



BIMCOMMUNITY
AFRICA



Better Information Management

... and digital project delivery

Non-Profit Company

*When the tide comes in...
... all the boats rise*





BIM COMM UNITY AFRICA

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

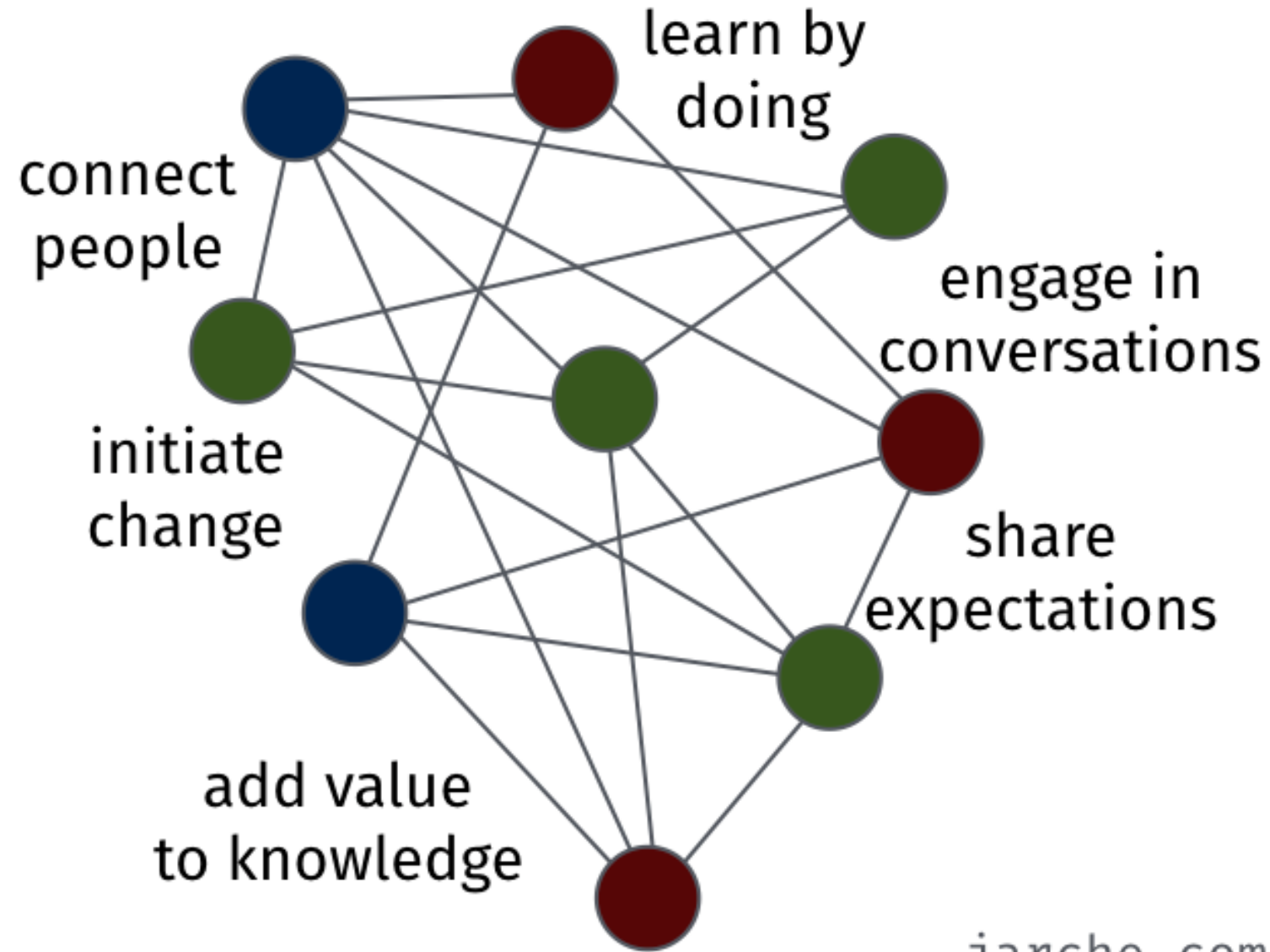


Raise the BIM Tide

- Conferences to Create Awareness
- Encourage participation and connect people with each other
- Technical workshops about the practicalities of BIM on all levels



Making
the (BIM)
network
smarter



jarche.com

COLLABORATIVE BIM IMPLEMENTATION ESTABLISHING BEST PRACTICE GUIDELINES FOR DIGITAL INFRASTRUCTURE DELIVERY IN SOUTH AFRICA

The BIMCommunityAfrica held its 5th Convention for a Digital eSouth Africa (CoDE•SA) in October 2024 under the theme “Building the Machine – practical solutions towards digital transformation of the Engineering and Built Environment.”

This set the stage for transformative digital adoption in South Africa's construction industry. **By Amanda Filtane and Richard Matchett, BIMCommunityAfrica**

The focus was clear: to “build the machine” for effective BIM implementation. Three pivotal priority areas need to be addressed, namely policy, process, and technology. These are all interconnected and essential components of the machine for achieving a cohesive and future-ready built environment that can adapt to digital project delivery practices. Digital infrastructure efficiencies are essential for South Africa to drive economic growth, manage urbanisation, and improve sustainability.

The country's infrastructure sector, critical for development, often faces delays and cost overruns due to outdated processes. Continued demand for efficient infrastructure, and digital solutions like BIM enable better planning, delivery and operations through resource optimisation and virtual simulations models. Implementing sustainable practices is also crucial for South Africa, as digital tools aid

in the lifecycle management and maintenance of assets.

Therefore, the purpose of the convention, through guided conversations, engagements, International Standards and best practice examples, was to collectively map out the specific requirements to realistically support BIM adoption going forward.

Skills, staffing, professionalisation and standard reform (Policy field)

Addressing the skills gap is fundamental. Research shows that a significant barrier to BIM adoption in South Africa is the shortage of qualified personnel and training opportunities. Studies highlight that firms often lack structured BIM education and professional development pathways, which limits their ability to integrate digital processes effectively. As seen in global best practices, formal certifications and competency frameworks are essential to professionalise and standardise BIM skills within the industry.

Establishing continuous training programmes and aligning them with academic curricula will create a consistent pipeline of BIM-ready professionals. This

integration ensures the construction workforce is not only familiar with BIM tools, but also adept at utilising them in practical settings.

Policies must also be updated to incorporate BIM practices into municipal standards and project procurement processes. By mandating BIM in municipal projects, municipalities can lead by example, demonstrating the efficiency and transparency that digital processes bring. Engagement with regulatory bodies like the Construction Industry Development Board (CIDB) will be pivotal in setting these standards and gaining industrywide buy-in for policy changes.

Clients, asset owners and facilities managers: Collaborative contracting and procurement requirements (Process field)

Collaboration is another cornerstone for BIM's success. Contractual frameworks need to evolve to accommodate digital information sharing, enabling a collaborative environment where asset managers, facility managers, designers, and contractors work seamlessly. Evidence from local studies suggests that current procurement processes are not aligned with the demands of digital integration, making it necessary for clients to specify BIM requirements in project tenders and contracts.

Information management and open libraries (Technology field)

Shared information resources, including open libraries of digital content tailored to South Africa's needs, are crucial for scaling BIM. Establishing an open library would standardise information and improve consistency across projects, reducing rework and enhancing efficiency. Information management must also

align with best practices to ensure data is accessible, interoperable, and reliable.

To truly build a functional “machine” technological frameworks need to prioritise interoperability and open-source approaches. This ensures that different software platforms can communicate, reducing silos and enabling cohesive project management. An emphasis on open libraries will also support localised content creation, enhancing the relevance of digital models to South African contexts.

Action plan: Working groups and collaborative efforts

The convention concluded with the establishment of working groups to focus on each priority area. These groups will produce tangible outputs by the next meeting in March 2025. To ensure wider participation and industry alignment, awareness letters will also be sent to relevant organisations – public and private, councils, as well as clients, to garner support and an action agenda towards South Africa's digital (BIM) transformation.

Conclusion

The BIMCommunityAfrica's strategic approach aligns with international best practices while



Effective BIM implementation requires addressing three pivotal areas, namely process, policy, and technology

For further information, contact angela@bimcommunity.africa

Raising the BIM tide **BIMCOMMUNITY AFRICA**



Dr Amanda Filtane, Lecturer,
Department of Construction
Economics and Management,
University of Cape Town



Richard Matchett,
Lead: Digital at Zulusi

tailoring solutions to South Africa's unique context. By addressing skills development, aligning procurement processes, and establishing a foundation for shared information management, we are collaboratively setting the stage for a digitally transformed and efficient construction industry.

The progress made through these conventions and subsequent actions is documented and shared via the BIMCommunityAfrica website (www.bimcommunity.africa/bimcodesa), providing a platform for ongoing learning and development across the industry.

The strength of the collective voice within BIMCommunityAfrica is instrumental in driving industrywide transformation through the BIM CoDE•SA initiative.

With participants including clients, consultants, contractors,

regulatory bodies, researchers, educational institutions, and voluntary associations, the initiative encompasses the full spectrum of industry expertise and perspectives. This collaborative and inclusive environment enables the co-creation of best practice guidelines that are comprehensive and responsive to the needs of all stakeholders.

By uniting such a diverse range of voices, as an open, sharing organisation, BIMCommunityAfrica ensures that the standards and methodologies developed are practical, evidence-based, and aligned with the realities of the South African construction landscape. This collective engagement builds momentum, setting the foundation for the widespread adoption of digital practices and fostering excellence in infrastructure design, delivery and operations. ■

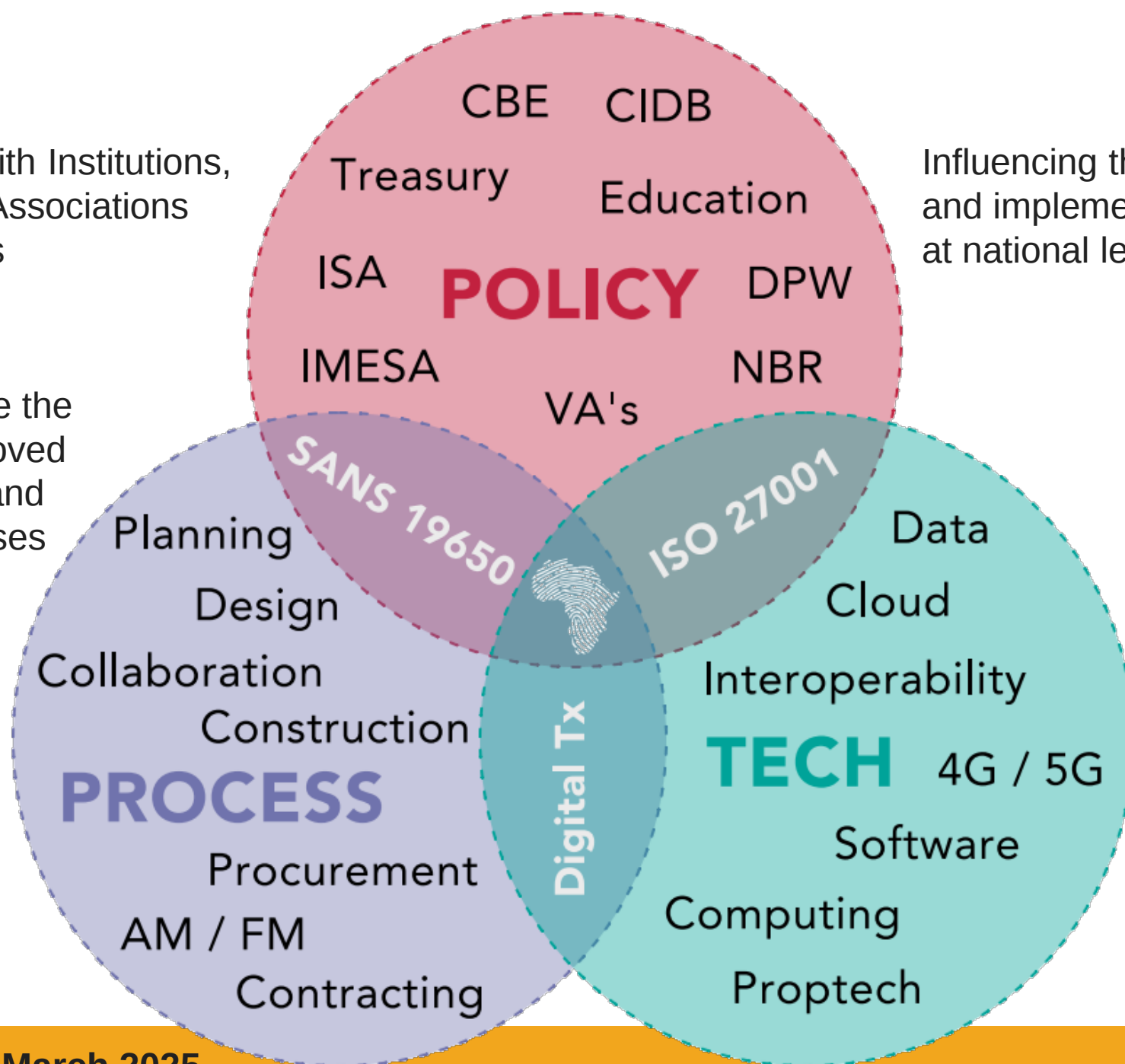


Partnering with Institutions,
Authorities, Associations
and Councils

Influencing the creators
and implementers of policy
at national level

Collaborating to guide the
development of improved
information delivery and
management processes

