



# Using **BIM / Digital Engineering** to de-risk and improve the entire **Project Lifecycle Management**





## Holger de Groot

National Director of BIM, MArch, PGDipArch

As National Director of BIM for the Australian region, my role is to **Supervise and Guide** Digital Practice Leaders at HDR. I am responsible for **Implementing** and advising leadership on the corporate Digital Practice **BIM Strategy**, interacting with **Various Disciplines** and advising on BIM matters at all levels.



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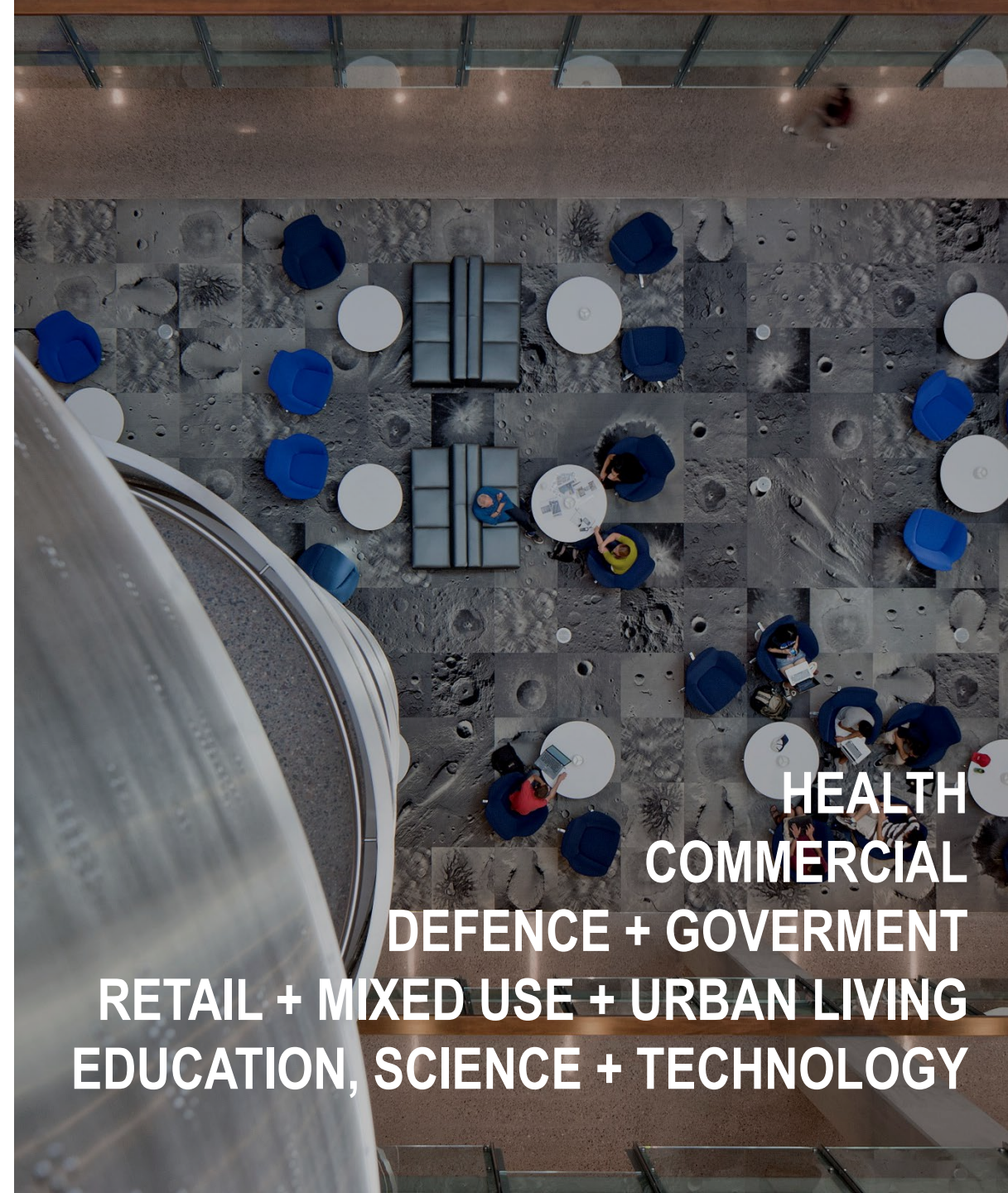
<https://www.linkedin.com/in/holger-de-groot-11741336/>



# HDR Profile

HDR is a creative firm for **architecture and engineering** with experience spanning **over 40 years in the Australian market**.

With more than **10,000 employees worldwide** in more than **200 offices around the globe**, we have access to highly informed best practice, innovative future-thinking and top talent from around the world, allowing us to contribute world-class intellect, expertise and specialist knowledge to our projects.



