BIM Harambee .Africa

26 July 2024: Session 1

The BIM Organization

Implementation to Project-Readiness

Speaker: Richard Matchett
Digital Lead, Zutari, South Africa


"CLEARLY, THE THING
THAT'S TRANSFORMING IS
NOT THE TECHNOLOGY —
IT'S THE TECHNOLOGY THAT
IS TRANSFORMING YOU."
- JEANNE W. ROSS OF MIT SLOAN'S CENTER
FOR INFORMATION SYSTEMS RESEARCH -

Pre-1990's – Math, science and drawings

1990’s - 2008’ish… CAD – automation of the drawing board

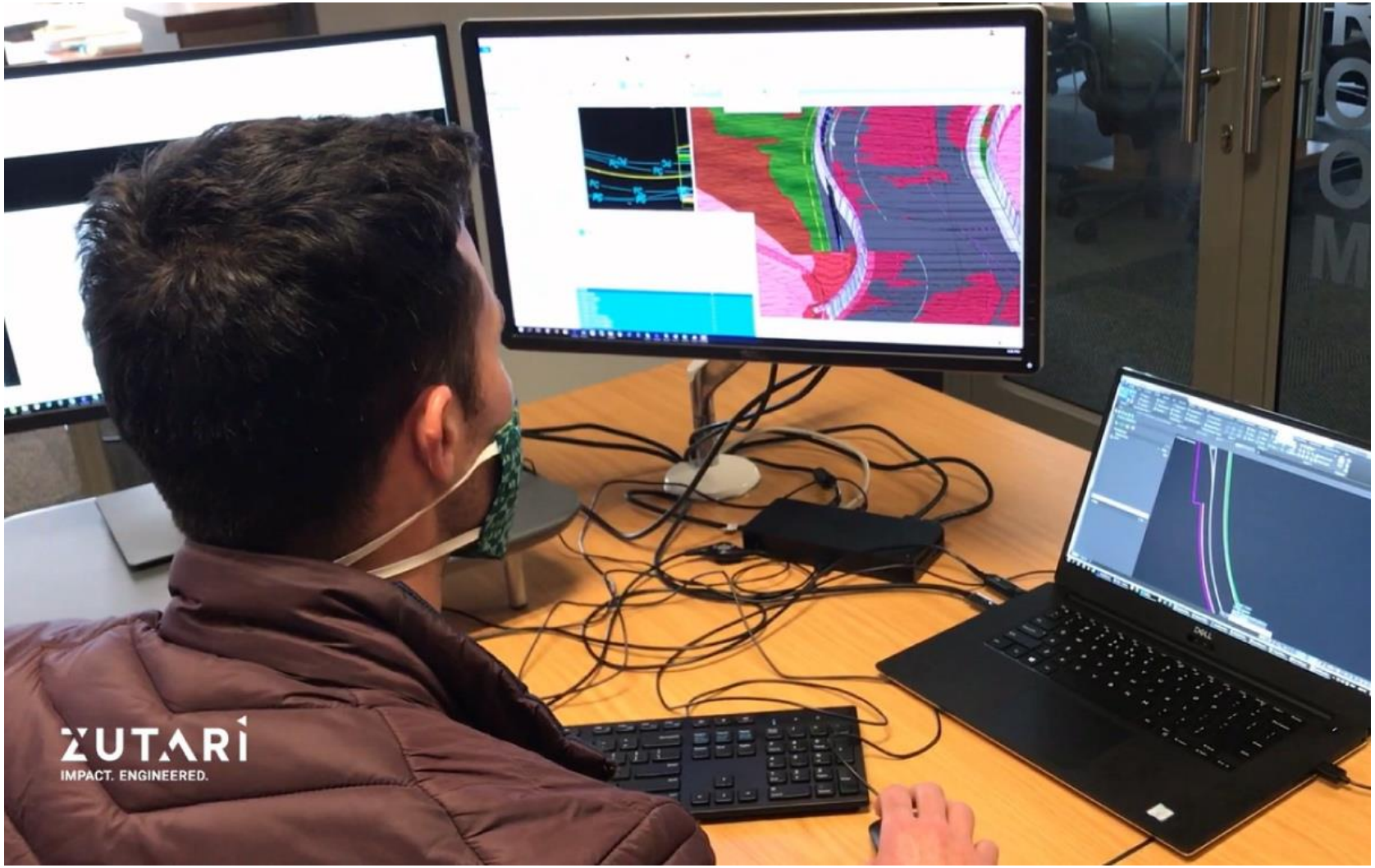
Essentially the same thing, just not on paper with pens, rulers and stencils!

Computers made drafting and tracing easier and more efficient, but didn’t change the basic principle of creating ***DRAWINGS***

Now – where industry is moving: Digital Project Delivery

The proactive adoption of emerging technologies, and the development of our people to use these technologies effectively and reliably.

Beyond drawings, into the future of data driven operations



Raising the BIM tide

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WISDOM

KNOWLEDGE

INFO

DATA

Know-how, experience, insight, understanding and contextualised knowledge

Contextualised, categorised, calculated and condensed data

Facts and figures which relay something specific, but which are not organised

~~WISDOM~~ *Intelligence/Smartness*

Derive & Attain

KNOWLEDGE

Interpret

INFO

Process / synthesise

DATA

Collect

***Optimise** performance*

What information do we need for decisions?
How can I optimise my operations?
What if…? How could we…? Should we…?

***Provide** value*

What do you know? How do you collaborate?
Sharing ideas, collaborating, avoidance of doubt.
How is your facility performing?

***Create** information*

Analyze the data, create meaning, produce new information, design.
What facility assets do you have? What does it consist of?
What condition is it?

***Measure** the physical world*

What is there?

Raising the BIM tide

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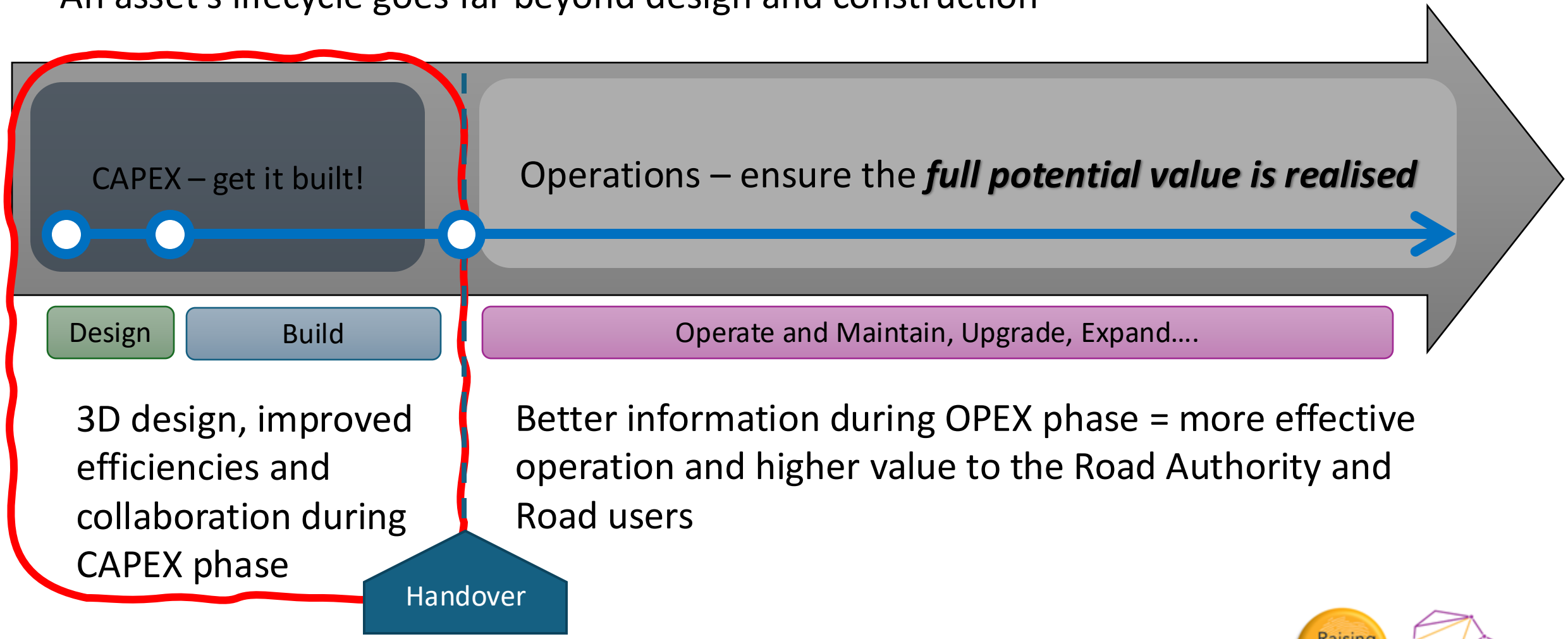
Whole of Life Value – Better Information Management