Engaging with
the vendors and
producers of
technology



Lack of cohesion and
engagement in the
private sector



Collaborative
private sector

No Government
drive



Strong Government
support and mandates

Limited engagement
from Professional Bodies



An integrated
Professional Bodies
approach

Outdated academic
programmes



Academic programmes
which reflect
current practices

Historical briefs
and processes



Future-focused briefs,
processes and systems

Absence of
cross-industry organisms



Flourishing
cross-industry initiatives

Lack of new regulations



Regulations aimed at
reflecting and supporting
development needs

Erratic skills levels



Continuous skills
development and
knowledge share

Introductions:

Hi, my name is ...

I work at / for

My interest in this workshop is

B

Building

Better

I

Information

Information

M

Modelling

Management

Health and Safety Stats

Change Management

Cost models

Information Standards

Organisation KPIs

Predictive Maintenance

Sustainability goals

Project requirements

Maintenance schedules

Energy Performance Certification

Information... so much to think about!

Asset Registers

Engineering specifications

Knowledge Management

ESG reporting

Project planning

Enterprise management

Facilities management



<https://insights.regenesys.net/>

1.0

- ◆ **1780 – Mechanisation**
Industrial production based on machines powered by water and steam

2.0

- ◆ **1870 – Electrification**
Mass-production using assembly lines

3.0

- ◆ **1970 – Automation**
Automation using electronics and computers

3.5

- ◆ **1980 – Globalisation**
Offshoring of production to low-cost economies

4.0

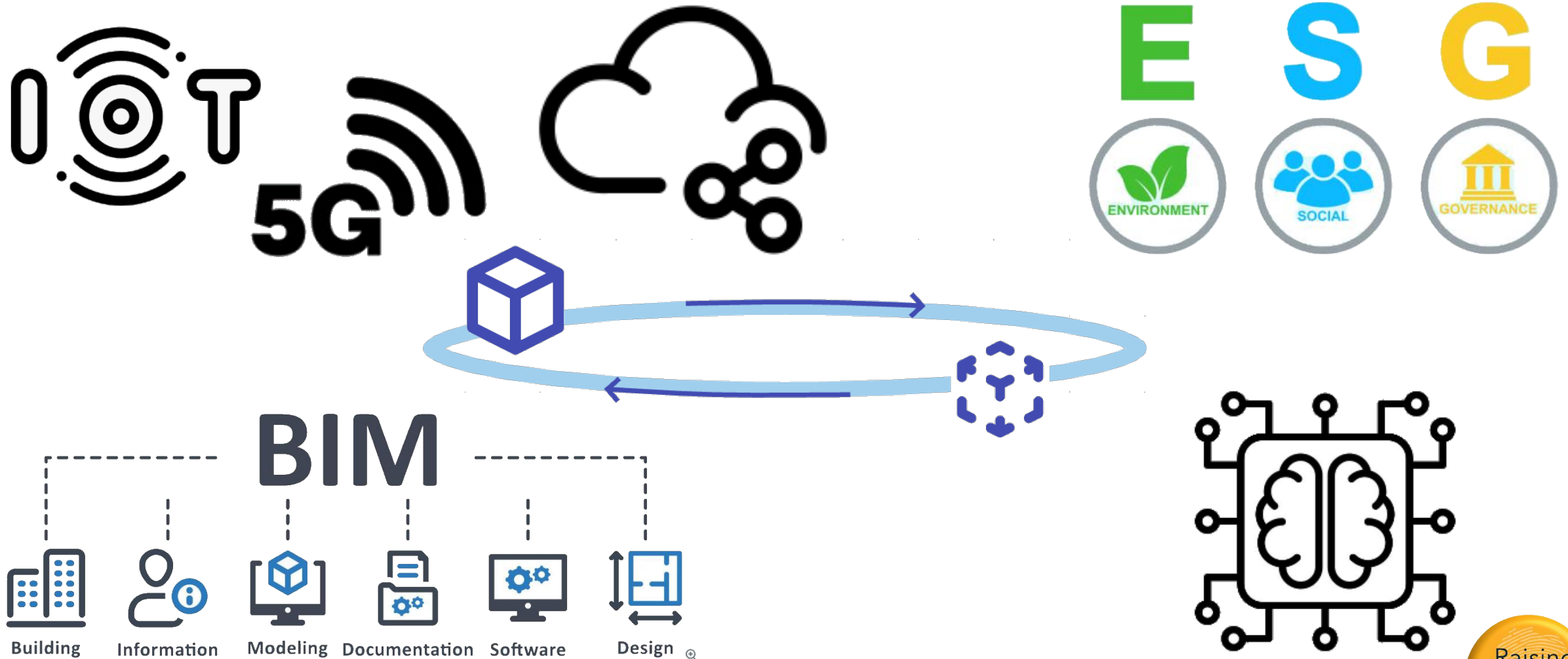
- ◆ **Today – Digitalisation**
Introduction of connected devices, data analytics and artificial intelligence technologies to automate processes further

Digitalisation

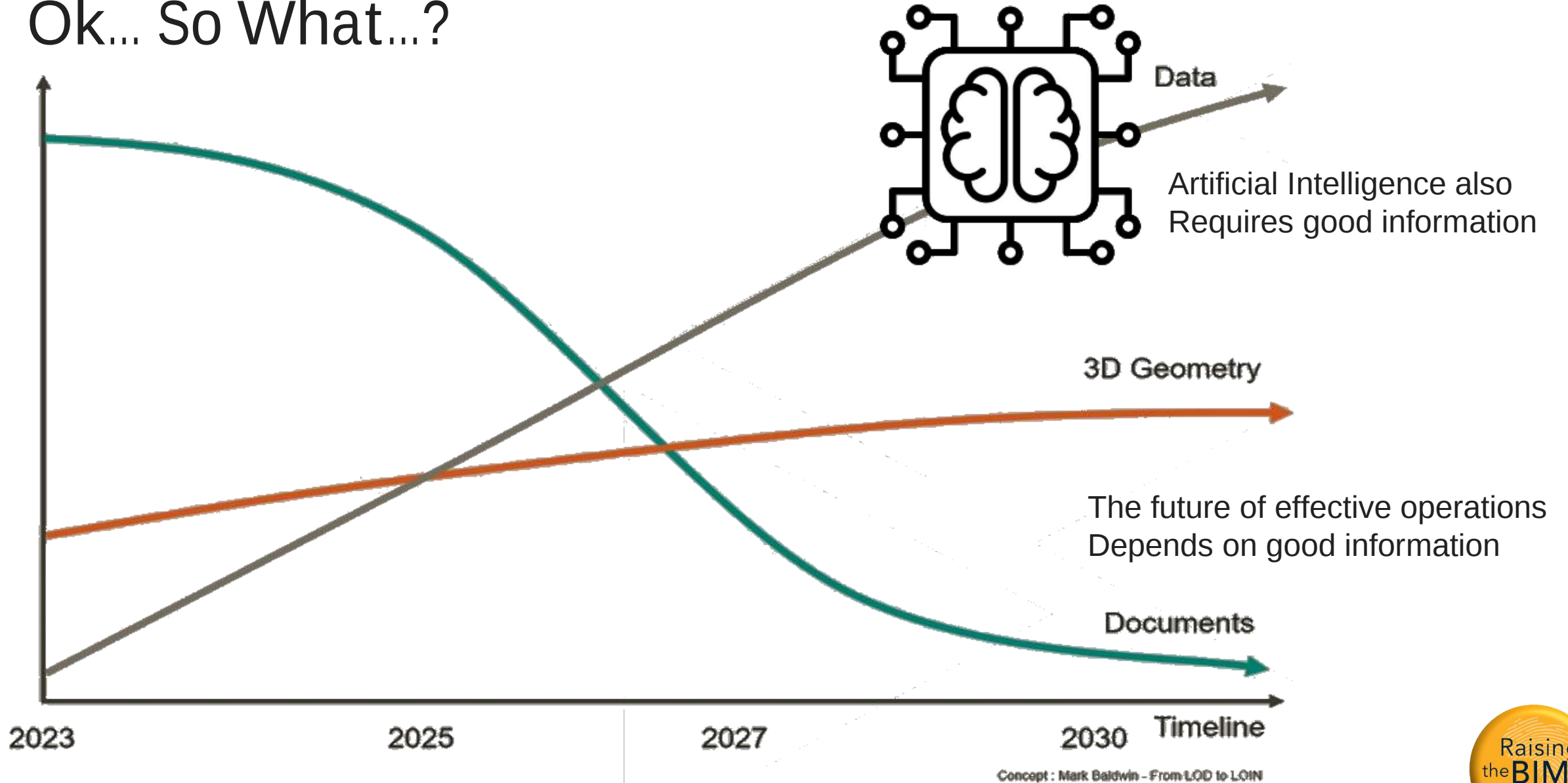
5.0

- ◆ **Future – Personalisation**
The fifth industrial revolution, or Industry 5.0, will be focused on the co-operation between man and machine, as human intelligence works in harmony with cognitive computing. By putting humans back into industrial production with collaborative robots, workers will be upskilled to provide value-added tasks in production, leading to mass customisation and personalisation for customers

Key Trends driving the change



Ok... So What...?



The uncomfortable truth....





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

The SANS19650 process and its role in bridging between design, construction and operation in the Built Environment(s).

The SANS19650 process and its role in bridging between design, construction and operation in the Built Environment(s).

What is SANS 19650?

What is the SANS 19650, and what does it say about construction and BIM?



SANS 9001 ensures that project deliverables meet quality standards

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

ISO 21500 provides guidance on project management

SANS 19650 enhances collaboration among stakeholders through standardized BIM practices.

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.

SANS 19650 in a nutshell



- Define agreed information objectives (owner, operator, employer)
- Integrate the information objectives into the planning and procurement stages
- Plan and execute the project and create the digital deliverables and construct the physical assets simultaneously
- Commission and handover BOTH the physical and the virtual assets.

SANS 19650 is all about information

Outcomes based approach

- Define agreed information objectives (owner, operator, employer)
- Integrate the information objectives into the planning and procurement stages
- Plan and execute the project and create the digital deliverables and construct the physical assets simultaneously
- Commission and handover BOTH the physical and the virtual assets.