# HDR

## Global Presence

GLOBAL  
**225**  
OFFICES

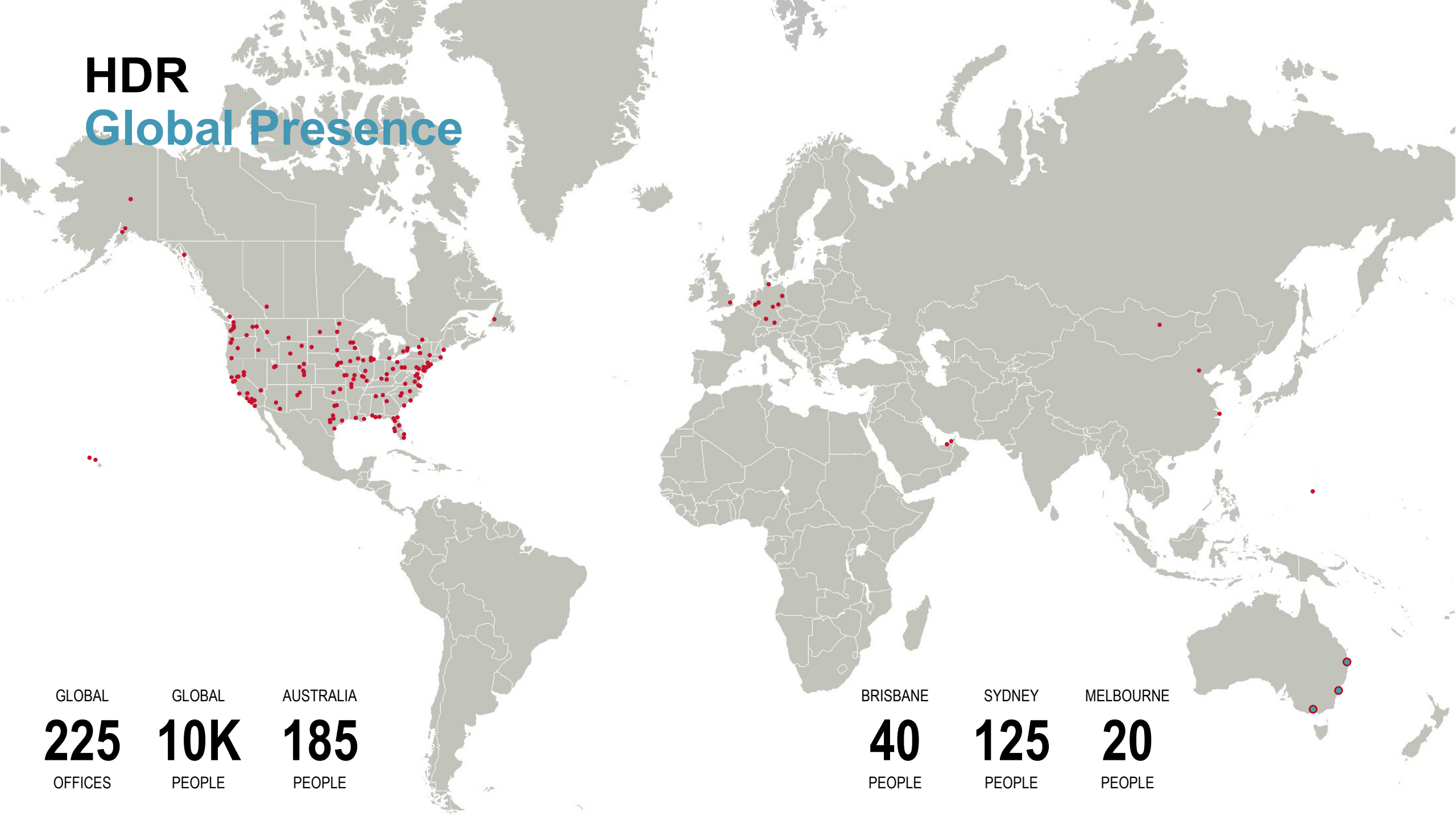
GLOBAL  
**10K**  
PEOPLE

AUSTRALIA  
**185**  
PEOPLE

BRISBANE  
**40**  
PEOPLE

SYDNEY  
**125**  
PEOPLE

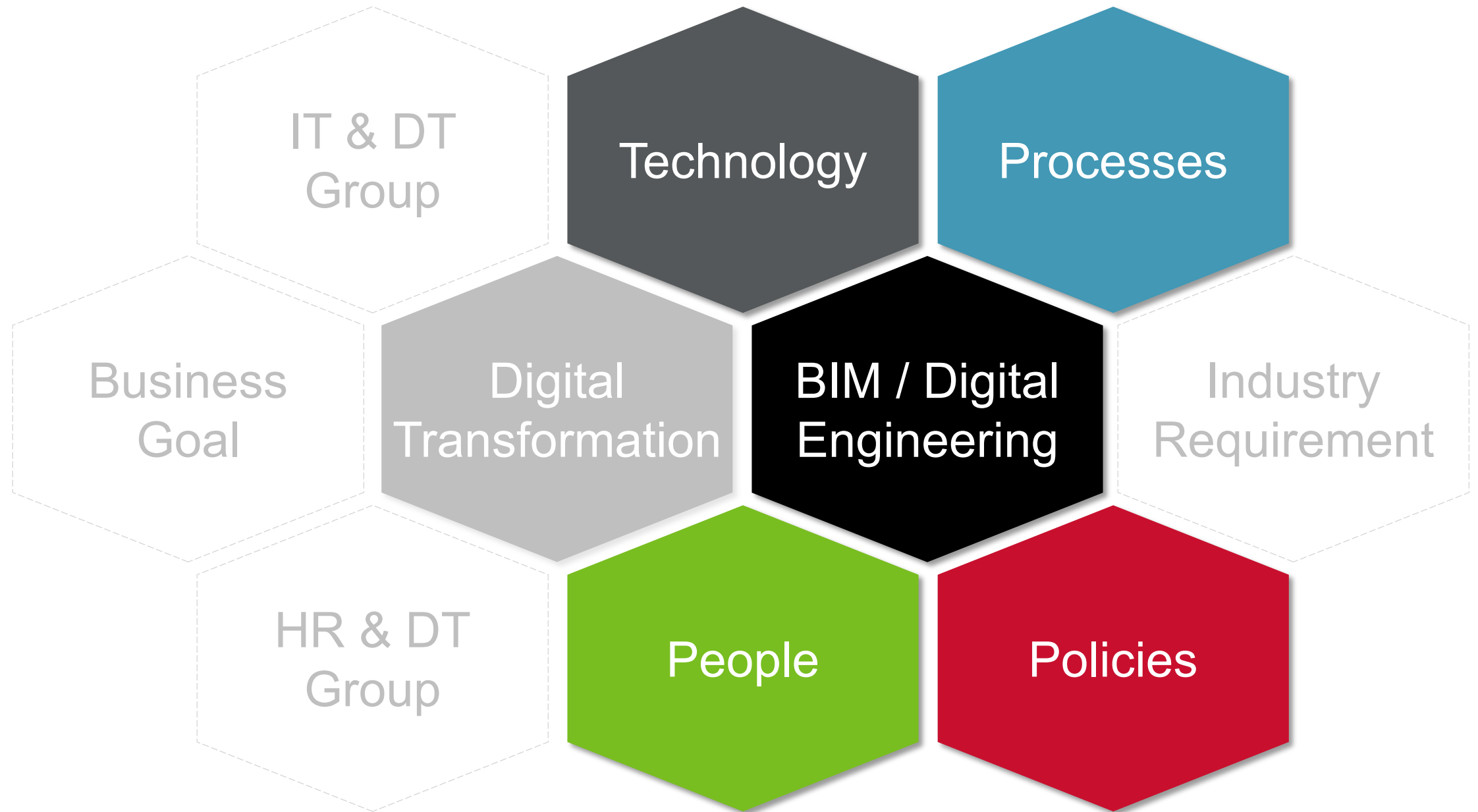
MELBOURNE  
**20**  
PEOPLE



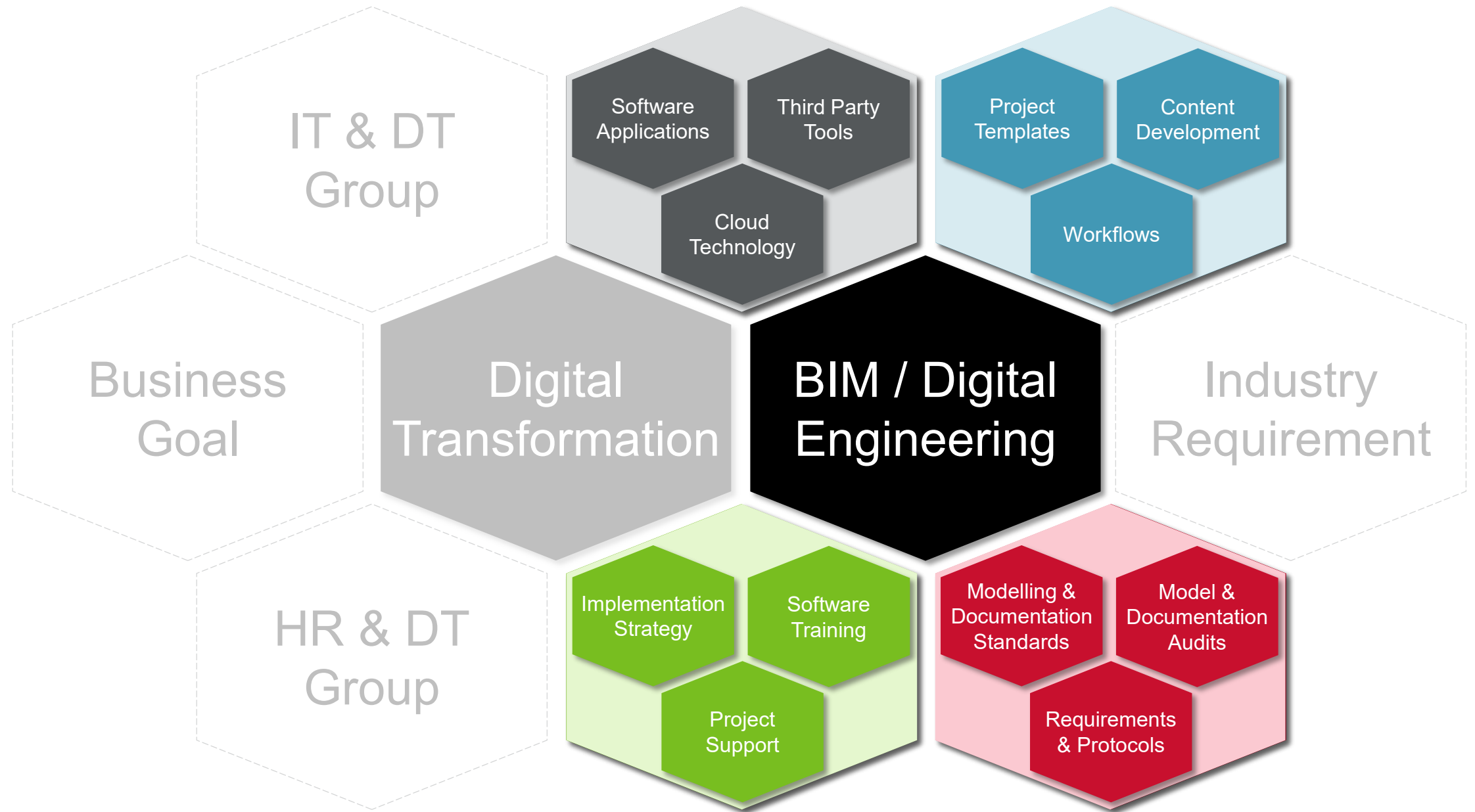


A man in a dark suit stands with his back to the camera, his hands clasped behind him. He is looking at a wall that is entirely covered with a dense pattern of interlocking gears of various sizes. The gears are rendered in shades of gray and white, creating a complex, mechanical texture. The floor is a light blue-gray color with a subtle wood grain pattern. The overall image conveys a sense of complexity, engineering, and the interconnectedness of systems.