An asset's lifecycle goes far beyond design and construction



Whole of Life Value – Better Information Management

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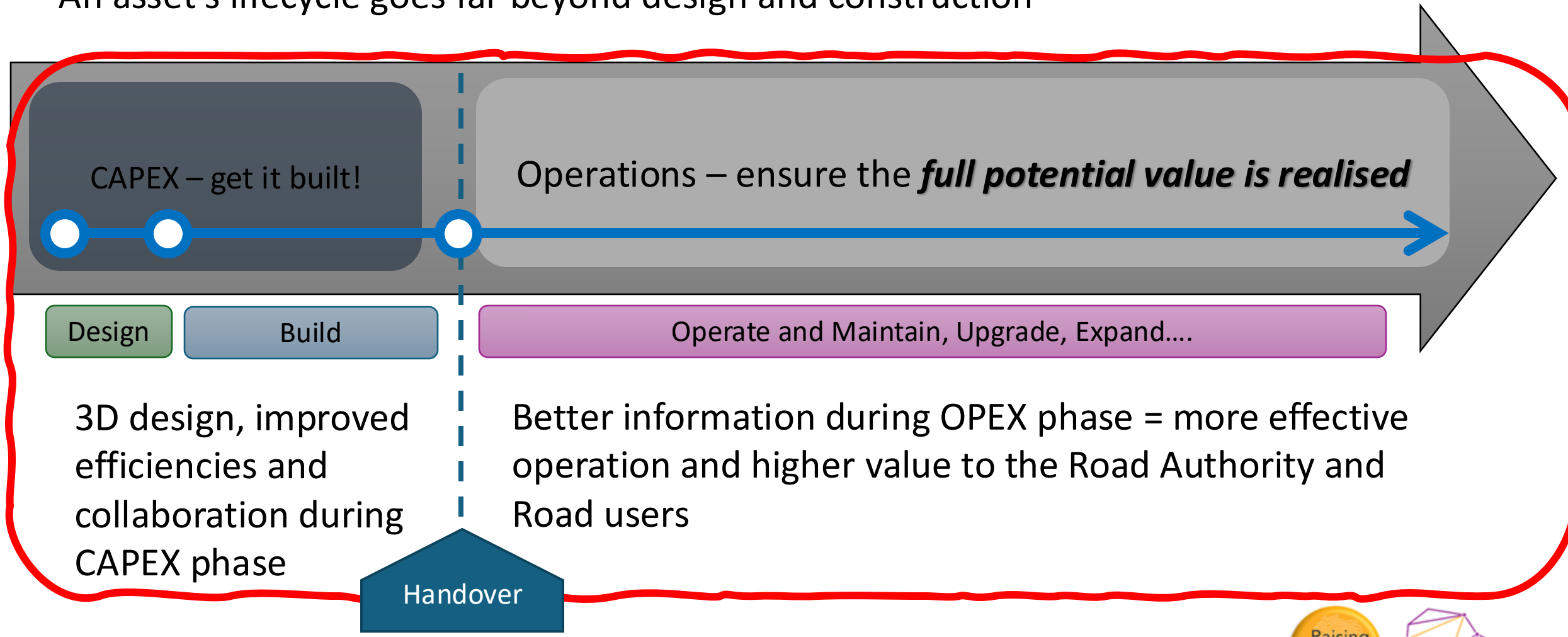
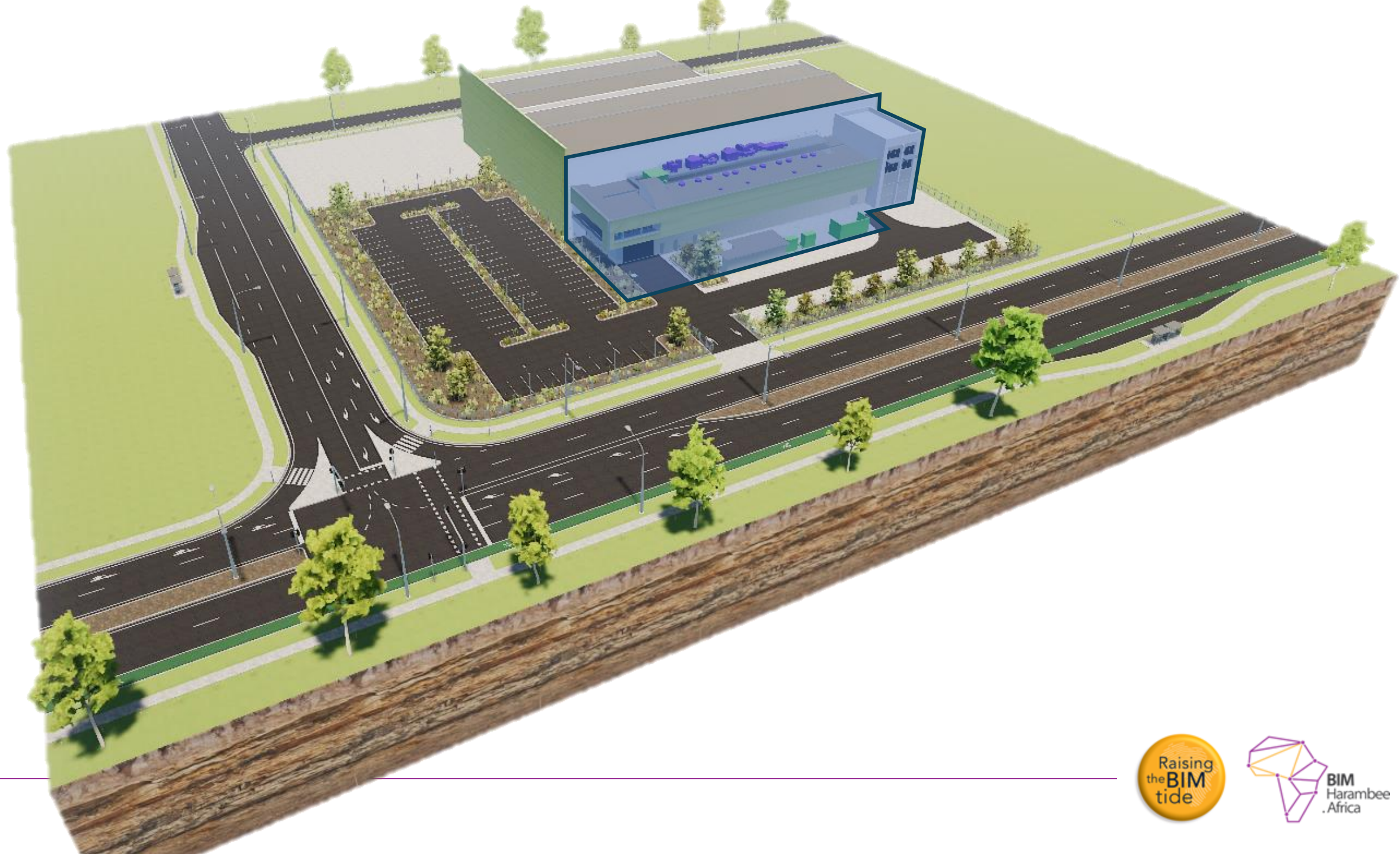


Design Approach

Better Information Management



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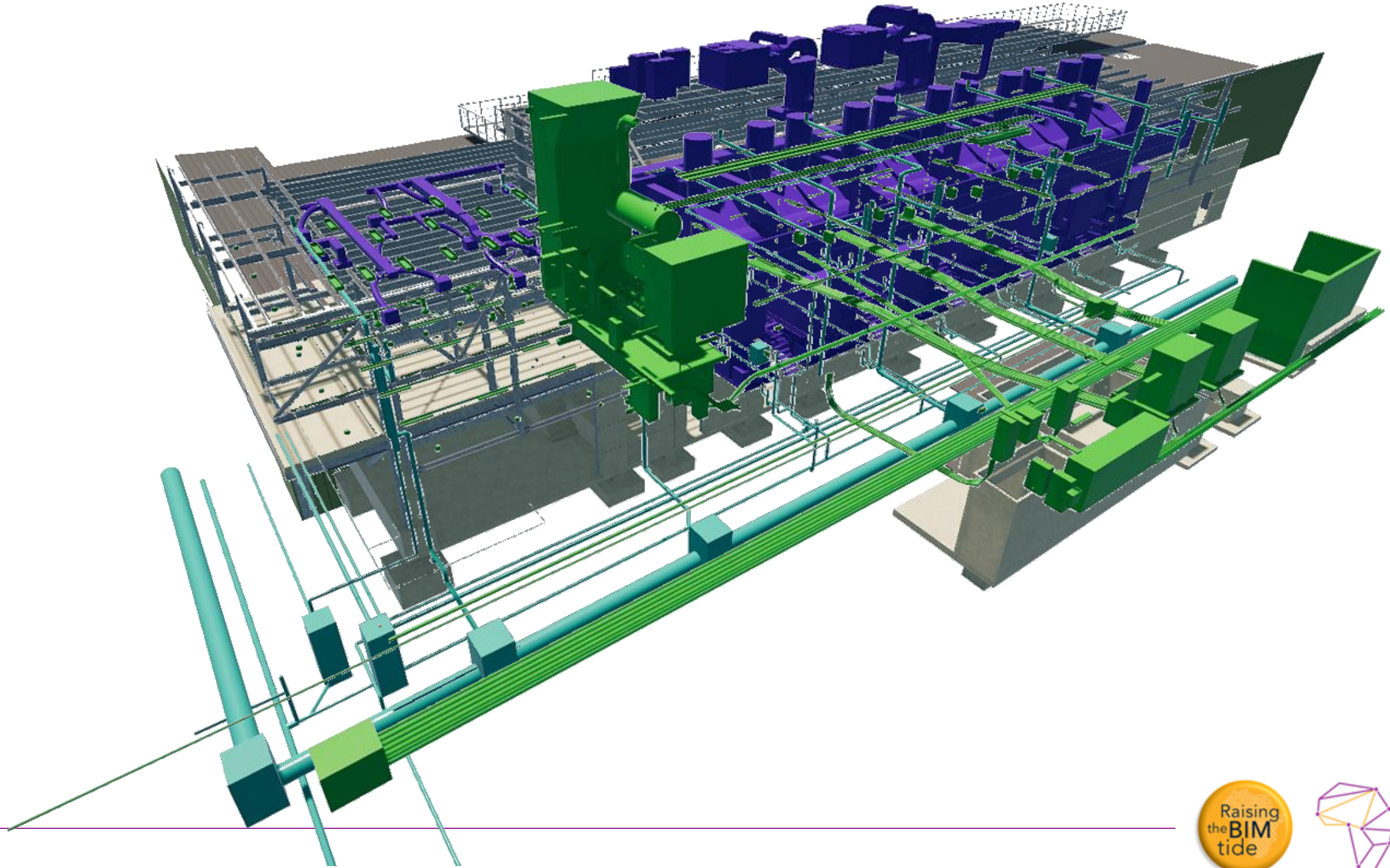

