to Payment Milestones** - Make model validation and data handover part of staged deliverables with quality checks.
4. **Use Outcome-Based Scopes** - Rather than “deliver a model,” require information that enables specific operational functions (e.g., update GIS, feed asset register, inform maintenance planning).
5. **Develop Cost/Benefit Cases** - Include a section in RFPs asking bidders to show how their BIM approach will reduce risk, shorten programme, or improve long-term value.

Growth in Capability to Specify and Approve BIM Deliverables

Maturity Level	Specification Capability	Approval Capability
Pre-BIM *Unaware / fragmented*	No information requirements (EIRs); BIM not mentioned in contracts. Focus is on drawings, not data.	No validation of models or data. Handovers are PDF or paper. Quality control focuses on physical works only.
Baby Bear *Emerging awareness*	BIM is requested but poorly defined (e.g., "we want a model"). No clear purpose, format, or classification is stated. EIRs may be adapted from templates with little tailoring.	Some deliverables received (e.g., Revit model), but not checked. No structured review. Approval is based on "file delivered" not "fit-for-purpose."
Mama Bear *Institutionalising control*	Client develops project-specific EIRs, linked to organisational needs (OIR, AIR). BIM Execution Plans (BEPs) are reviewed and approved. Model progression matrices define Level of Information Need.	Deliverables are checked against defined LOIN. Models and data are validated (geometry, metadata, naming, classification). Tools and workflows for QA/QC are established. Model acceptance forms part of payment milestones.
Papa Bear *Strategic and embedded*	Information requirements are standardised across the organisation and aligned to asset lifecycle (CAPEX–OPEX). Specification includes interoperability, systems integration, and reuse objectives. Procurement embeds structured BIM deliverables as part of core value.	Robust model checking (manual and automated). Compliance is monitored continuously. Digital deliverables must pass validation to be accepted. Model/data performance is audited post-handover. Feedback loops inform future specifications.

Role of Procurement Culture and Mindset in BIM Maturity

Maturity Stage	Procurement Culture & Mindset	Effect on BIM Adoption
Pre-BIM	*Compliance-driven, document-based, price-focused.*Procurement sees engineering services as commoditised; BIM is unknown or considered “extra”.	BIM is ignored or seen as an unnecessary cost. Models and digital deliverables are not requested, understood, or budgeted for. Procurement reinforces siloed, fragmented information practices.
Baby Bear	*Emerging curiosity but still cost-focused.* BIM may be included because it's “in vogue” or recommended by a consultant, but there’s limited understanding of its value.	BIM is poorly specified or over-promised. Procurement cannot evaluate or enforce BIM scope, leading to inconsistent delivery. BIM is seen as an add-on rather than a value-adding service.
Mama Bear	*Outcome-aware and risk-conscious.* Procurement officers begin to understand that information is a project asset. BIM is recognised as a process that reduces risk and improves lifecycle value.	BIM is scoped more realistically. There’s better alignment between technical teams and procurement. Contracts start to include model validation, structured data deliverables, and post-handover requirements.
Papa Bear	*Value- and lifecycle-driven.* Procurement is deeply aligned with organisational goals—buying for long-term performance, reuse, and asset management. Collaboration between technical and commercial teams is normalised.	BIM is fully integrated into procurement processes. Information deliverables are scoped as part of project value. Contracts reward information quality and continuity. Digital twin readiness is a procurement driver.

Client Involvement in BIM During Project Delivery

Maturity Level	Client Role During Project	BIM-Related Behaviours
Pre-BIM *Passive recipient*	No engagement with BIM. Client focuses on cost, programme, and drawings. BIM is not a recognised scope item.	BIM models, if delivered, are ignored or not understood. No platform, skills, or interest to use them. Handover is paper-based.
Baby Bear *Informed observer*	Some client-side project managers or engineers are aware of BIM activities but remain hands-off. A BIM Execution Plan (BEP) may be signed without internal review.	Client attends coordination meetings, may observe model reviews. However, no active feedback, validation, or CDE engagement occurs. BIM is seen as "for the consultants."
Mama Bear *Active participant*	Client-side BIM or digital lead is involved in reviews, approvals, and validation. The client has internal capability to interpret and use BIM models.	The client contributes to EIR and BEP refinement, participates in model review meetings, and requires validation reports. There is an expectation of structured digital handover into systems (GIS, AM, ERP).
Papa Bear *Co-author and integrator*	Client is deeply embedded in the digital delivery process. BIM is a strategic tool for project governance, integration, and downstream use.	Client drives information coordination; models feed into digital twin platforms or operational dashboards during construction. The client validates, comments on, and tests information in real-time; project controls are linked to model status. Lessons learned from current project inform future procurement and standards.