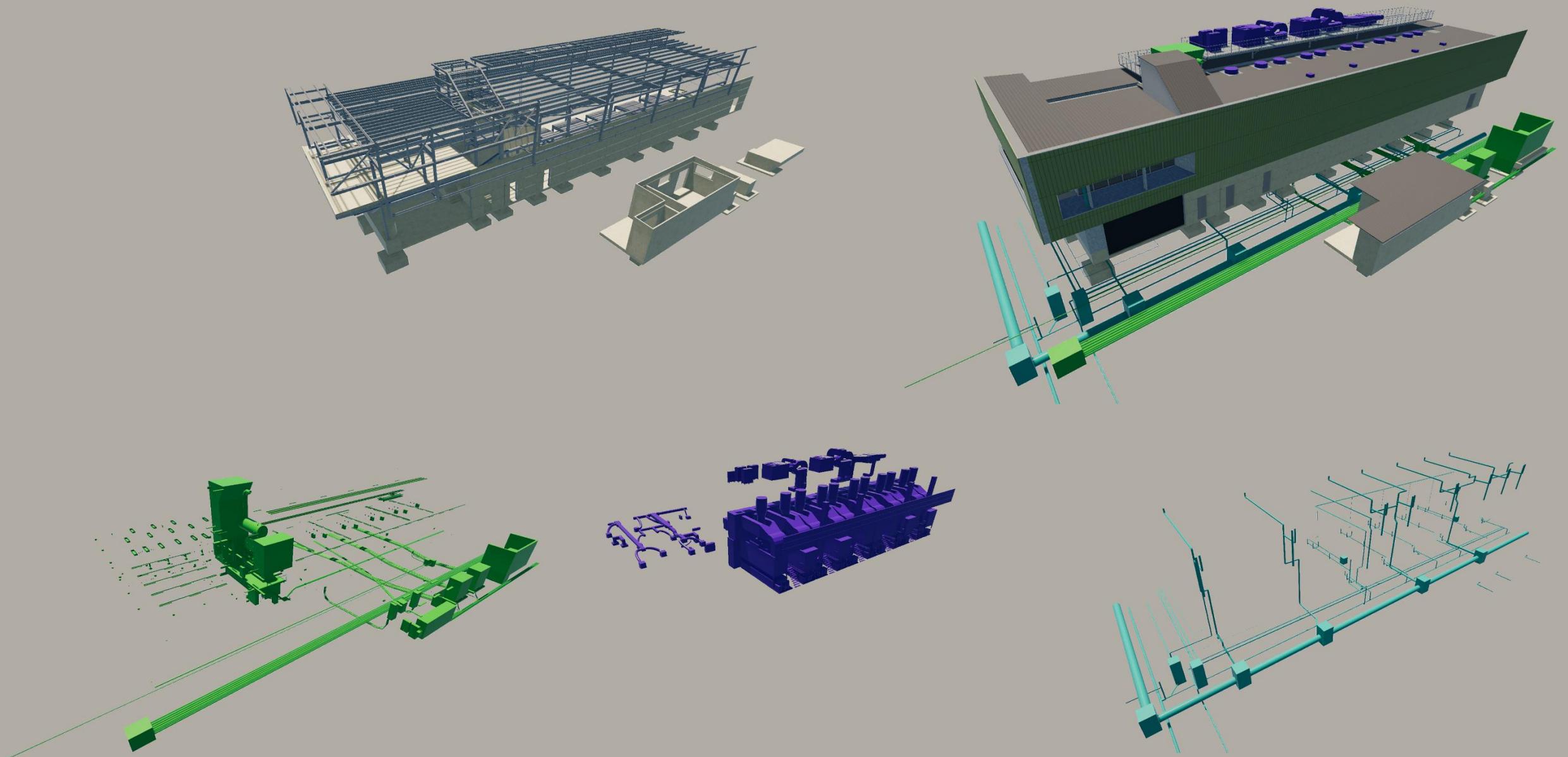
Possible Examples...

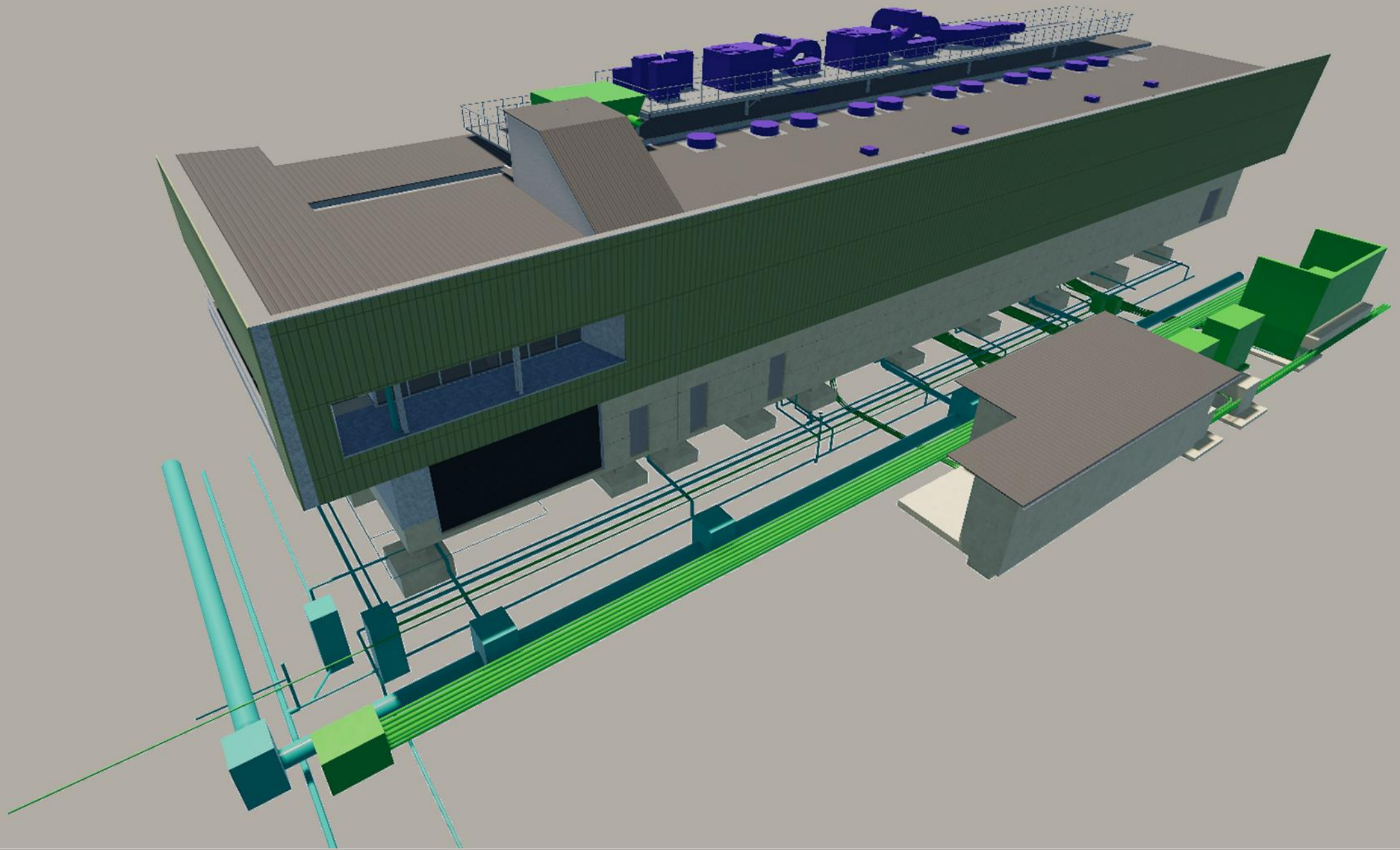
- ✓ *Need: Information exchange triggers*
- ✓ *Need: FM-led technical specs*
- ✓ *Need: Operations ready hand-over information*
- ✓ *Information Requirement in Tender Docs,*
- ✓ *Common Data Environment ready,*
- ✓ *Proven capability and capacity to deliver*
- ✓ *Delivery Team follows agreed Execution Plan*
- ✓ *Work consistently and collaboratively*
- ✓ *Information quality checks prioritised*
- ✓ *Information exchange centralised and traced*
- ✓ *Review and accept the Project Information (PIM)*
- ✓ *Integrate the PIM into the Asset Information Model*

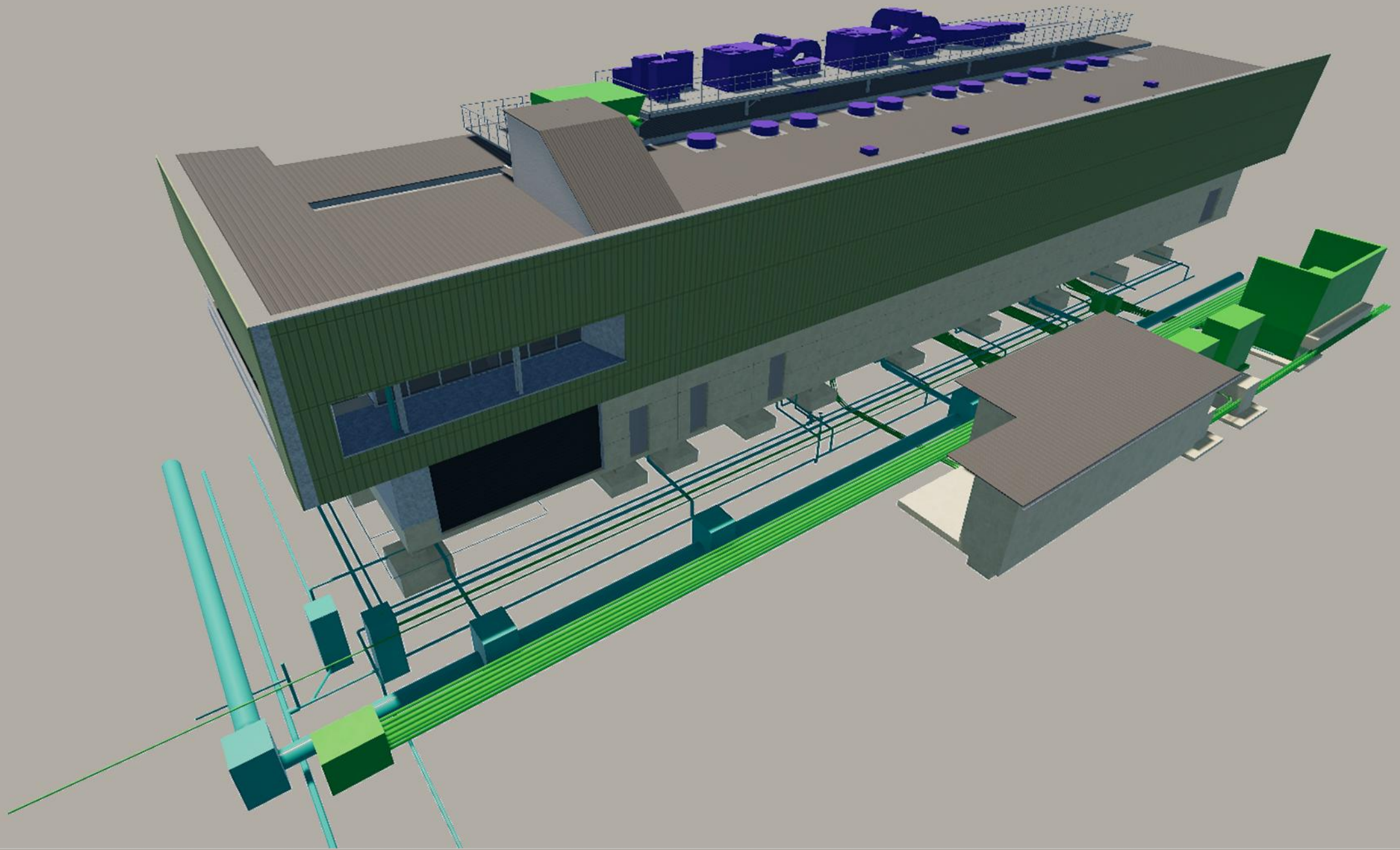
The SANS19650 process and its role in bridging between design, construction and operation in the Built Environment(s).