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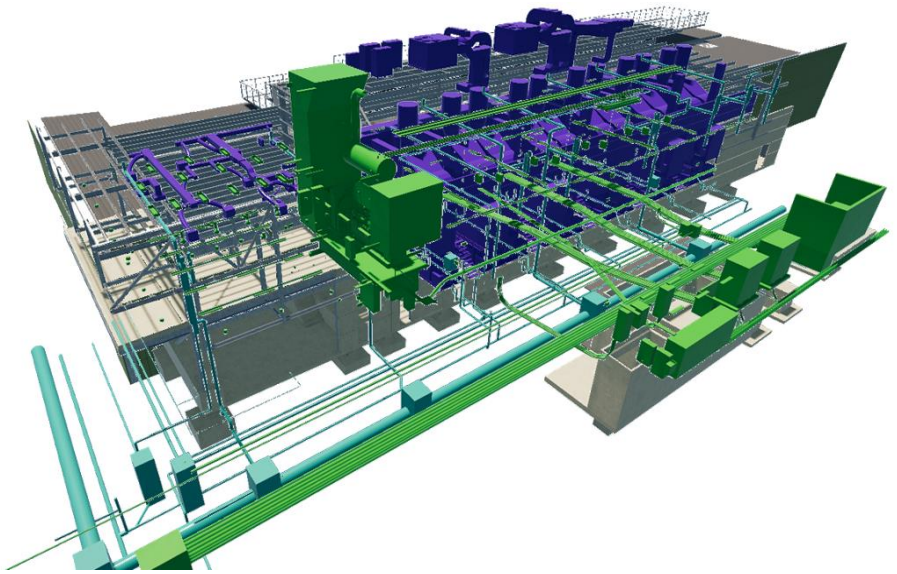
Category Name = Mechanical Equipment
Family Name = Aur_A_AHU_Packaged Ventilator Type 2
Type Name = Standard
System Classification = Exhaust Air,Supply Air,Return Air
System Name = Mechanical Exhaust Air 288,Mechanical Supply Air 437,Mechanical Return Air 349
Phase Created = New Construction
OmniClass 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 familiar reality ….

- 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



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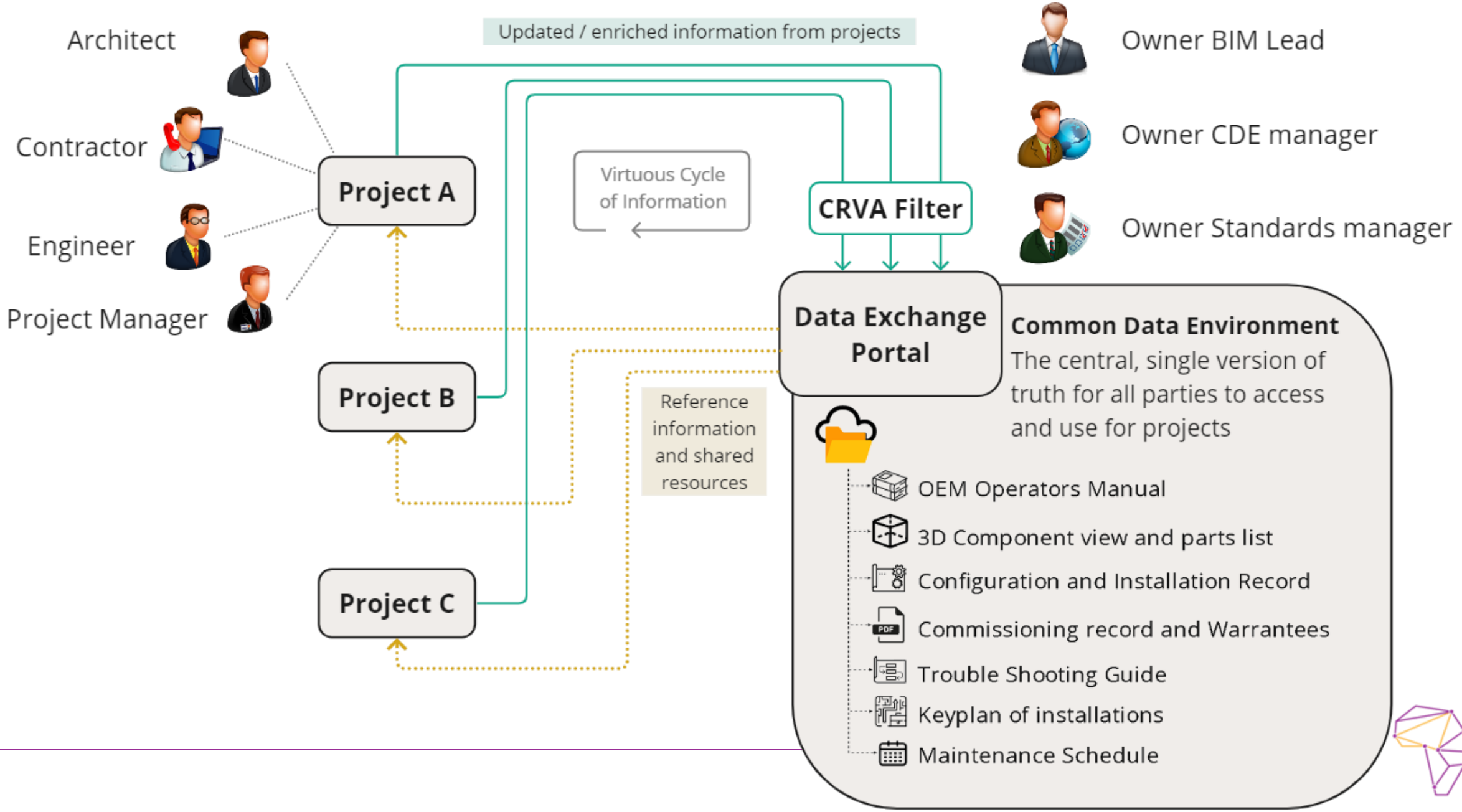
Asset Information Management



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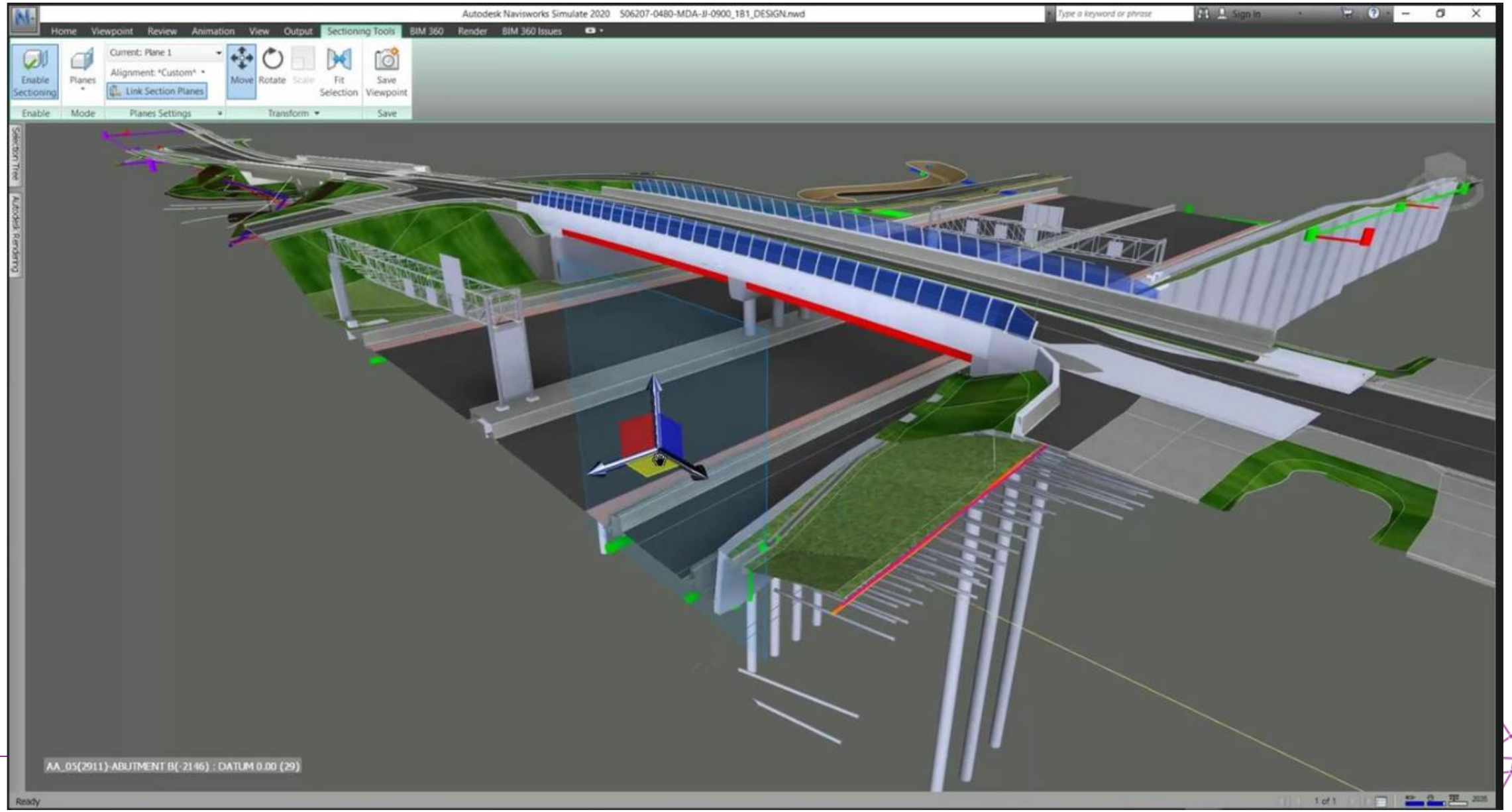
Not just buildings!!!