# BIM and Digital Engineering



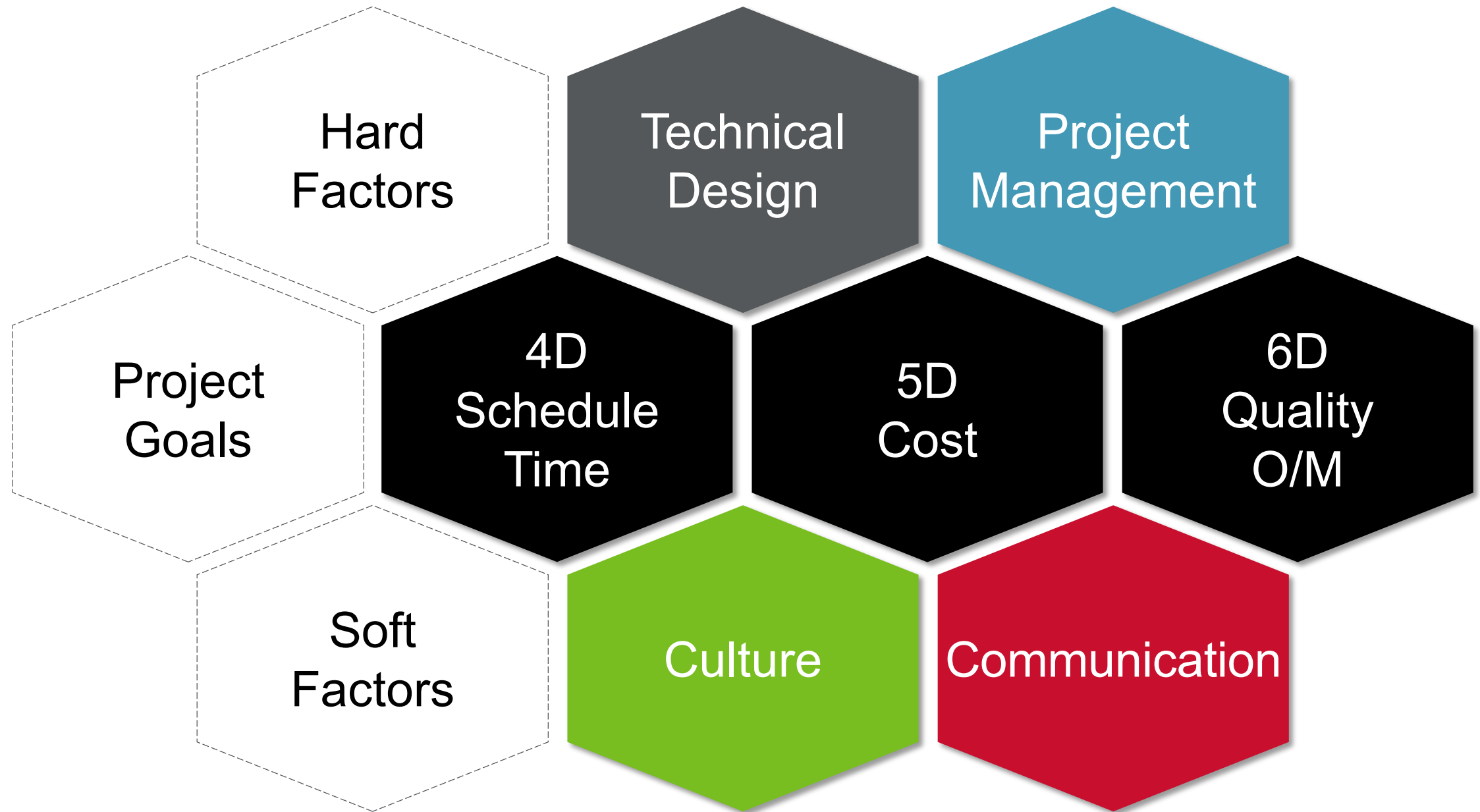


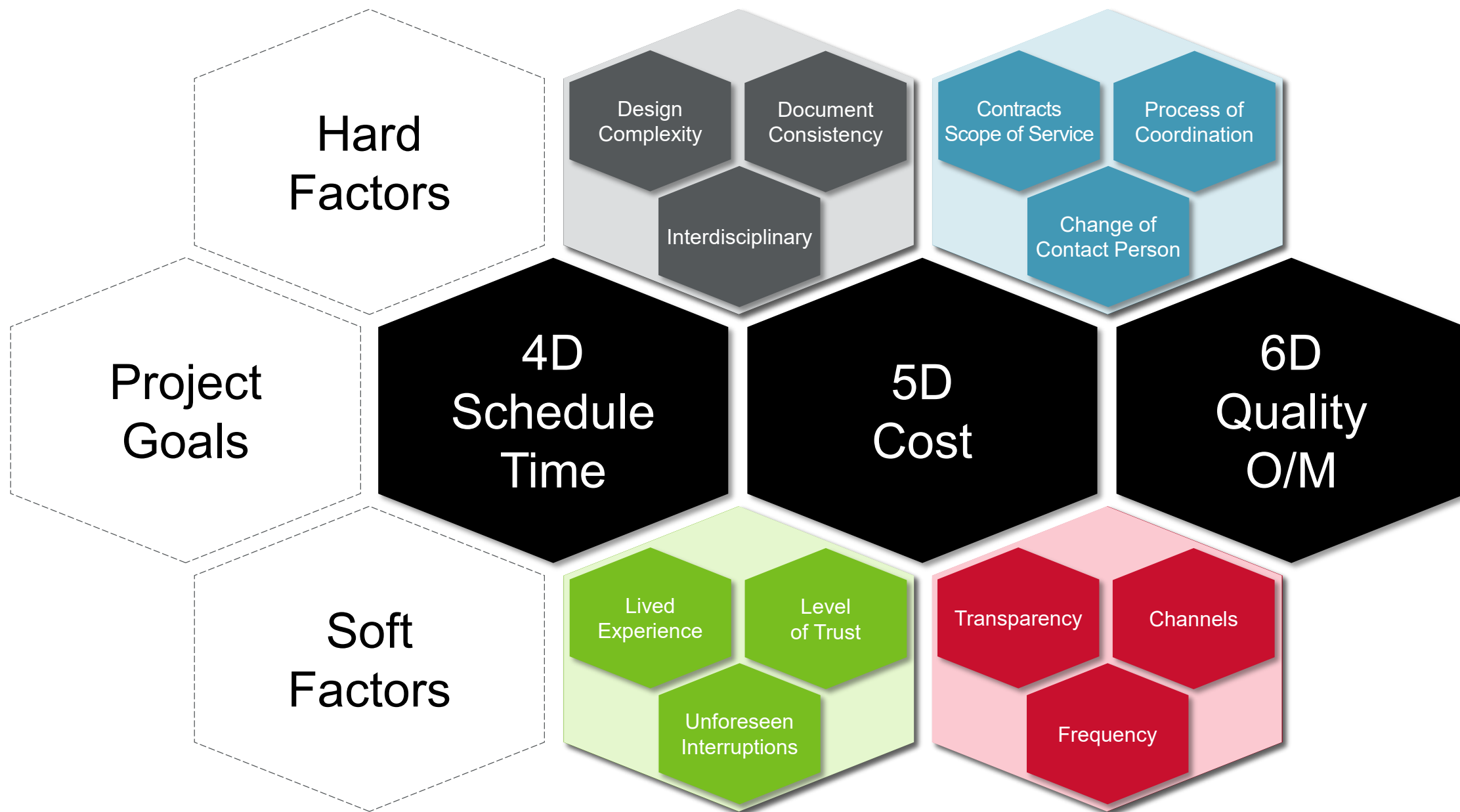




# **Project Goals and Challenges**



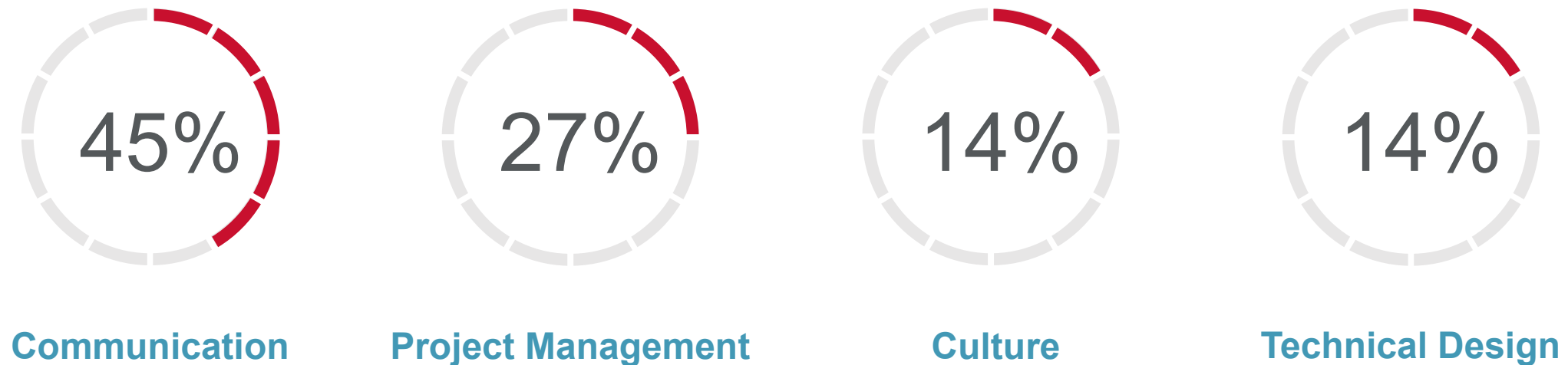






# What is the biggest Challenge?

Communication is the centre of all project processes. The purpose of communication is information transfer.



The data is based on a scientific survey which was undertaken by the Institute of Construction Management and Digital Engineering (ICoM) in 2017, involving project leaders in the field of Architecture, Engineering and Construction as well as Infrastructure and Civil Engineering.