What is SANS 19650?

How is info. created in design and construction?







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

level = LOWER GROUND

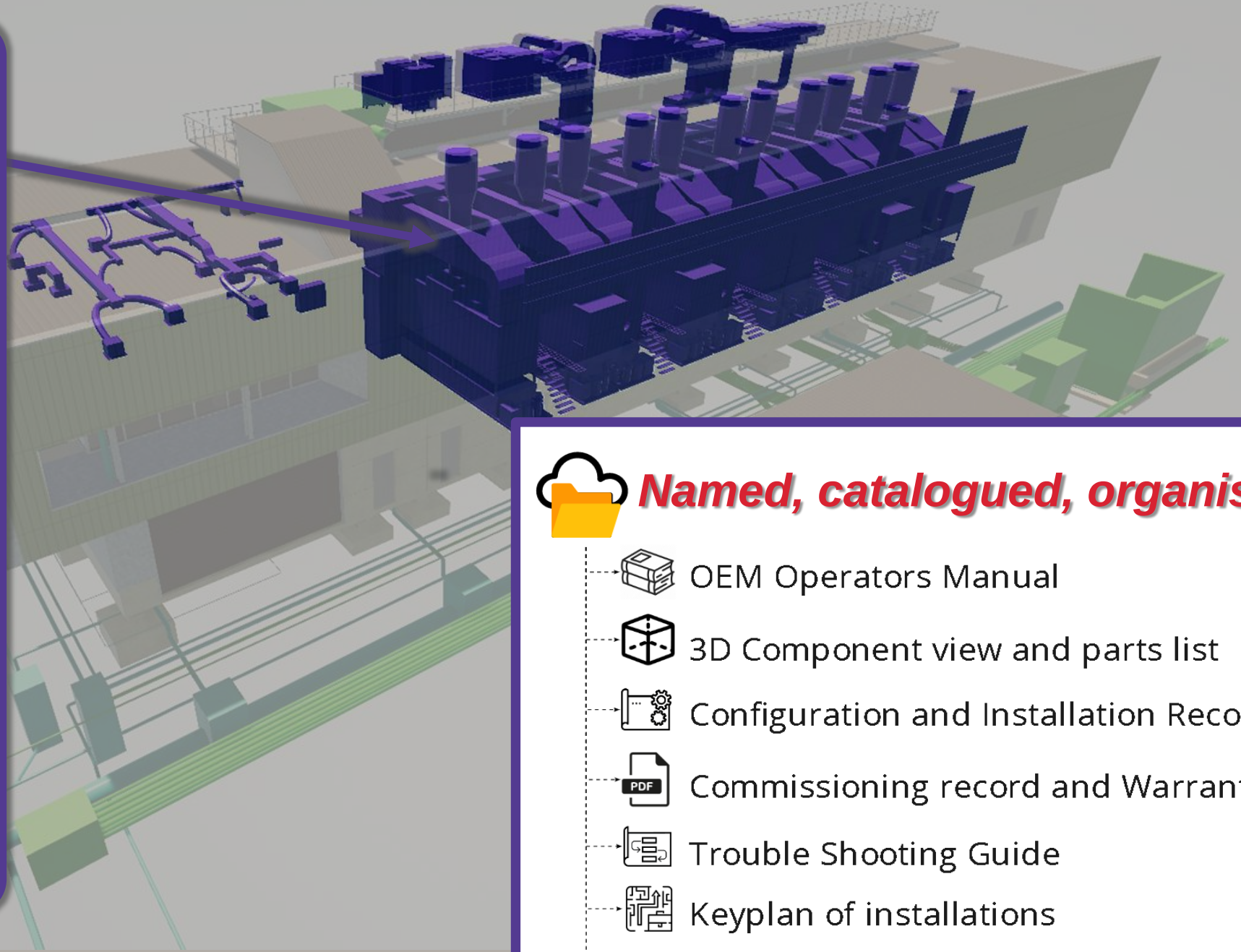
Type Mark = IEC

Mark = 01-01

Aur_Ref = IEC

Actual Supply Air Flow = 0.0 L/s

Actual Return Air Flow = 0.0 L/s



Named, catalogued, organised



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

Lifecycle Optimisation

The Development Cycle

Growth of Knowledge

Facilities Management

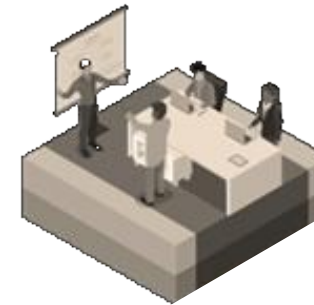
Occupation and
Operations

Commissioning

Construction

Procurement

Planning



Conceptual
Design

Design and
Engineering

Lifecycle Optimisation

Owner, Consultants

CAPEX stage to OPEX Stage

The changing players

Facilities Management

FM Contractor

Occupation and
Operations

*Owner, Operator
Tenants*

TRANSITION

Commissioning

*Main Contractor + subbies
Principal Agent
Engineering Consultant*

Construction

*Main Contractor + subbies
Principal Agent
Engineering Consultant*

Procurement

*Owner's Procurement
Professional Team*

Design and
Engineering

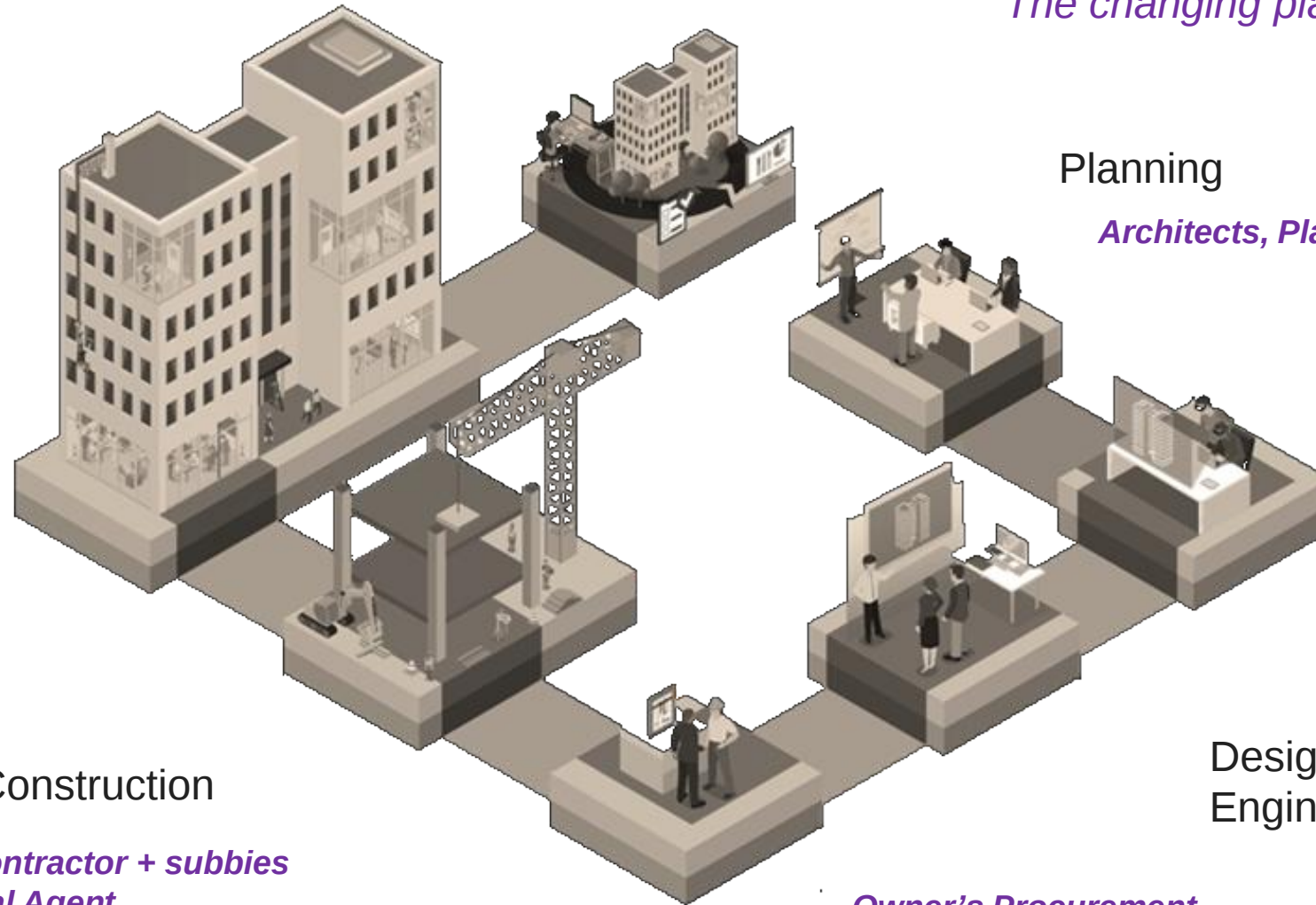
*Architects,
Engineers*

Conceptual
Design

*Architects,
Engineers*

Planning

Architects, Planners



Facilities Management

Rapid response
Proactive Maintenance
Tenant care and service
Workforce Management

Asset Management

Portfolio Management
Data driven decisions
Management of changes
[where is the info?]
Expansion, modification,
Repurpose, demolish

Lifecycle Optimisation

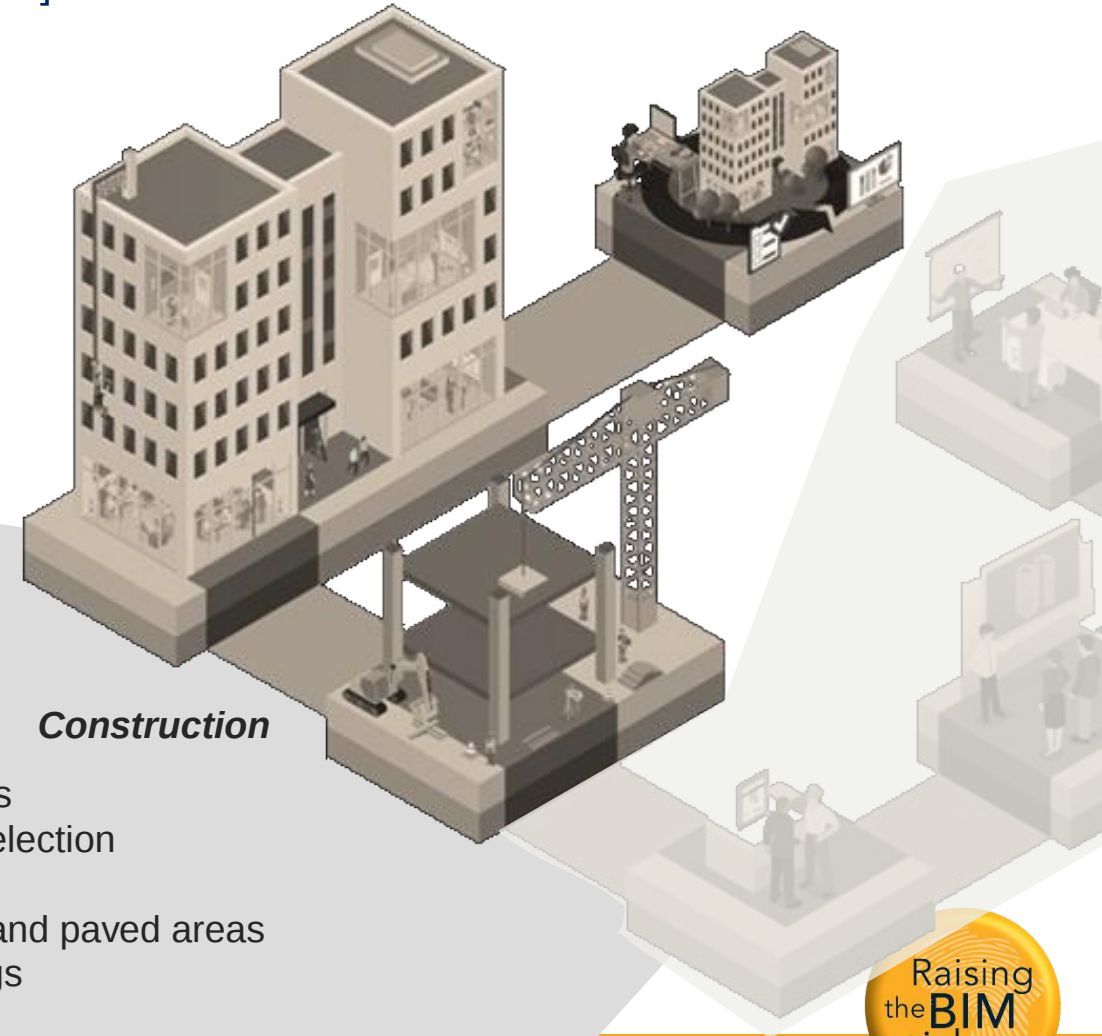
LEED / BREEM Ratings
Regulatory requirements
ROI of investment