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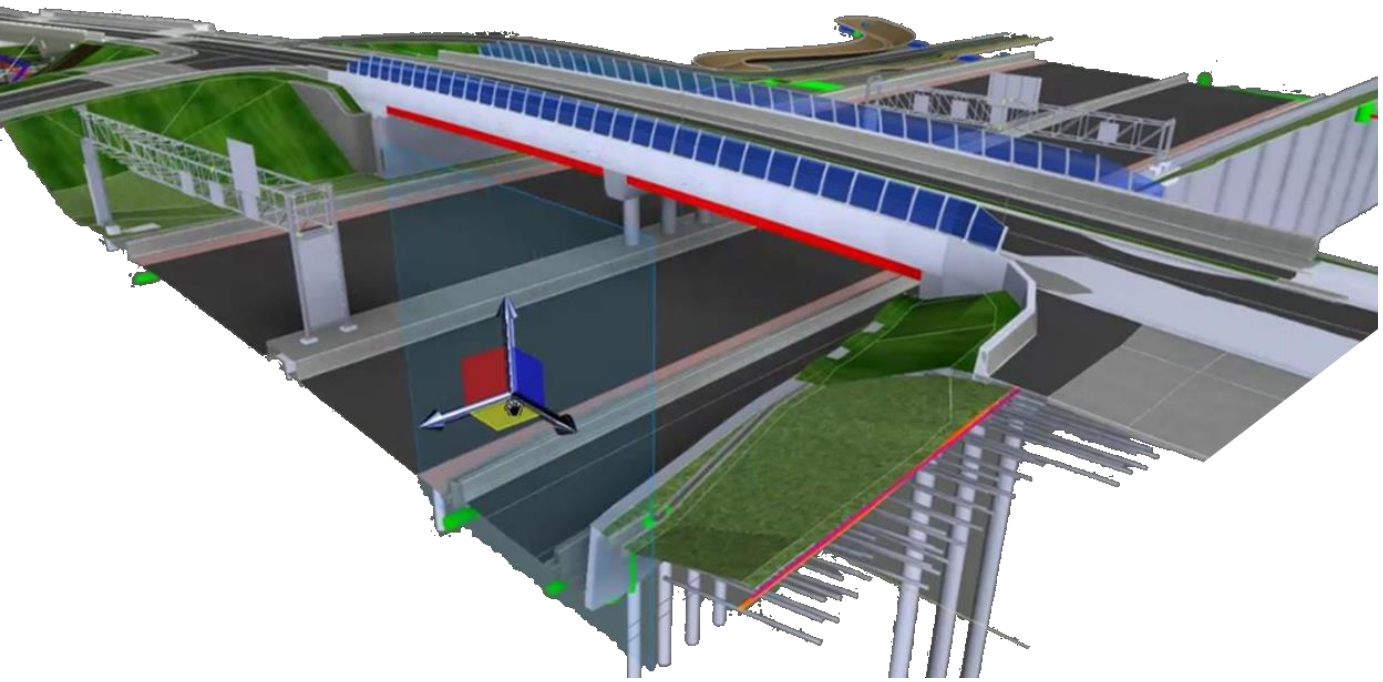
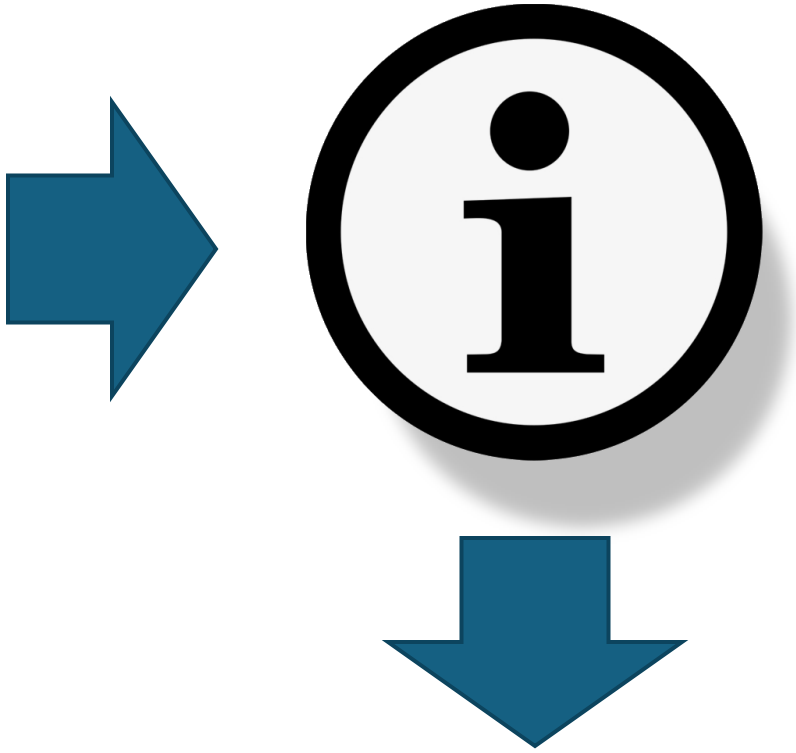
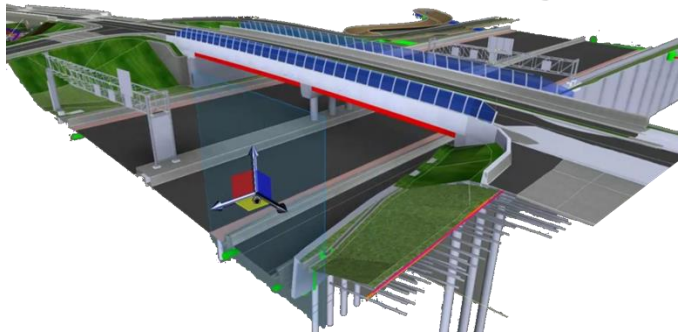
All design info is potential asset info