# Project Lifecycle Management

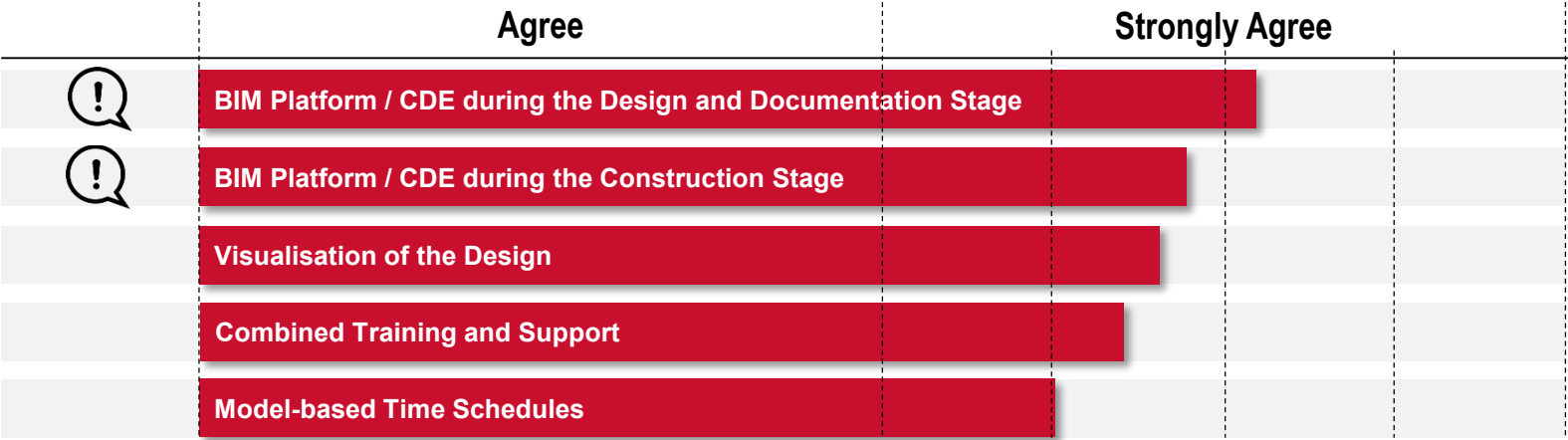


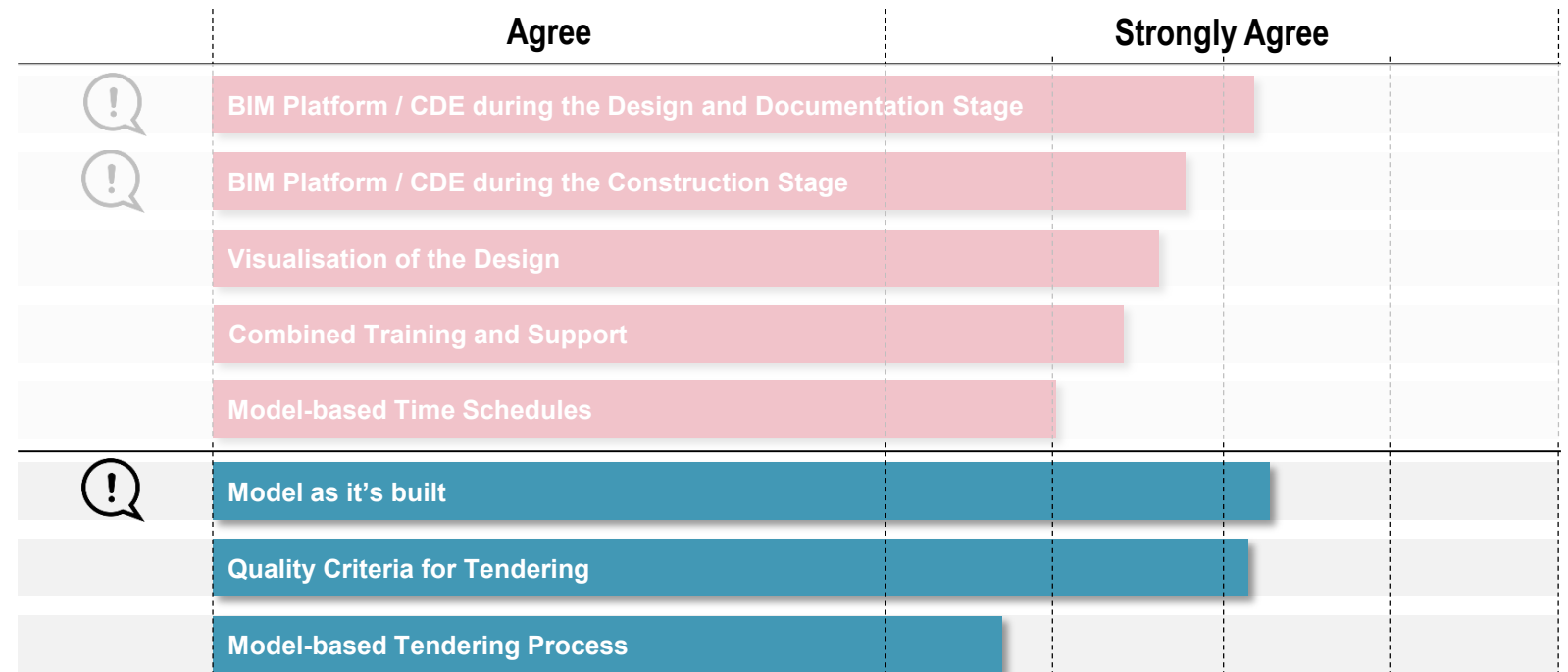
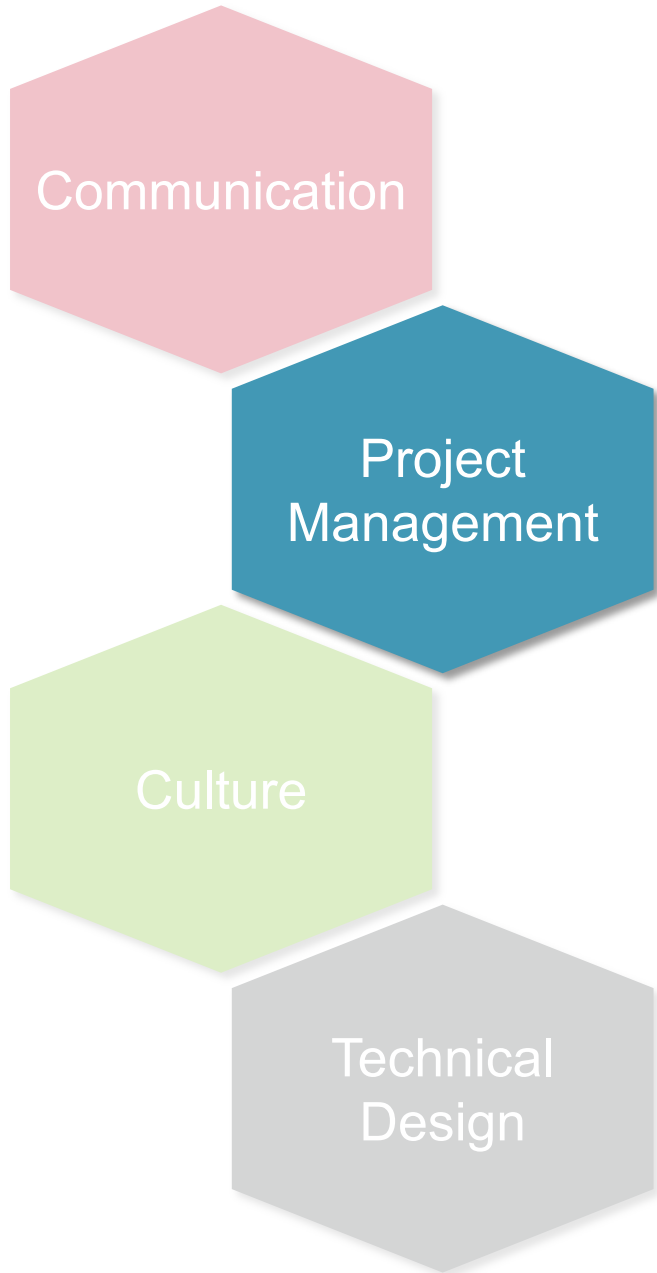
Communication