Capacitation by Technology and Systems Across Maturity Levels

Maturity Level	Technology Capacitation	Systems Capacitation
Pre-BIM *Disconnected, paper-based*	No internal licences for BIM tools. Minimal exposure to CDEs or validation tools. GIS may exist in isolation.	No document management system. No common data environment (CDE). Infrastructure and operations run on fragmented Excel files or outdated asset systems.
Baby Bear *Pilot systems, patchy integration*	Some licences exist (e.g., Revit, Civil 3D), used on pilot projects. Cloud storage tools (e.g., OneDrive, SharePoint) may be used informally.	Basic CDEs (e.g., ACC Docs, BIM360) used on a project basis. Systems are not integrated. No automation between project data and client systems. Procurement is manual.
Mama Bear *Institutionalised tools, growing integration*	Organisation-wide licensing and training for BIM viewers/editors. Validation tools (e.g., Solibri, BIMCollab) used for model checking.	Standardised CDEs used across all projects. Document, model, and data workflows linked to internal systems (GIS, ERP, asset register). Procurement templates preloaded with digital requirements.
Papa Bear *Connected, automated ecosystem*	Advanced tools (e.g., IFC validators, issue trackers, reality capture integrations, PowerBI for BIM, digital twins) are embedded into daily work.	Seamless integration between systems: GIS ↔ CDE ↔ ERP ↔ FM/BMS. Automated QA, versioning, naming validation. BIM dashboards linked to procurement, construction, and operations workflows. Procurement is digital-by-default.

BIMCOMMUNITY AFRICA

Group Work Activity 1: “What Information Looks Like to Us”

A. What do we manage (or try to)?
   1. What types of information does your organisation produce, consume, or pay for?
      (E.g. designs, maintenance data, contracts, spatial data, audit reports, GIS layers, asset registers)
   2. Where does this information typically reside—shared drives, paper archives, contractor systems, internal platforms?

B. How is it handled?
   1. Is the information stored in a structured way, with metadata or classification?
      (Or is it just a “pile of files”?)
   2. Who (if anyone) is formally responsible for information quality, handover, or reusability in your organisation?
   3. What happens to the information after a project ends—can it be reused?

C. What challenges do you face?
   1. What stops you from managing information more effectively?
      - Skills or staffing?
      - Budget?
      - Systems?
      - Clarity of roles?
      - Policy or leadership support?
   2. Can you give an example of where poor information management caused duplication, rework, delays, or loss of value?

Group Work Activity 2: “What Needs to Change”

A. Roles and Responsibilities
1. What roles or skills are currently missing in your organisation to manage information effectively?
2. If you were to appoint one new specialist role to improve information management, what would it be—and why?

B. Procurement and Project Practice
1. How could information be better specified, procured, and handed over in future projects?
2. What should be the **bare minimum** standard for information deliverables at project close-out?
3. What would be the equivalent of “healthy data habits” in your organisation?

C. Systems Thinking
1. What are small steps your organisation could take to move away from zero-based projects and start building an information ecosystem?
2. What support would help you do this? (Policy, tools, standards, training, leadership buy-in, funding?)

D. Consensus and Commitments
1. What principle or commitment should **every organisation in the room** make today?
   (E.g. “We will not accept scanned PDFs as asset records” or “We will assign a data custodian on every major project”)

The 5 enablers of BIM Implementation

People Roles and skills required at each level—designers, contractors, consultants, and clients.

Capability development, from BIM literacy at the Baby Bear level to enterprise-wide BIM competency at the Papa Bear level.

Process Institutional procedures that must evolve to support BIM: procurement, RFP responses, project setup, and delivery workflows.

How information requirements are specified and responded to—especially critical in moving from ad hoc to governed processes.

Systems Information systems needed to manage design and construction data.

Evolution from simple file management to full lifecycle information systems that support design–construction–operations integration.

Information Types of information: geometry (2D, 3D, LOD progression), documentation, and structured asset data.

Use-case-driven discussion of the required level of detail for coordination, planning, communication, construction, and operational integration.

Emphasis on information structure, version control, and the linkage of models to asset registers, WBS, and procurement.

Technology Tools aligned to lifecycle stages: authoring, coordination, project controls, asset and facility management.