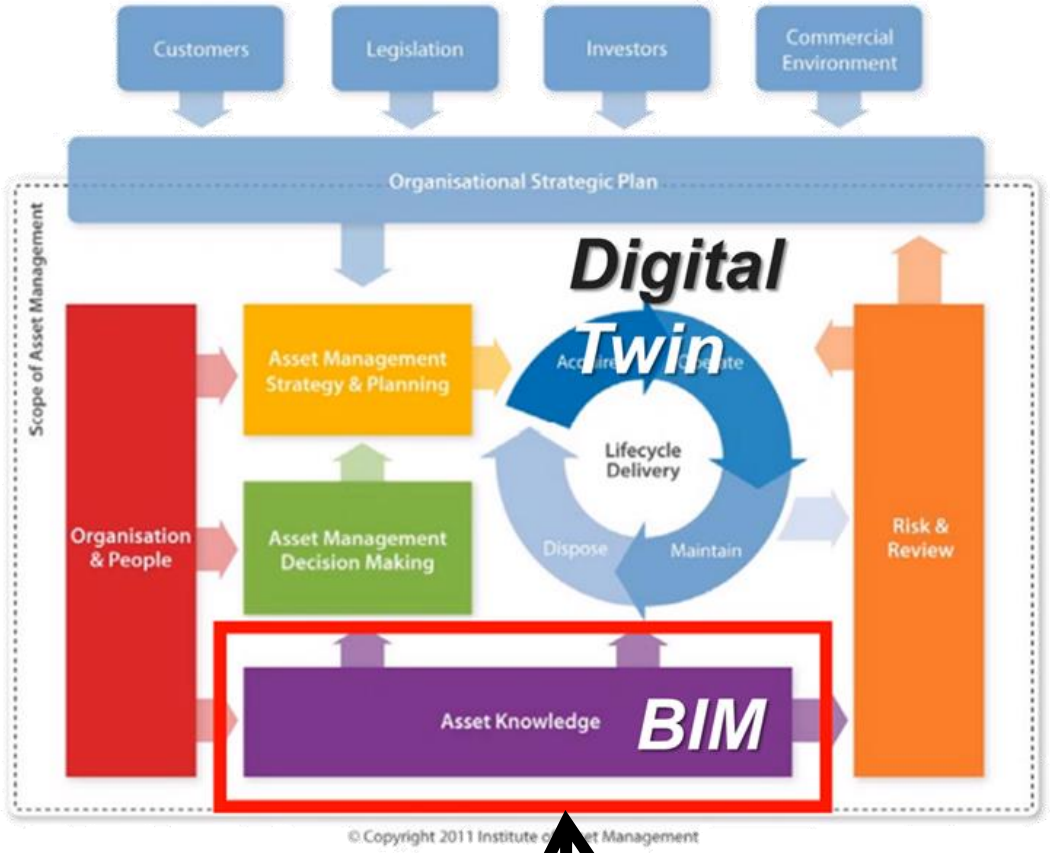


Asset Information

Good Asset Management depends on good BIM



Asset Information



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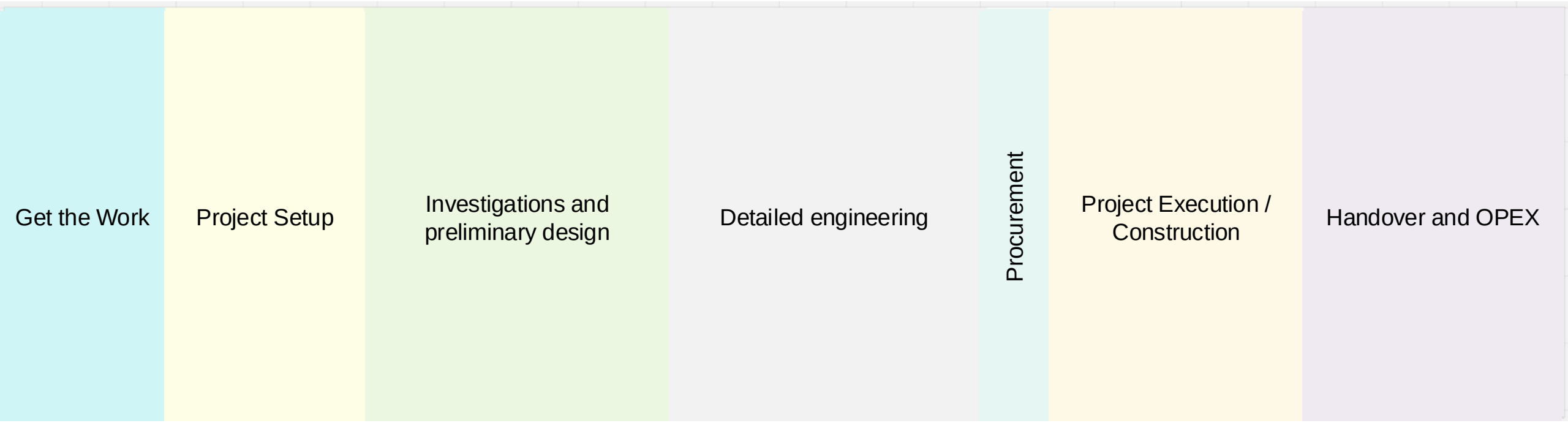
So what does this look like on a project?

Start by understanding your processes



Compete for- and win work

Information systems and Project setup

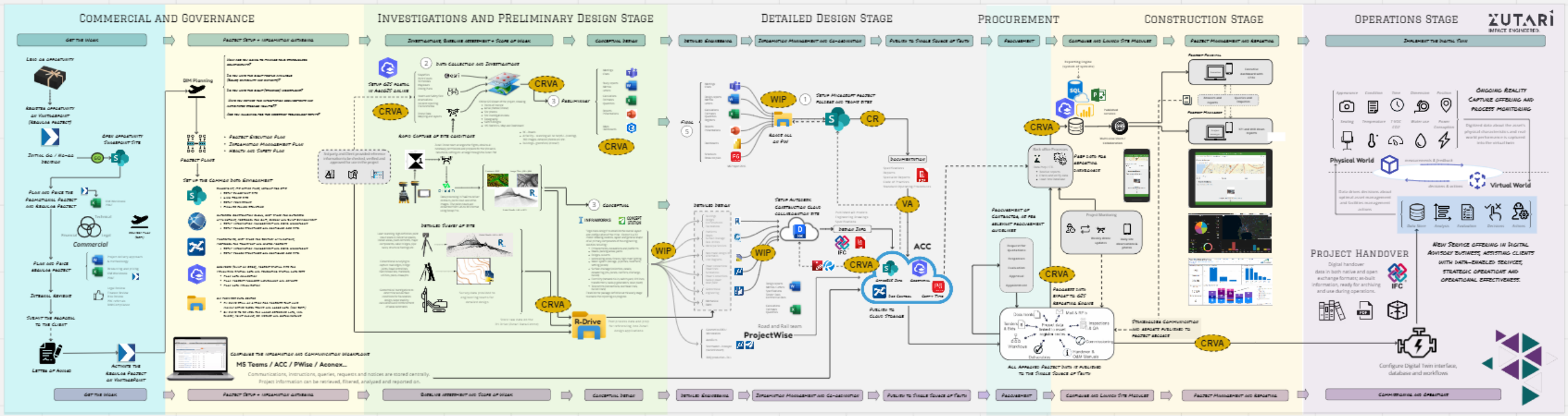
Reality Capture and Concept designs

Detailed design and production of Information

Procurement

Monitor, Report, Capture and Record

Digital Twins



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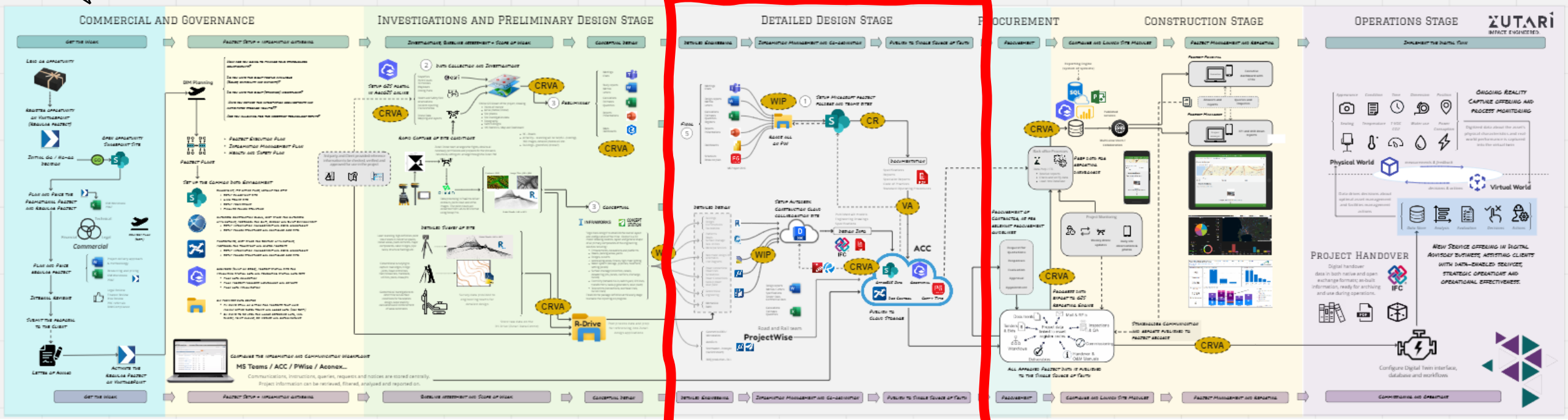