Project Management

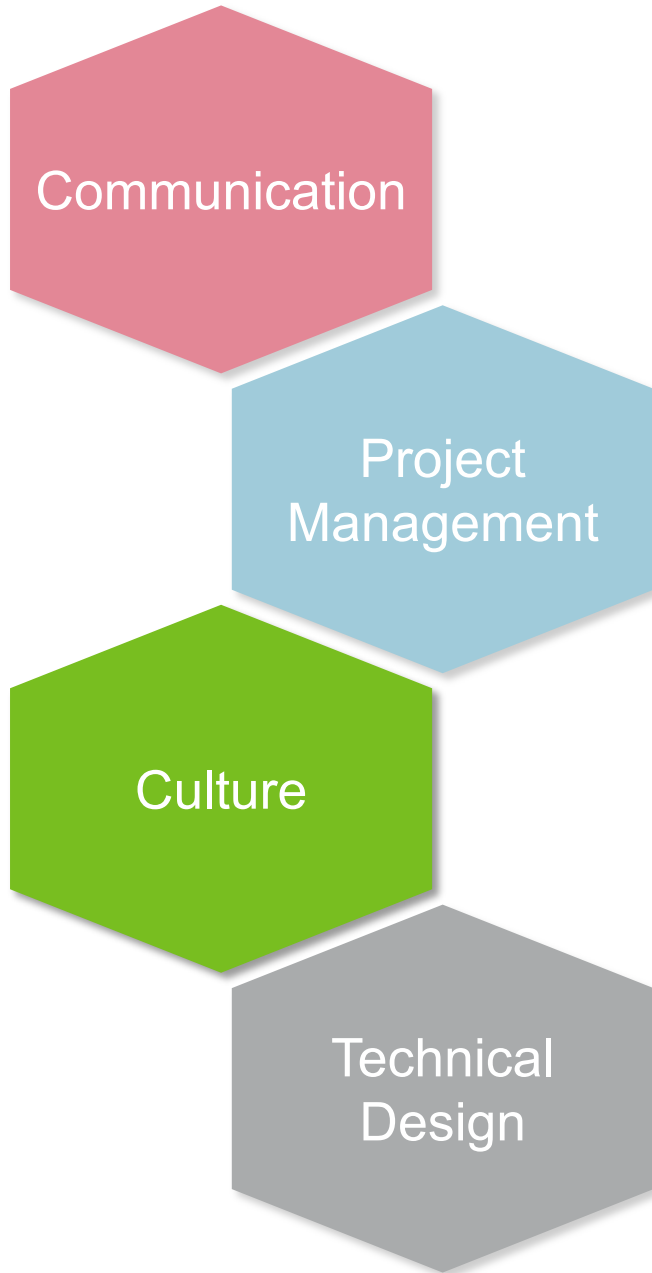
Culture

Technical Design

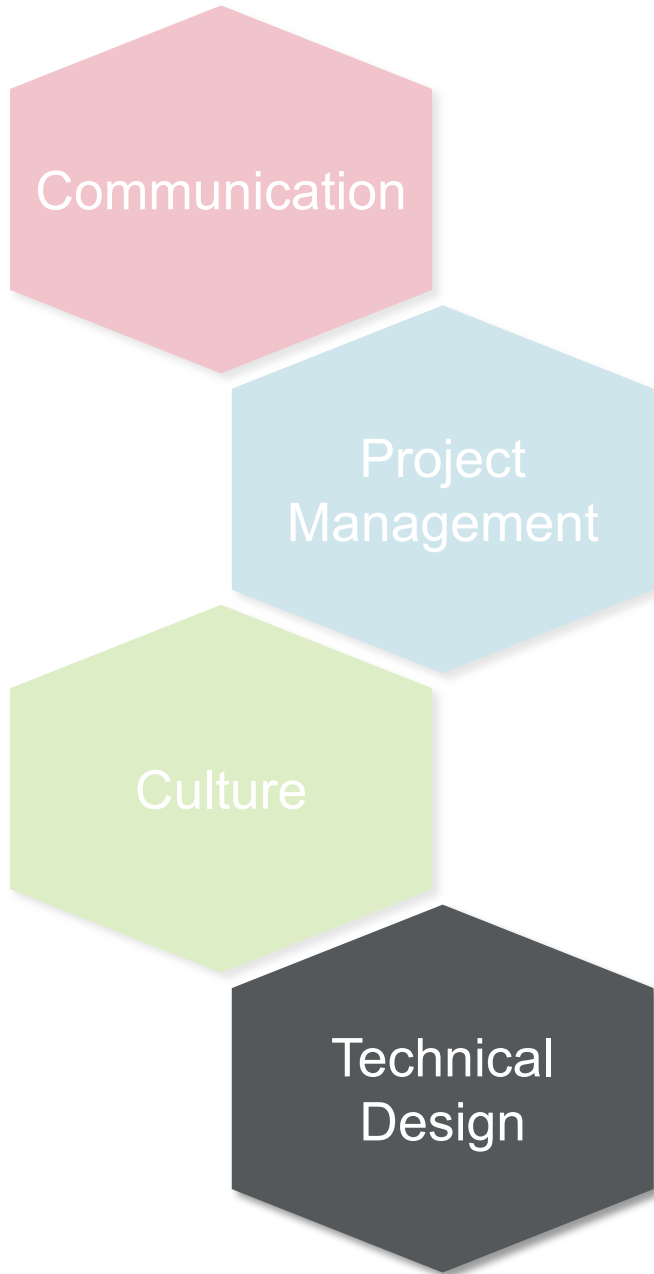








	Agree	Strongly Agree		
!	BIM Platform / CDE during the Design and Documentation Stage			
!	BIM Platform / CDE during the Construction Stage			
	Visualisation of the Design			
	Combined Training and Support			
	Model-based Time Schedules			
!	Model as it's built			
	Quality Criteria for Tendering			
	Model-based Tendering Process			
!	Transparency for Risk Management			
	Digital Validation of Time and Costs			
	Cooperation for Project Execution			
	Model-based Supplements			



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Model-based Tendering Process			
! Transparency for Risk Management			
Digital Validation of Time and Costs			