Clear message: technology does not lead, it enables. Tools deliver value only after systems, processes, and people are mature enough to support their use.

The 5 enablers of BIM Implementation across the levels of maturity

	Pre-BIM *Unstructured / Document-led*	**Baby Bear** *Foundational BIM Practice*	**Mama Bear** *Organisational BIM Maturity*	**Papa Bear** *Enterprise-level BIM Integration*
People	No BIM awareness or formal roles. Project teams rely on CAD staff and traditional PMs.	BIM roles assigned informally at project level (e.g. BIM modeller or coordinator). Teams have basic BIM understanding.	BIM roles defined in job descriptions. Staff receive structured training. BIM capability is managed across teams.	Enterprise roles formalised (e.g. Information Manager, Digital Delivery Lead). BIM career paths, performance targets, and in-house academies exist.
Process	Information is exchanged via email or USB. No modelling protocols or digital delivery requirements.	Basic BEP developed at project level. File naming, model deliverables, and WIP/Shared/Published workflow adopted.	Standardised BEPs and EIRs are used across projects. QA/QC processes support model review and approval.	Digital delivery is fully embedded in organisational governance. BIM processes integrated with procurement, QA, operations, and compliance.
Systems	Files stored manually (shared drives, personal folders). No CDE. Version control is manual.	A basic CDE is used to separate WIP, Shared, and Published data. Model access is centralised and controlled.	CDE used consistently across the organisation. Access control, workflow approvals, and metadata management in place.	Enterprise-level system integration (CDE, ERP, GIS, CMMS, SCADA). Live data exchange supports decision-making and automation.
Information	Project data is unstructured, disconnected, and undocumented. Models, if present, are visual only.	Models are delivered with LOD 200 geometry and basic metadata. Information is traceable, structured, and reviewed internally.	Models and documentation are structured and classified. Data is aligned to asset register, cost breakdowns, and maintenance planning.	Information is fully structured, validated, and delivered in interoperable formats (IFC, COBie, etc.). Asset data supports operations, finance, and analytics.
Technology	Tools limited to 2D CAD and PDFs. No coordination or model review tools used.	Authoring tools (e.g. Revit, Civil 3D) used for model creation. Free viewers or lightweight coordination tools adopted.	Coordination, quantification, and validation tools (e.g. Navisworks, BIM Track, Solibri) used in delivery workflows.	Integrated toolchain for 4D/5D/6D BIM, digital twins, dashboards, IoT platforms, asset monitoring, and lifecycle optimisation.

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Question: *"In your organization or project environment, what are the key skills or roles currently missing that limit your ability to adopt or scale BIM practices, and how might you begin to develop or source those capabilities?"*

💬 *Consider both internal team development and collaboration with external specialists.*

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Question: *"What internal processes—such as procurement, project setup, or quality control—would need to change in order to clearly define and manage BIM-related deliverables on your projects?"*

💬 *Reflect on how you currently set expectations for information and whether they are aligned with project outcomes.*

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Question: *"What systems (software or platforms) are you currently using to manage project information, and how well do they support structured collaboration across disciplines and lifecycle stages?"*

💬 *Discuss the gaps between file storage and true information management. What does 'fit for purpose' look like at your current stage?*

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Question: *"How do you currently structure and control the different types of information on your projects—models, drawings, documents, and asset data—and what challenges have you encountered in ensuring quality and traceability?"*

💬 *Explore whether you are using consistent naming, version control, data validation, and asset tagging.*

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Question: *"Which technologies or digital tools have added the most value to your project delivery so far, and what would it take for your organization to get more value from these or newer tools?"*

💬 *Think about technology adoption not just as tool selection, but in terms of readiness, training, integration, and process alignment.*

People: “In your organization or project environment, what are the key skills or roles currently missing that limit your ability to adopt or scale BIM practices, and how might you begin to develop or source those capabilities?”

💬 Consider both internal team development and collaboration with external specialists.

Process: “What internal processes—such as procurement, project setup, or quality control—would need to change in order to clearly define and manage BIM-related deliverables on your projects?”

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Systems: “What systems (software or platforms) are you currently using to manage project information, and how well do they support structured collaboration across disciplines and lifecycle stages?”

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- "Data is the new oil”
- “…It's valuable, but if unrefined it cannot really be used. It has to be changed into gas, plastic, chemicals, etc., to create a valuable entity that drives profitable activity; so must data be broken down, analyzed for it to have value."

  - CLIVE HUMBY & MICHAEL PALMER