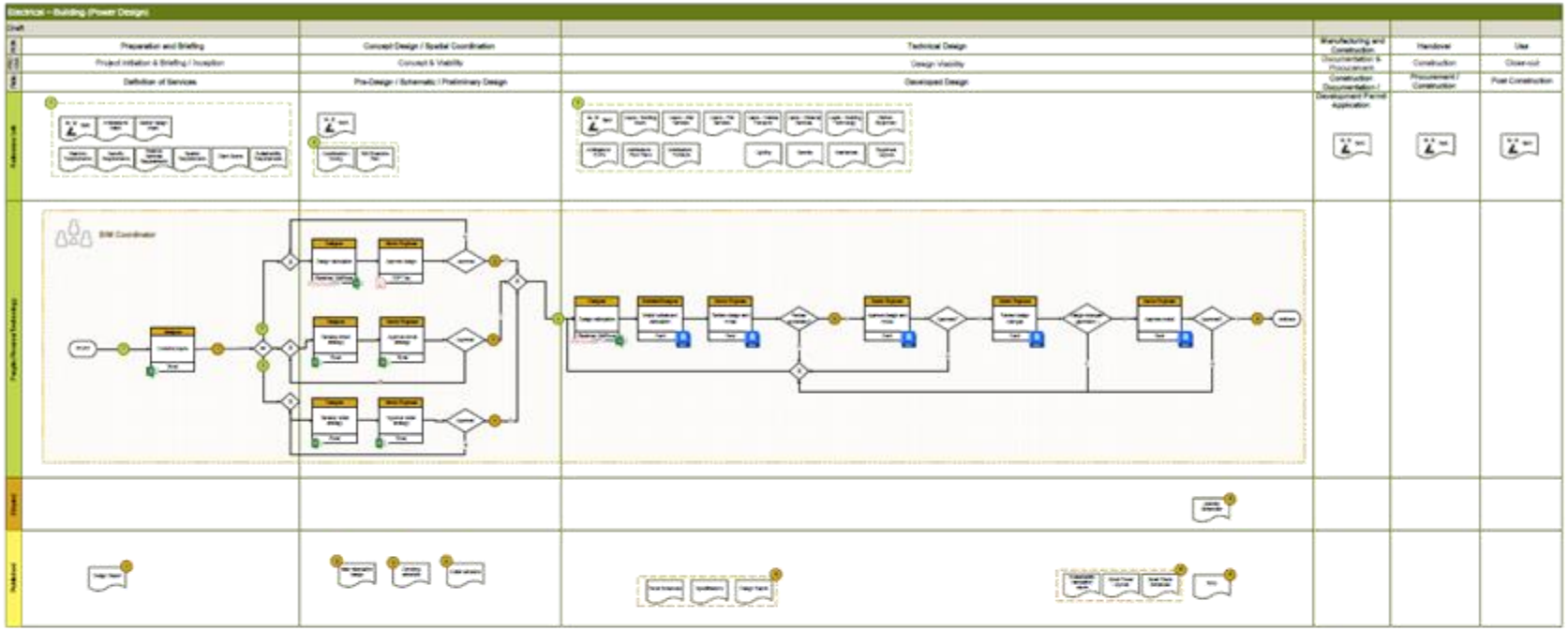
… and starts here

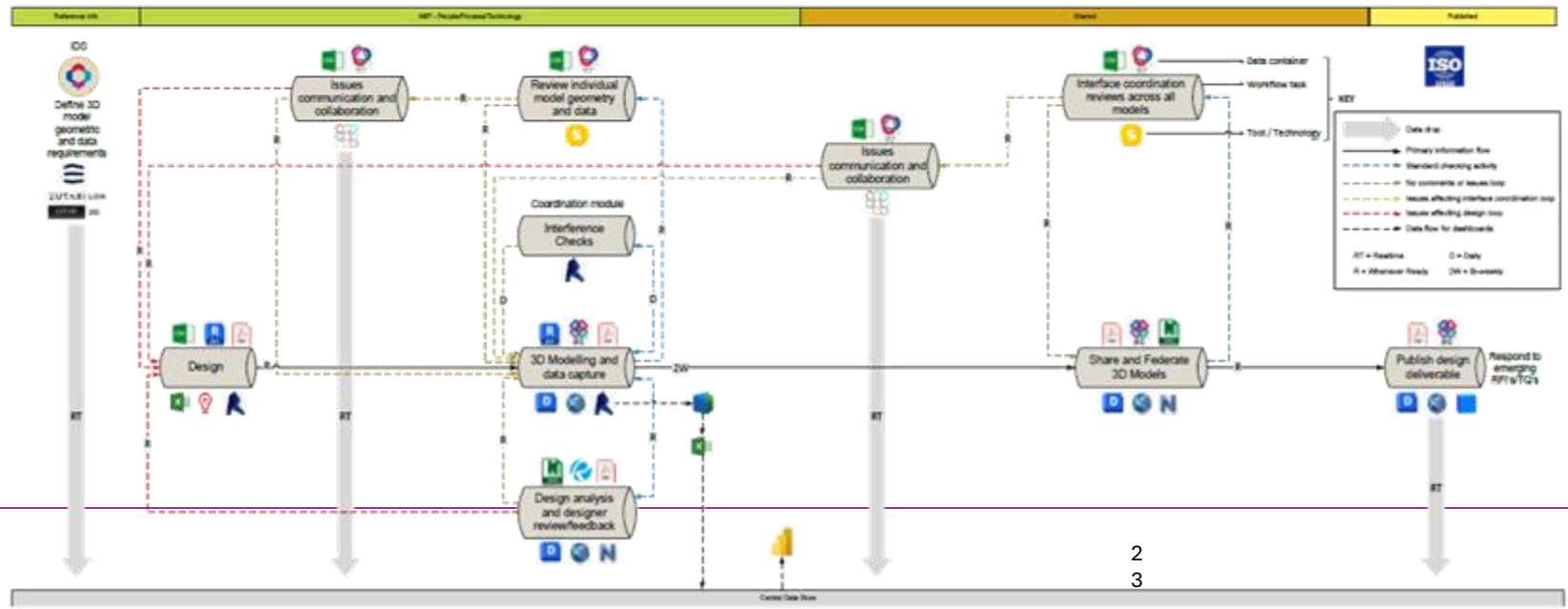
… and here

BIM is here

… and here

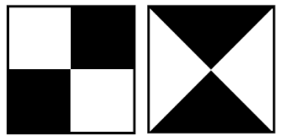
… and here





Process & Technology









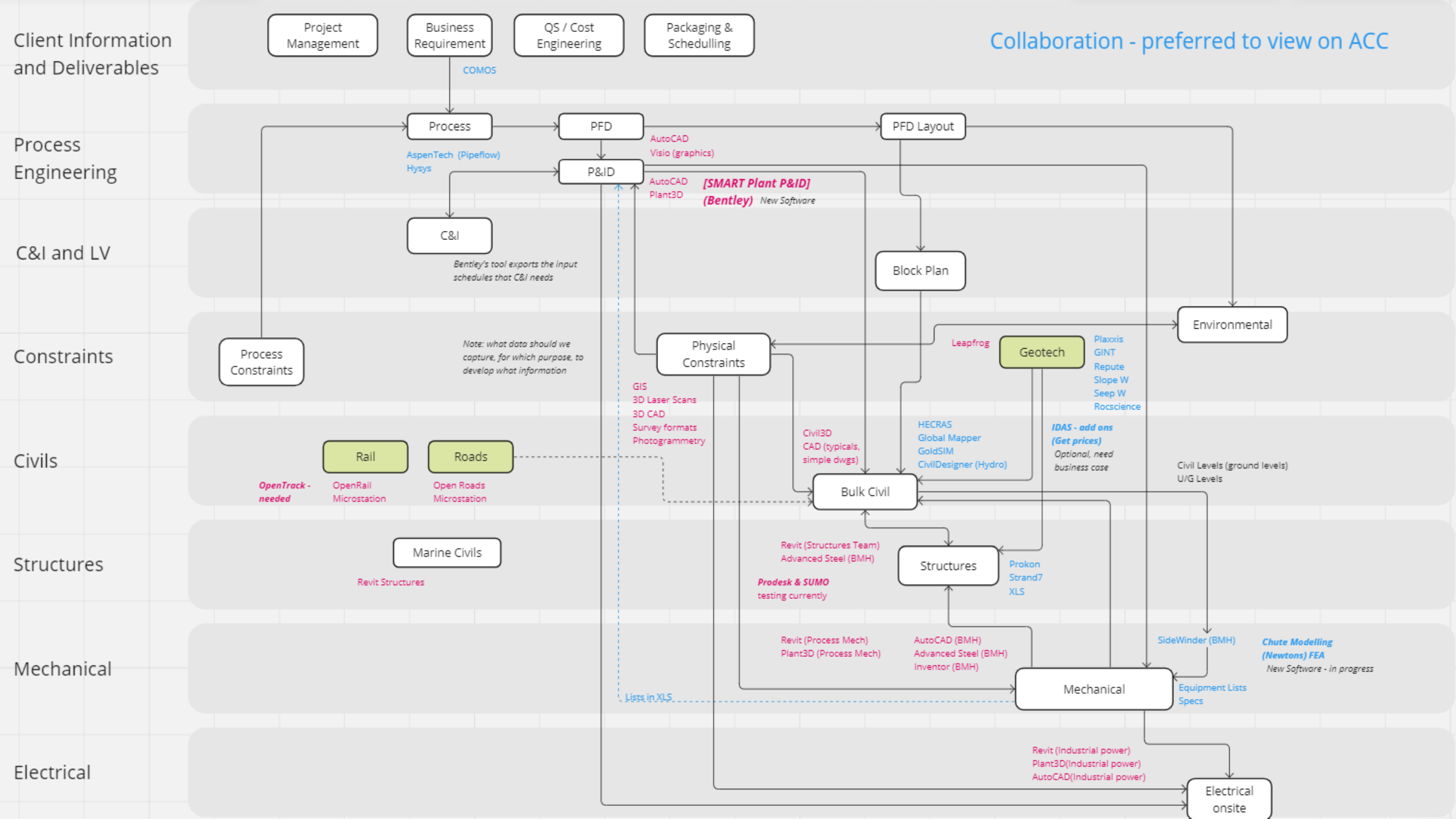
HOLO
BUILDER
A FARO® Technologies Company

ENSCAPE™

Cyclone
REGISTER 360 (BLK Edition)

3DR


Raising
the BIM
tide
BIM
Harambee
Africa


Client Information and Deliverables
Process Engineering
C&I and LV
Constraints
Civils
Structures
Mechanical
Electrical
Collaboration - preferred to view on ACC
Project Management
Business Requirement
QS / Cost Engineering
Packaging & Schedulling
COMOS
Process
PFD
PFD Layout
AutoCAD
Visio (graphics)
AspenTech (Pipeflow)
Hysys
P&ID
AutoCAD
Plant3D
[SMART Plant P&ID]
(Bentley)
New Software
C&I
Bentley's tool exports the input schedules that C&I needs
Block Plan
Environmental
Process Constraints
Note: what data should we capture, for which purpose, to develop what information
Physical Constraints
Leapfrog
Geotech
Plaxxis
GINT
Repute
Slope W
Seep W
Rocscience
GIS
3D Laser Scans
3D CAD
Survey formats
Photogrammetry
Civil3D
CAD (typicals, simple dwgs)
HECRAS
Global Mapper
GoldSIM
CivilDesigner (Hydro)
IDAS - add ons
(Get prices)
Optional, need business case
Civil Levels (ground levels)
U/G Levels
Rail
Roads
OpenTrack - needed
OpenRail
Microstation
Open Roads
Microstation
Bulk Civil
Marine Civils
Revit Structures
Revit (Structures Team)
Advanced Steel (BMH)
Prodesk & SUMO
testing currently
Structures
Prokon
Strand7
XLS
Revit (Process Mech)
Plant3D (Process Mech)
AutoCAD (BMH)
Advanced Steel (BMH)
Inventor (BMH)
SideWinder (BMH)
Chute Modelling
(Newtons) FEA
New Software - in progress
Lists in XLS
Mechanical
Equipment Lists
Specs
Revit (Industrial power)
Plant3D(Industrial power)
AutoCAD(Industrial power)
Electrical onsite

Project Manager

I make sure it gets done…. Right.