BIMCOMMUNITY
AFRICA

Occupation & Commence Operations

Asset Information



TRANSITION

Hand-over Documentation



Commissioning

As-Built Records
Survey data and drawings
Taking over certificates
P&ID of Plant and equipment
OEM Manuals & Warrantees



Supervise, witness, accept

Shop Drawings vs Design intent
Required changes, queries, amendments
Final equipment, material and finishes selection
Detailed installation by trades,
Utilities buried, covered by landscaping and paved areas
Services covered by cladding and ceilings

Construction

Raising
the **BIM**
tide

Asset Information = 2D,3D, docs and data



Named, catalogued, organised

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



The SANS19650 process and its role in bridging between design, construction and operation in the Built Environment(s).

What is SANS 19650?

How is information created in construction?

It's a team effort, according to SANS 19650

Who are the key people involved in construction and operations?

Key
Stakeholders



Corporate
Management



Asset
Managers



Asset
Operations



Project
Managers



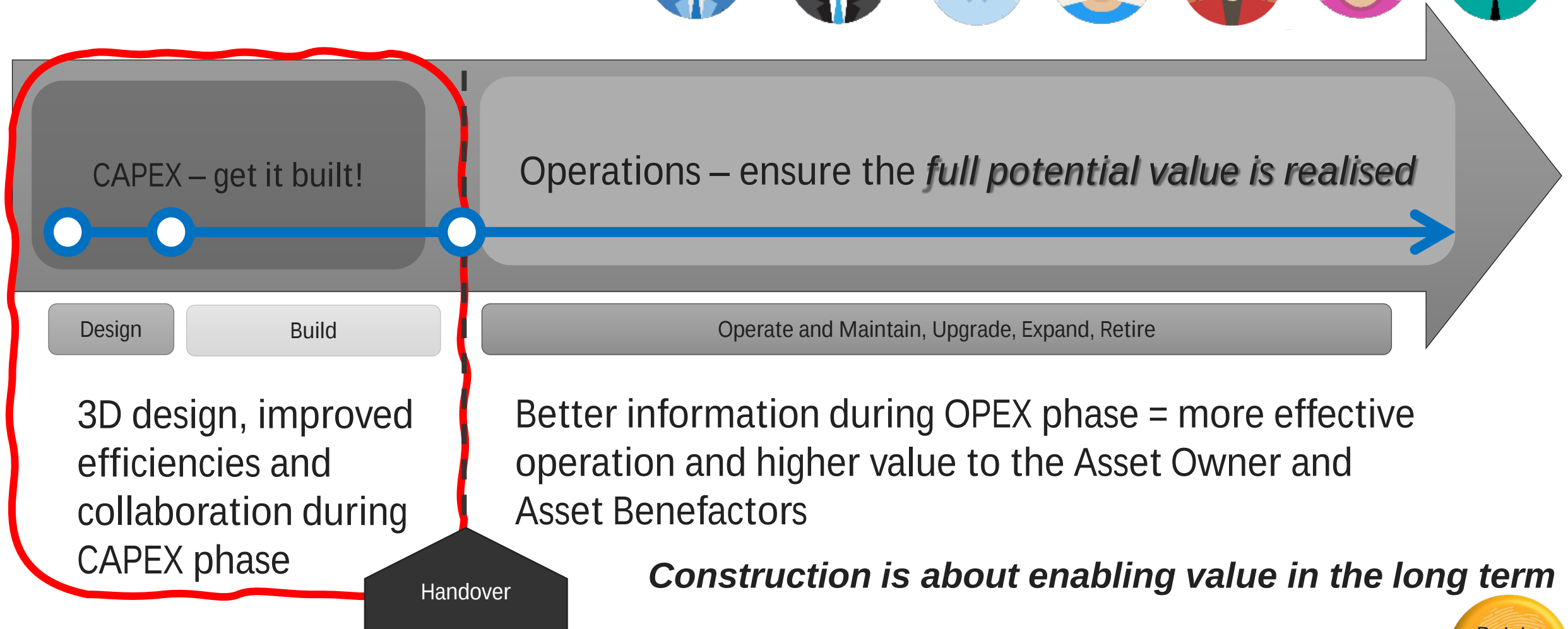
Professional
Team



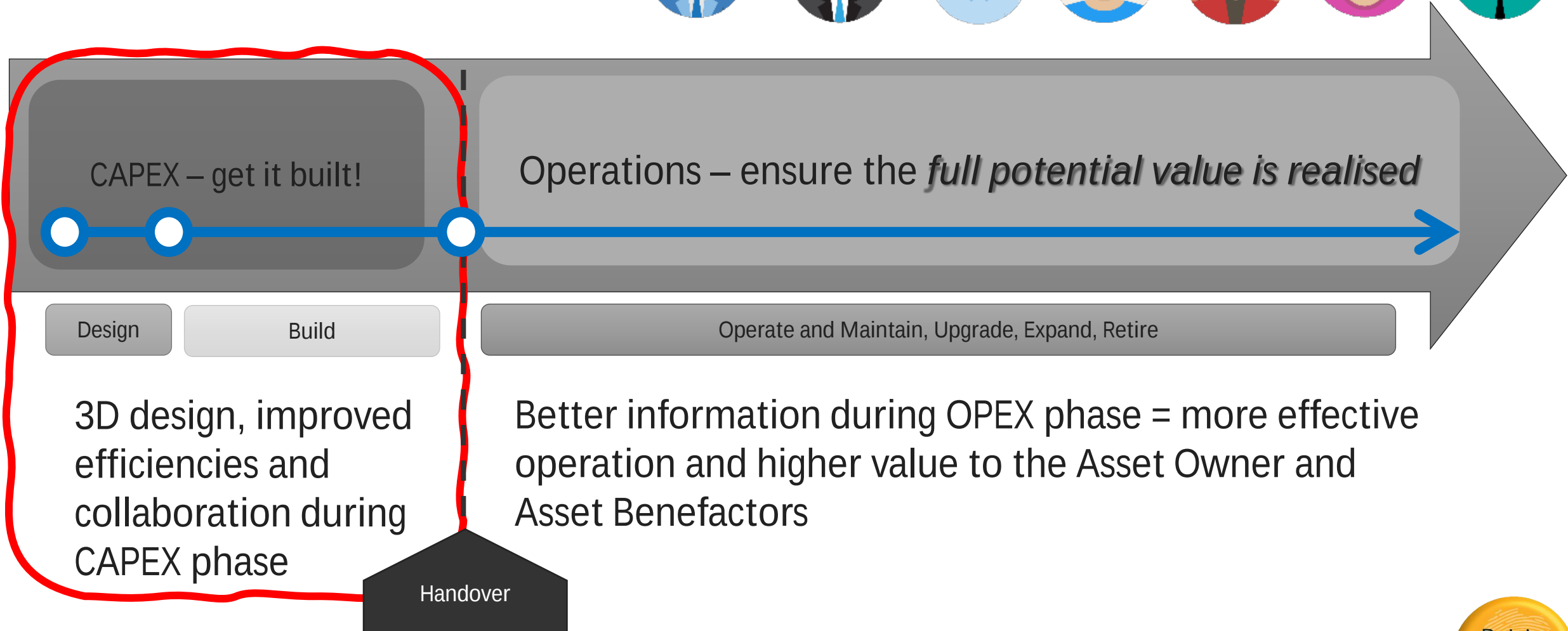
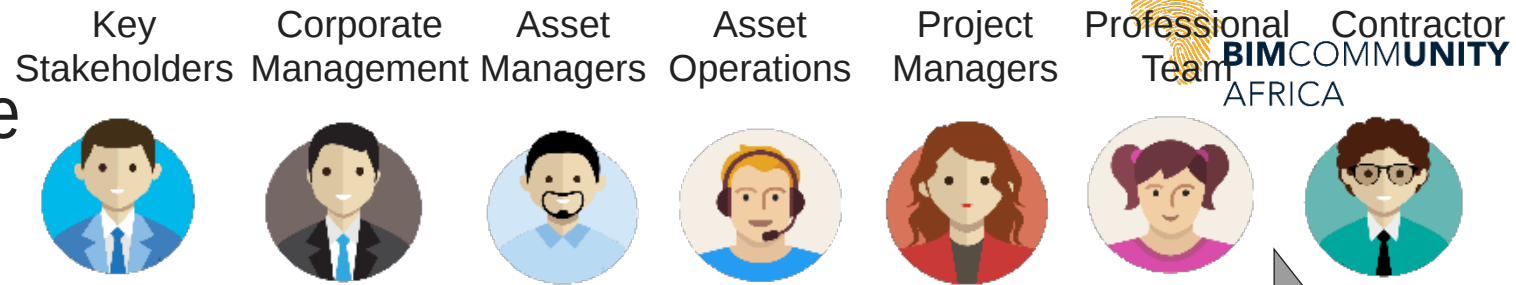
Contractor



What is Construction about?



How does the ISO impact the way we deliver projects?



Key Stakeholders Corporate Management



Project Managers



Professional Team



BIM COMMUNITY AFRICA 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...

Really?

Asset Managers



Asset Operations



And ours too!

Key Stakeholders



Corporate Management



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

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 BIM COMMUNITY AFRICA Contractor



Define the Organisational Information Requirements



Project Information Requirements

Define Asset Information Requirements



Asset Managers Asset Operations



CAPEX – get it built!

Operations – ensure the *full potential value is realised*

Design

Build

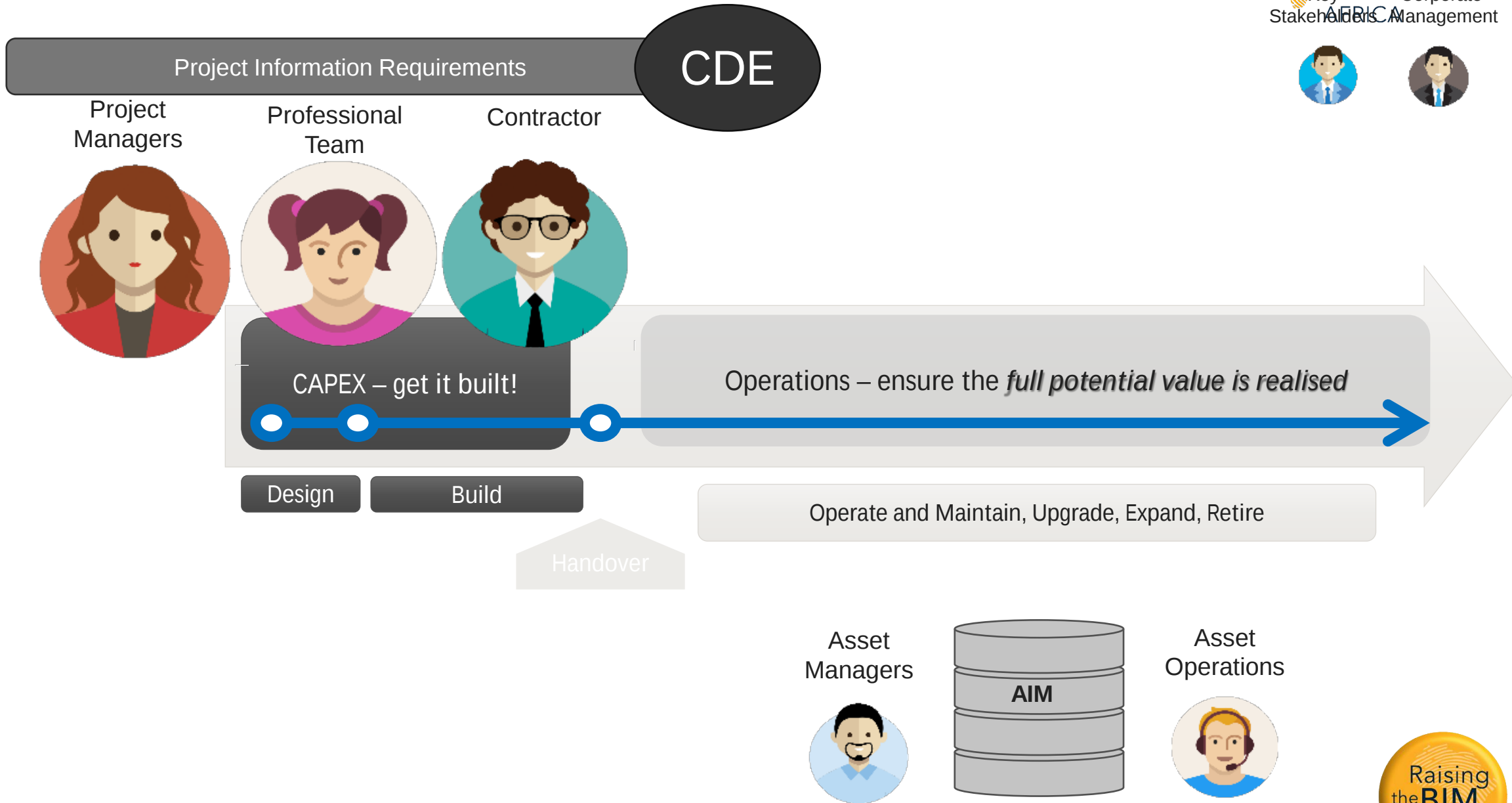
Handover

Operate and Maintain, Upgrade, Expand, Retire

Incorporate lessons learned and knowledge gained from operations

AIM







Project Managers



Professional Team

Contractor



Asset Operations



CAPEX – get it built!

OPERATIONS – ensure the *full potential value is realised*

Design

Build

Operate and Maintain, Upgrade, Expand, Retire

Handover

CDE

Project Information Requirements

PIM

Asset Managers

AIM

You need collaborative teams, following collaborative processes

Key
Stakeholders



Corporate
Management



Asset
Managers



Asset
Operations



Project
Managers



Professional
Team
BIMCOMMUNITY
AFRICA



Contractor
Team



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

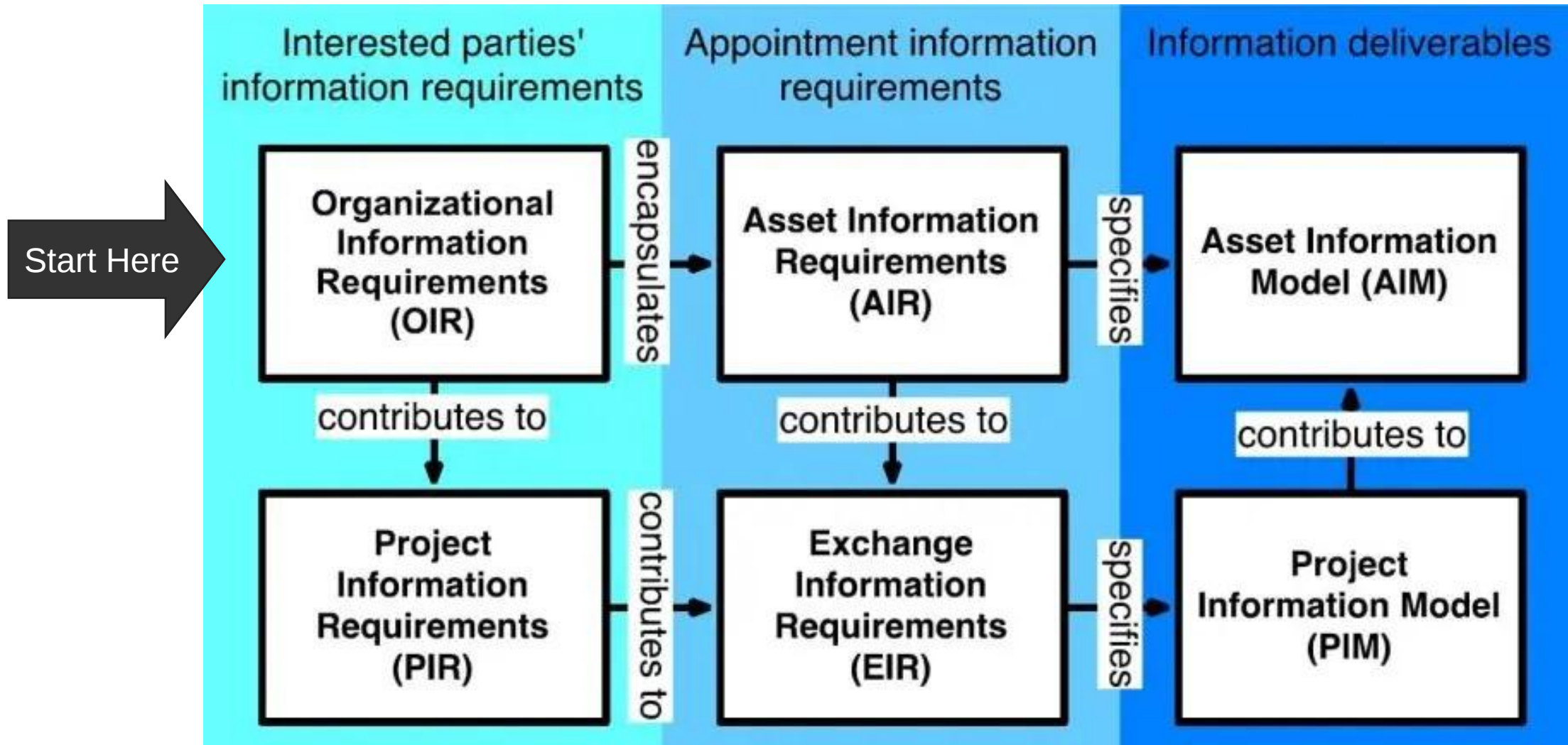


Discussion Point :

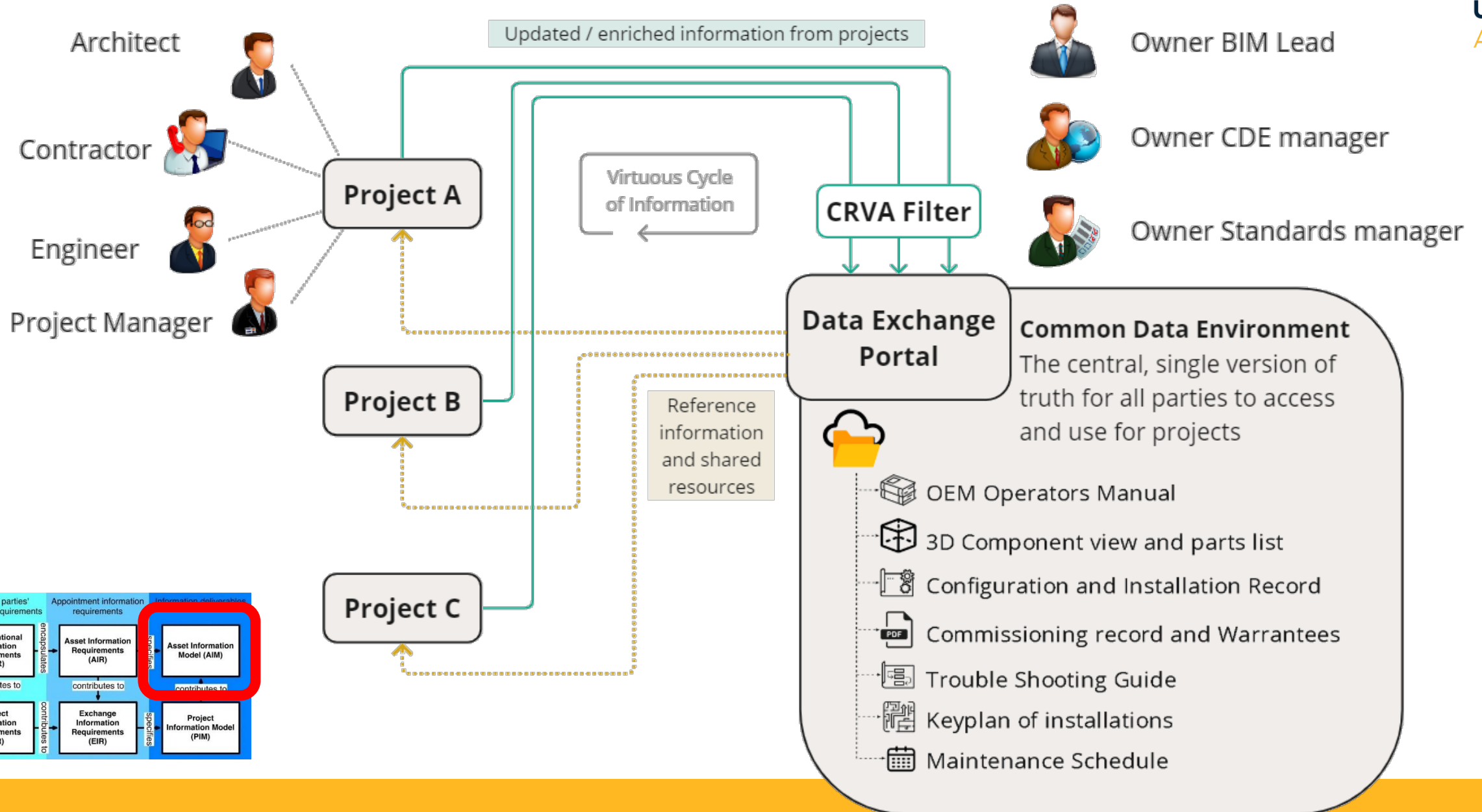
In my line of work, when it comes to infrastructure
and the built environment,