Risk

Execute

Monitor

Integrate

Schedule

Plan

Control

Scope

Comms

Initiate

Procure

Quality

Cost

Stakeholder

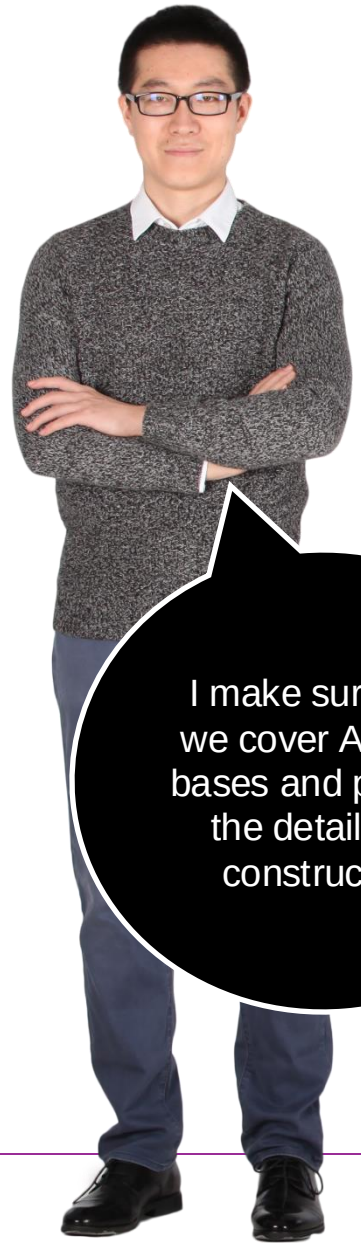
The Engineers

We make the future infrastructure dreams of the world come true

We use modelling, math and science to design awesome projects

We are responsible for shaping the world that we and our children will thrive in

BIM Detailer



I make sure that we cover ALL the bases and provide the details for construction

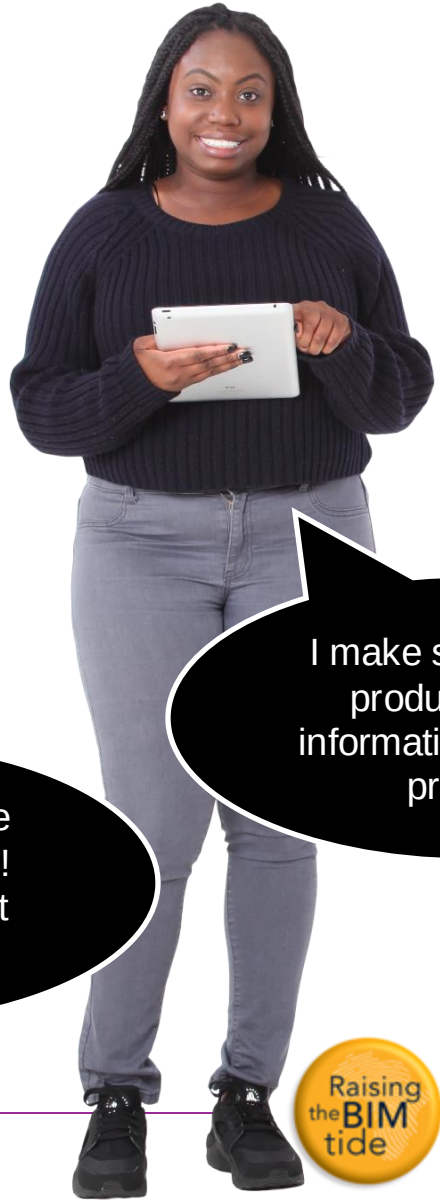
BIM Modeller

My models help us see the end product before we start building

BIM Coordinator

Coordination is the name of the game! Everything must fit together

Information Manager



I make sure that we produce useful information on all our projects

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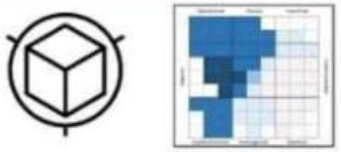
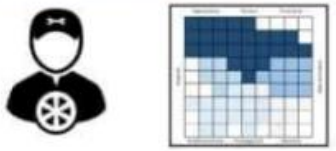
BIM Detailer



Role that generates, parameterizes and extracts information and geometry from a model using data mining, analysis and authoring tools. It has functional, technical and support skills.

BIM Modeller

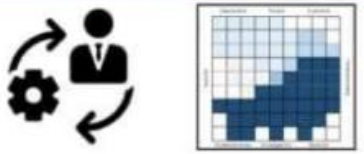


Role that designs, calculates and manages Information using modeling tools. Experience in an area of knowledge and administrative, functional, technical and operational skills.

BIM Coordinator

Role that knows and manages systems, processes, technical framework and BIM project management. It has functional, administrative and managerial skills. Knowledge of information coordination, management and interoperability.

BIM Manager



Role in charge of organizational and project strategy, has managerial, administrative, and implementation skills. Defines systems, processes, technical BIM framework and project management strategy.

BIM CONSULTANT

Centralised role supporting the overall Zutari BIM strategy, supports the Digital Lead and BIM Lead, capacitating BIM Managers, mentoring BIM coordinators and providing R&D support in markets alongside Market BIM Managers.

- Information Production*
- Advance Modeling*
- BIM Content Development and Management*
- Quality Control
- Production Process*
- BIM Interoperability
- Data and Information Management
- Management (Operation)
- Project Management
- BIM Systems management
- Technical and collaborative framework
- Quality Assurance
- Management (Strategy)
- Research and Development
- Implementation
- 3D, 4D, 5D, 6D Operations
- Collaborative Process
- Basic Modeling
- Field Experience