The most important information is

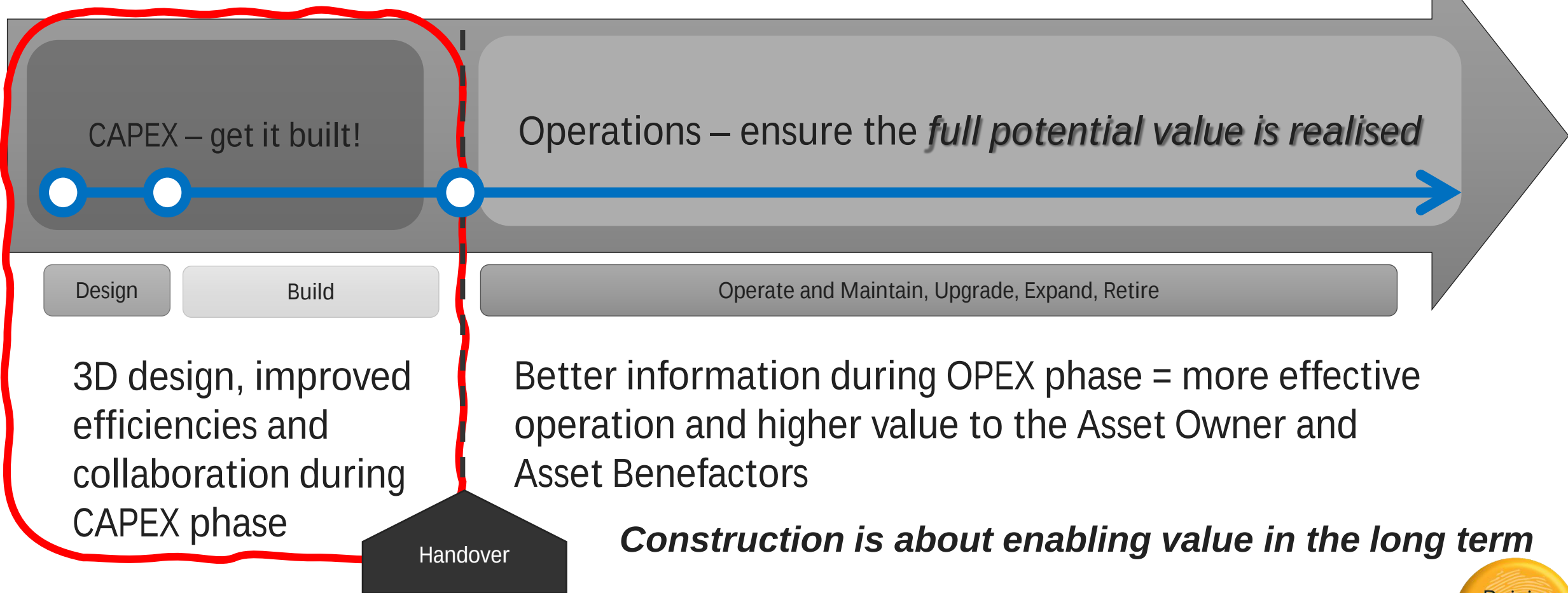
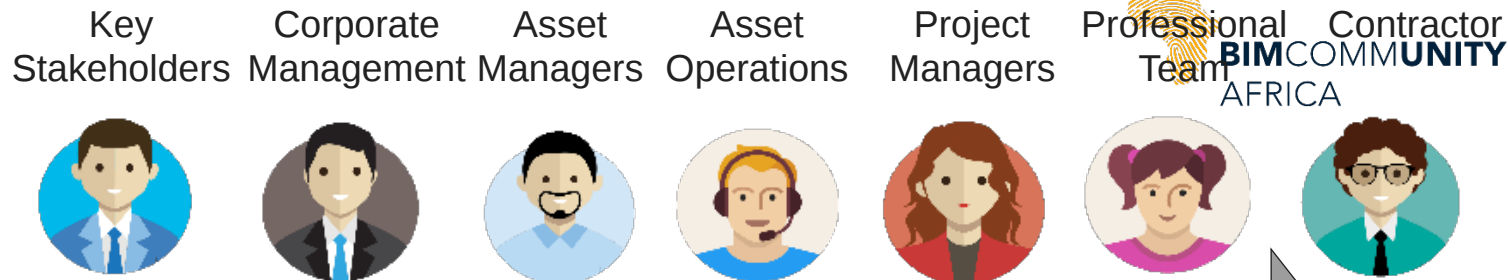
Paint by Numbers... according to SANS19650



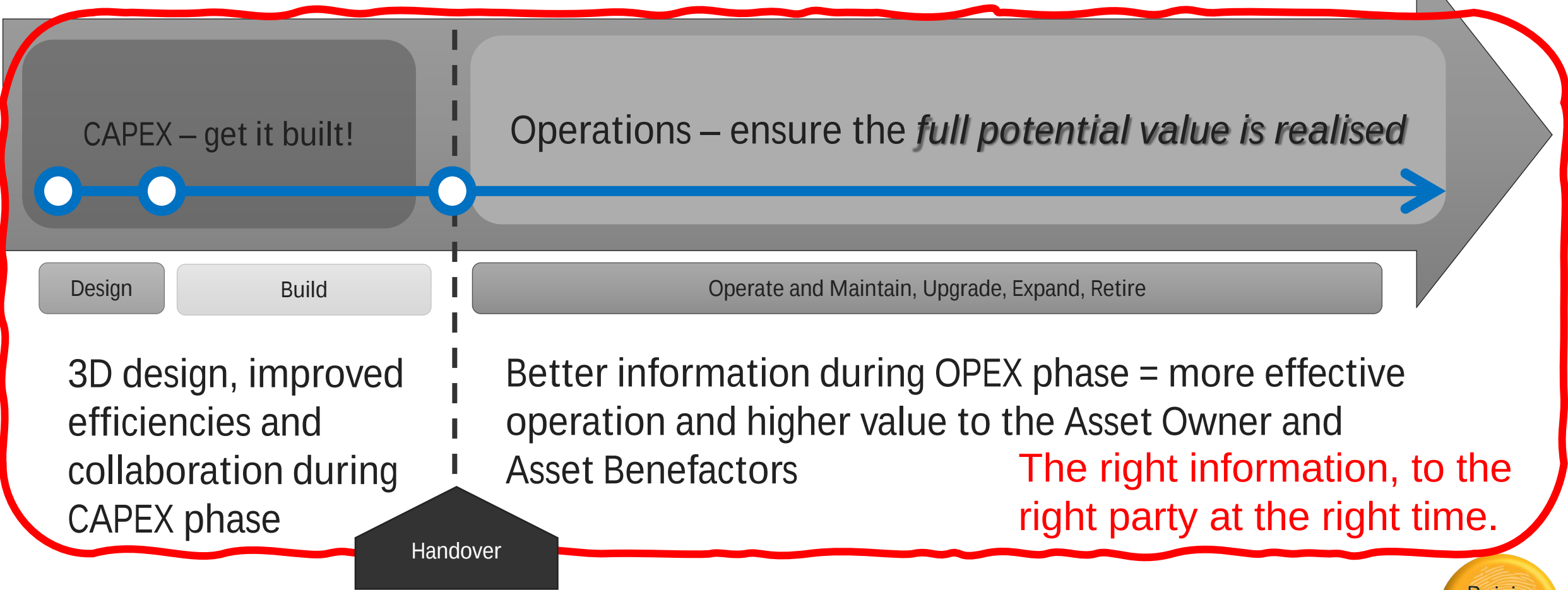
The Client's CDE



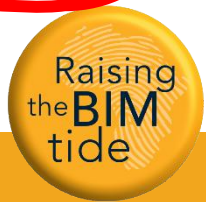
That's how BIM delivers better value



That's how BIM delivers better value



Construction is about enabling value in the long term



B

Better

I

Information

M

Management

The Theory....



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

level = LOWER GROUND

Type Mark = IEC

Mark = 01-01

Aur_Ref = IEC

Actual Supply Air Flow = 0.0 L/s

Actual Return Air Flow = 0.0 L/s



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

The Reality....



Image Generated by OpenAI

Case Studies

The following case studies are **based on real projects** but have been **anonymized and generalized** for illustration. Any resemblance to actual projects, companies, institutions, or individuals is **purely coincidental**.

These examples highlight **common challenges and best practices** in information management, emphasizing the role of **ISO 19650** in **linking procurement, design, construction, and operations**.

Case Study 1 – BIM Specified, but Without Clarity

Issue:

Client mandated BIM in tender documents, but with no specific information structure.

Impact:

Conflicting interpretations: Some consultants focused on visualization, others on technical data.
No clear information deliverables, leading to lost opportunities.

Lesson:

ISO 19650 defines Exchange Information Requirements (EIR), ensuring clarity on deliverables.
Without structured requirements, BIM adoption is ineffective.

Case Study 2 – Updating Real Estate Records Without a Standard

Issue:

A facilities management team updated building records but lacked an overarching information management plan.

Impact:

Information was collected but not structured for future updates.
The data became obsolete within years, requiring costly rework.

Lesson:

Configuration management is critical—without a structured Asset Information Model (AIM), information decays over time. SANS19650 supports long-term asset data integrity.

Case Study 3 – Smart Building Without Information Requirements

Issue:

No structured information plan at project inception.

Impact:

Drawings, documents, and sensor data were correct but **not linked to operational systems**.
Facilities management had **no structured way to connect** the information to their systems.

Lesson:

Naming conventions, metadata, and asset references **must align from design to operations**.
SANS19650 ensures information requirements are defined early.

Case Study 4 – Smart FM Tech but no Information Strategy

Issue:

A client invested in smart building tech but had no Asset Information Strategy.

Impact:

Multiple database reconfigurations due to misaligned datasets.

No clear information ownership—data was fragmented across teams.

Lesson:

SANS19650 emphasizes structured information delivery from all project phases.

Technology must serve a defined information framework—not the other way around.

Case Study 5 – Smart Building with a Vision

What worked:

The client defined information requirements at the start (OIR, AIR, EIR).
Naming conventions, metadata, and tagging were aligned across all contributors.
All project data was structured for easy transition into the CAFM system.

Outcome:

A functional first-generation digital twin with live IoT data integration.
Efficient handover to operations, reducing post-construction setup time.

Lesson:

SANS19650 provides structured workflows that enable digital transformation.

Case Study 6 – Simple but Effective Information Management

What worked:

Small-scale client prioritized structured information, not technology.
Used spreadsheets, structured file management, and naming conventions.
Integrated information management into their ISO 9001 certification.

Outcome:

A simple but highly effective facilities management system.
Minimal effort required to keep data updated and usable.

Lesson:

SANS19650 is scalable—good information management doesn't always require an expensive, sophisticated solution. Even a well-structured spreadsheet can outperform unstructured digital data.

The Link Between Procurement, Design, Construction & Operations

The core message of SANS 19650 is beginning with the end in mind.

Structured information enables:

- Procurement: Defined information deliverables in contracts.
- Design: Alignment with asset management needs.
- Construction: Handover-ready information.
- Operations: Seamless integration into facilities management.

Group Questions

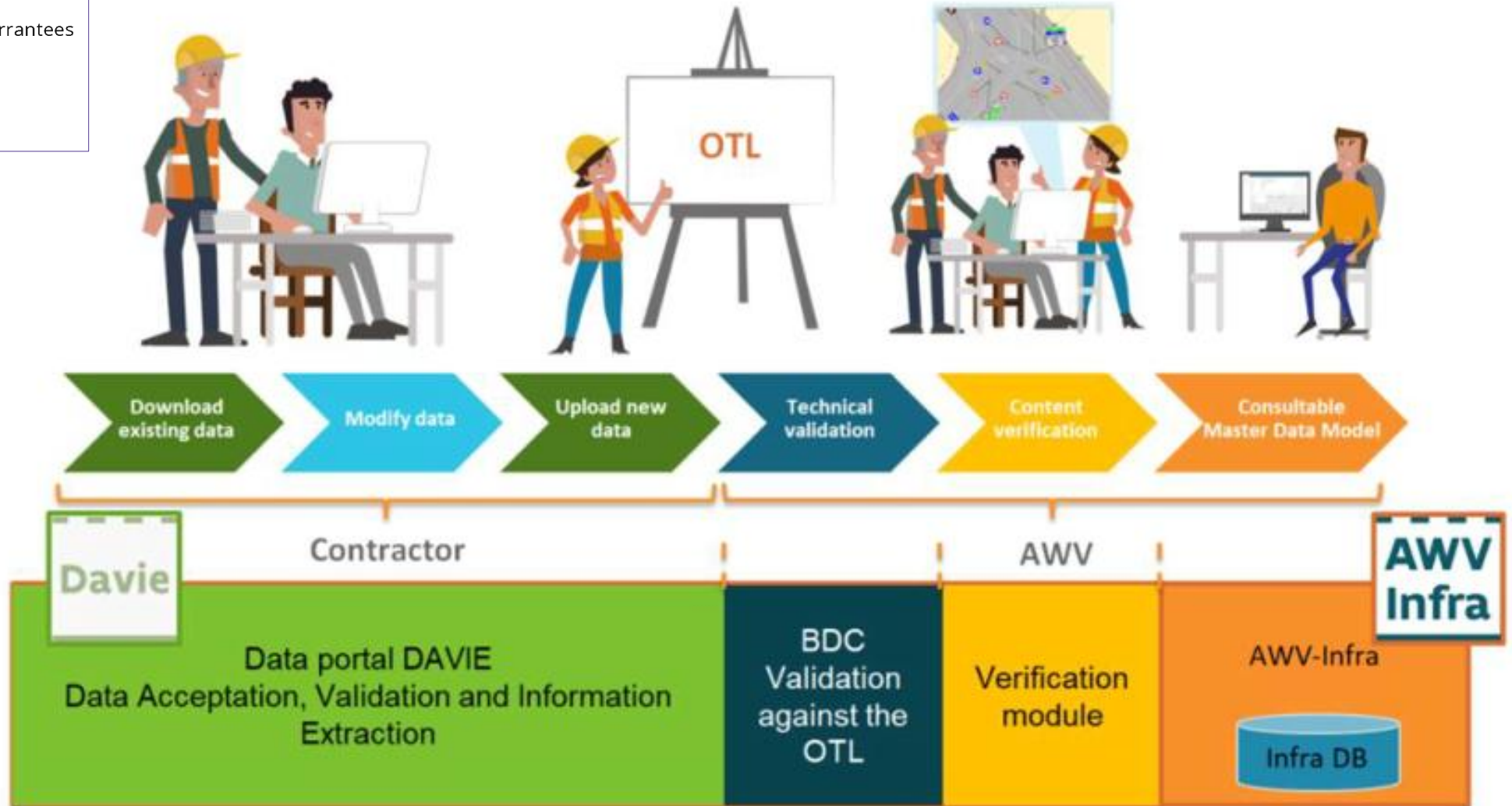
1. For your group, what are the top 3 Information requirements that the organisation has?
→ I need [info] in this [format] in order to [business purpose]
2. What asset information would support this requirement?
→ I need information about [asset] in order to [outcome]
3. Describe the BIM in terms of
→ Baby [bare minimum, starting point],
→ Papa [ultimate “BIM state”]
→ and Mama [happy medium]

REMEMBER: BIM = Better Information Management

What did the Road Authority of Flanders do?

Example : Flemish Agency for Roads and Traffic

-  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





Example : Flemish Agency for Roads and Traffic

**BIM Policy – formalised approach to BIM
Information Standards**

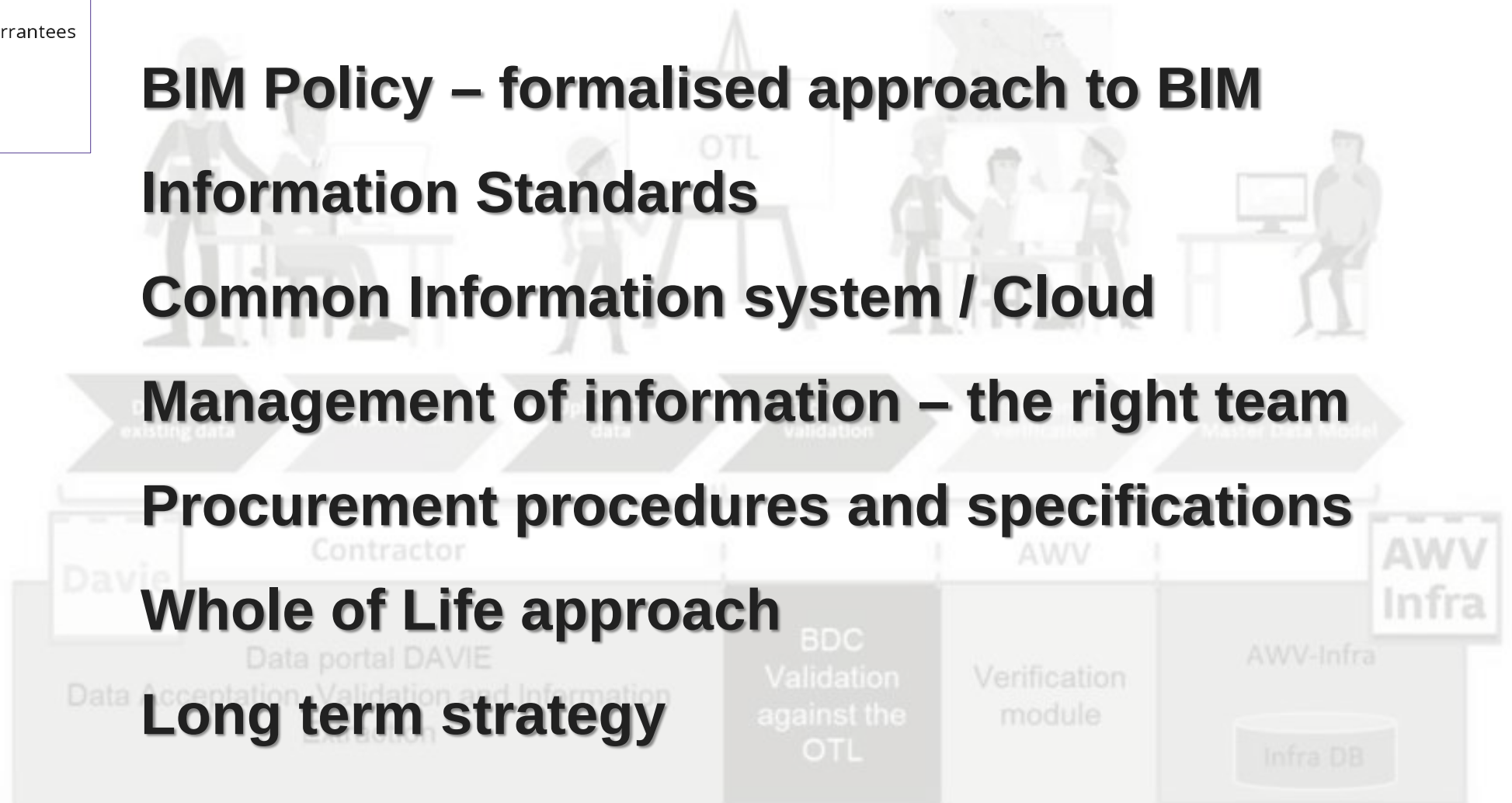
Common Information system / Cloud

Management of information – the right team

Procurement procedures and specifications

Whole of Life approach

Long term strategy



And Closer to Home...



Imagine if...

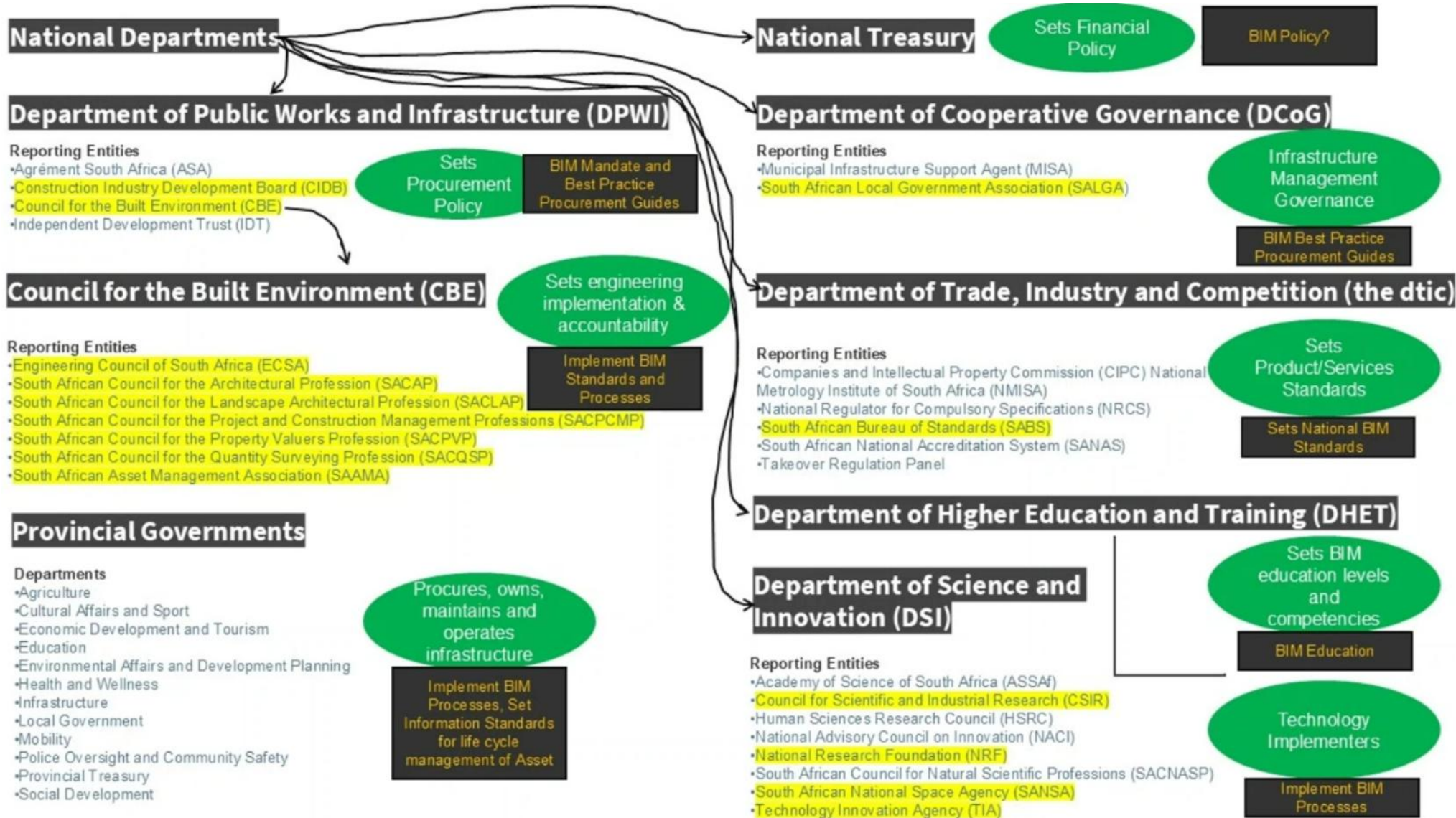
- Information was created with operations in mind.
- Asset Owners had all the information about their assets, from the start of operations.
- Good quality information was available to implement AI for business improvement.
- Decisions were based on good data and insights, rather than “Gut Feel”.
- Projects delivered good information consistently as a matter of course.

A few things would need to change...

Getting this done...



Navigating the complexities of the Industry



We're driving change in (South) Africa,
Will you join us?

In summary

The SANS 19650 process and its role in bridging between design, construction and operation in the Built Environment(s).

Construction produces built assets

- ➡ Built assets must deliver value for a long time...
- ➡ to facilitate sustained value, Asset Managers/FMs require good info!
- ➡ good information is enabled by BIM, according to SANS 19650

The right *people*, following agreed *processes and requirements*

... will deliver both the built assets and the good information.