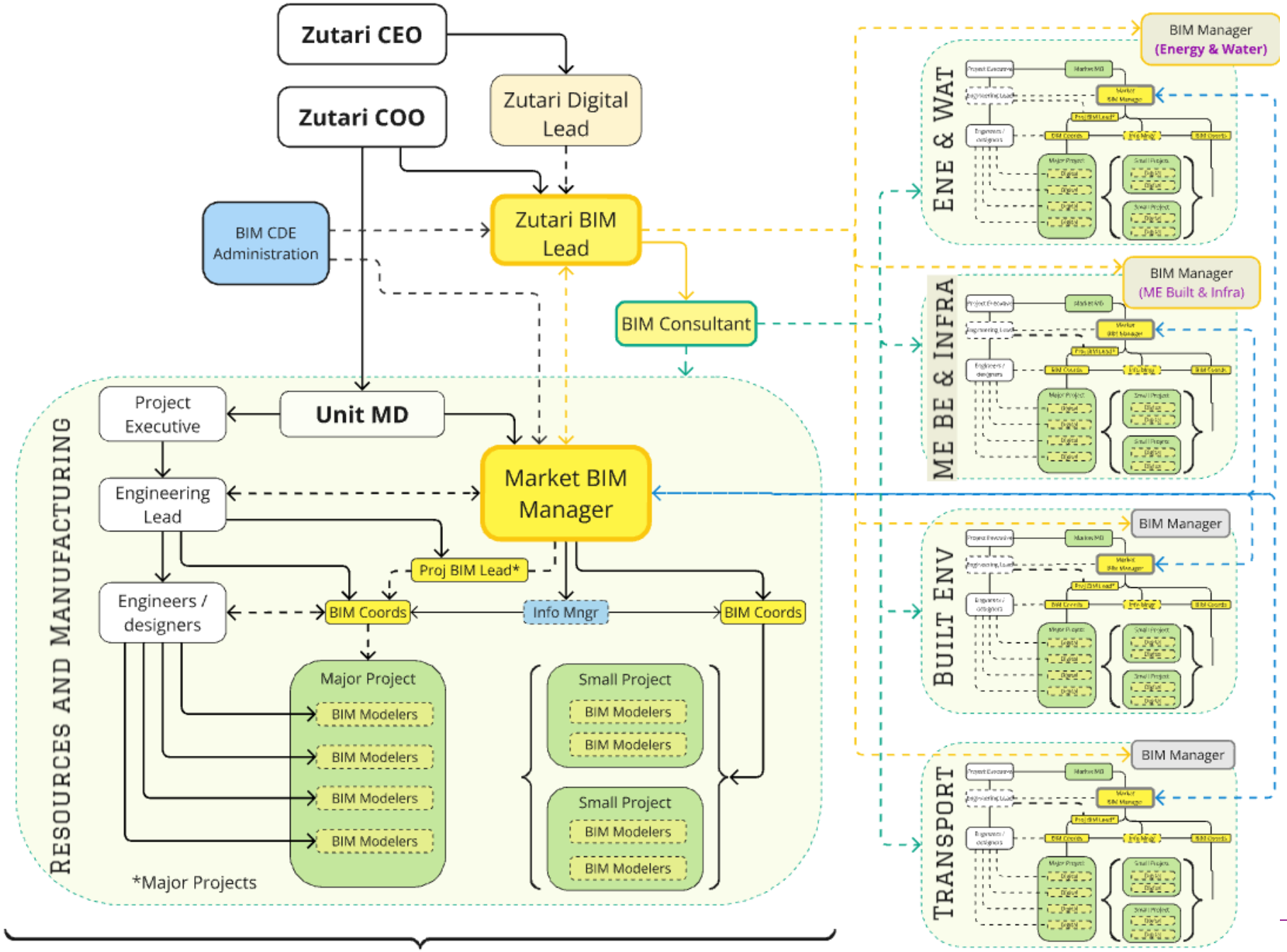
Technology ⟷ Knowledge ⟷ Experience

* Related to each specific BIM use or support role

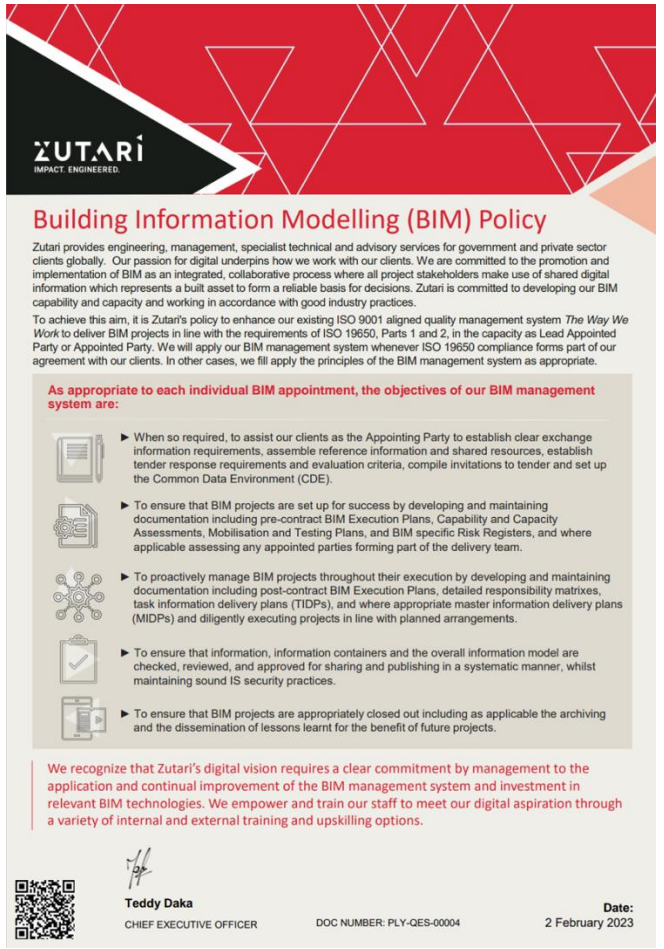
Adapted from TDC | LAB

ZUTARI
IMPACT. ENGINEERED.

Top Down



Generic market structure for BIM Implementation



ZUTARI
IMPACT. ENGINEERED.

Building Information Modelling (BIM) Policy

Zutari provides engineering, management, specialist technical and advisory services for government and private sector clients globally. Our passion for digital underpins how we work with our clients. We are committed to the promotion and implementation of BIM as an integrated, collaborative process where all project stakeholders make use of shared digital information which represents a built asset to form a reliable basis for decisions. Zutari is committed to developing our BIM capability and capacity and working in accordance with good industry practices.

To achieve this aim, it is Zutari's policy to enhance our existing ISO 9001 aligned quality management system *The Way We Work* to deliver BIM projects in line with the requirements of ISO 19650, Parts 1 and 2, in the capacity as Lead Appointed Party or Appointed Party. We will apply our BIM management system whenever ISO 19650 compliance forms part of our agreement with our clients. In other cases, we fill apply the principles of the BIM management system as appropriate.

As appropriate to each individual BIM appointment, the objectives of our BIM management system are:

- When so required, to assist our clients as the Appointing Party to establish clear exchange information requirements, assemble reference information and shared resources, establish tender response requirements and evaluation criteria, compile invitations to tender and set up the Common Data Environment (CDE).
- To ensure that BIM projects are set up for success by developing and maintaining documentation including pre-contract BIM Execution Plans, Capability and Capacity Assessments, Mobilisation and Testing Plans, and BIM specific Risk Registers, and where applicable assessing any appointed parties forming part of the delivery team.
- To proactively manage BIM projects throughout their execution by developing and maintaining documentation including post-contract BIM Execution Plans, detailed responsibility matrixes, task information delivery plans (TIDPs), and where appropriate master information delivery plans (MIDPs) and diligently executing projects in line with planned arrangements.
- To ensure that information, information containers and the overall information model are checked, reviewed, and approved for sharing and publishing in a systematic manner, whilst maintaining sound IS security practices.
- To ensure that BIM projects are appropriately closed out including as applicable the archiving and the dissemination of lessons learnt for the benefit of future projects.

We recognize that Zutari's digital vision requires a clear commitment by management to the application and continual improvement of the BIM management system and investment in relevant BIM technologies. We empower and train our staff to meet our digital aspiration through a variety of internal and external training and upskilling options.

Teddy Daka
CHIEF EXECUTIVE OFFICER

DOC NUMBER: PLY-QES-00004

Date:
2 February 2023

Raising the BIM tide

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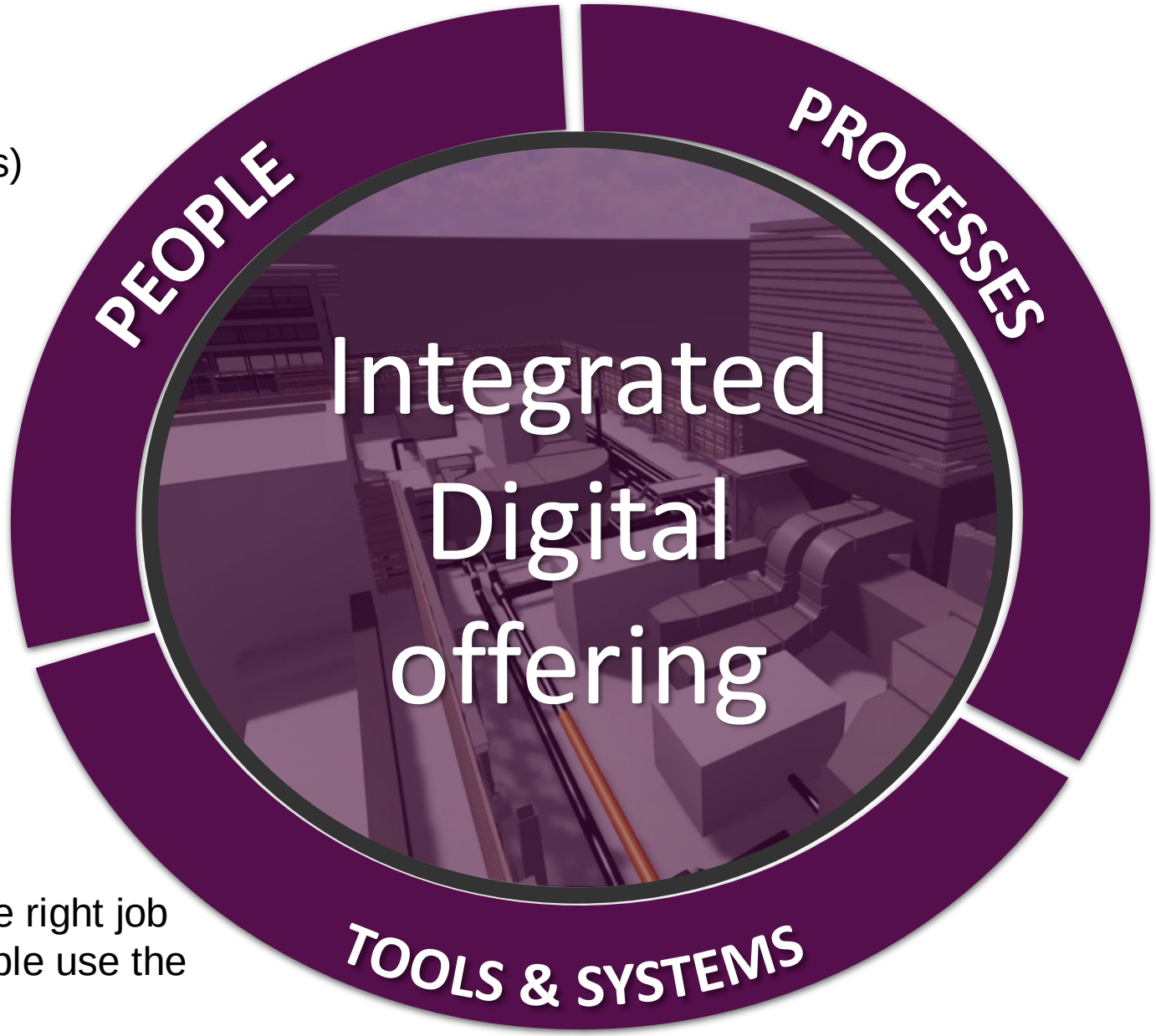
- ✓ Right roles,
- ✓ Sufficient capacity (plan your resources)
- ✓ Relevant skills
- ✓ Right Culture
- ✓ Great Attitude



- ✓ Overall Game Plan
- ✓ Detailed workflows
- ✓ Information patterns
- ✓ Delivery plans
- ✓ Comms Plans
- ✓ Quality Strategy

- ✓ The right tools for the right job
- ✓ Make sure your people use the tools properly!

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Math, Science and Design are not essentially different

but…

The “why” and the “way” we deliver projects, is.