Cooperation for Project Execution			
Model-based Supplements			
! Model-based 3D Coordination			
! Defined Exchange Information Requirements & BIM Management Plan			
Data-Drop Points / Virtual Design Reviews			

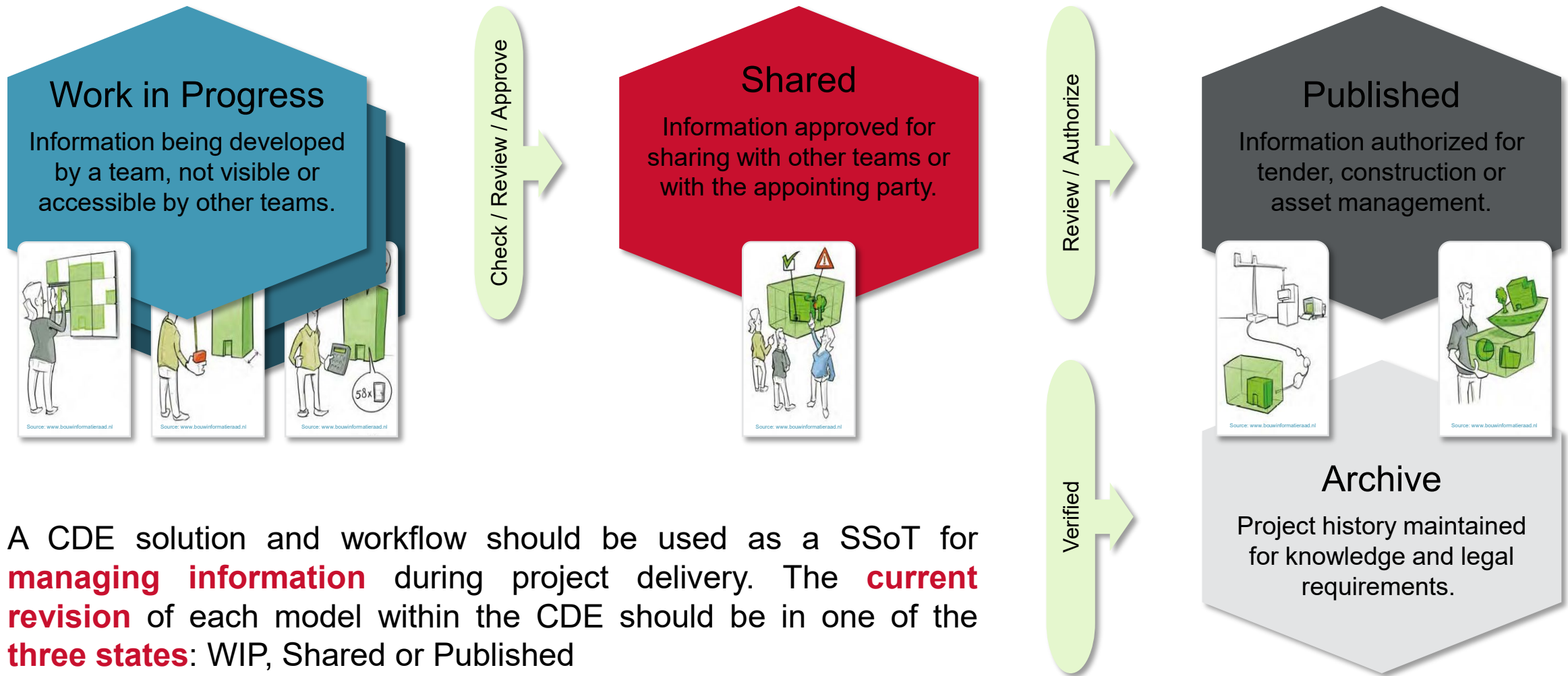


A close-up photograph of a network switch or patch panel. Several Ethernet cables are plugged into the ports. In the foreground, a blue RJ45 connector is visible on the left, and a white RJ45 connector is in the center. Below them, an orange RJ45 connector is partially visible. The cables themselves are blue, white, and orange. The background is a soft, out-of-focus green.

**Common Data Environment**

# Common Data Environment - Single Source of Truth

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# Common Data Environment - Cloud-based Collaboration

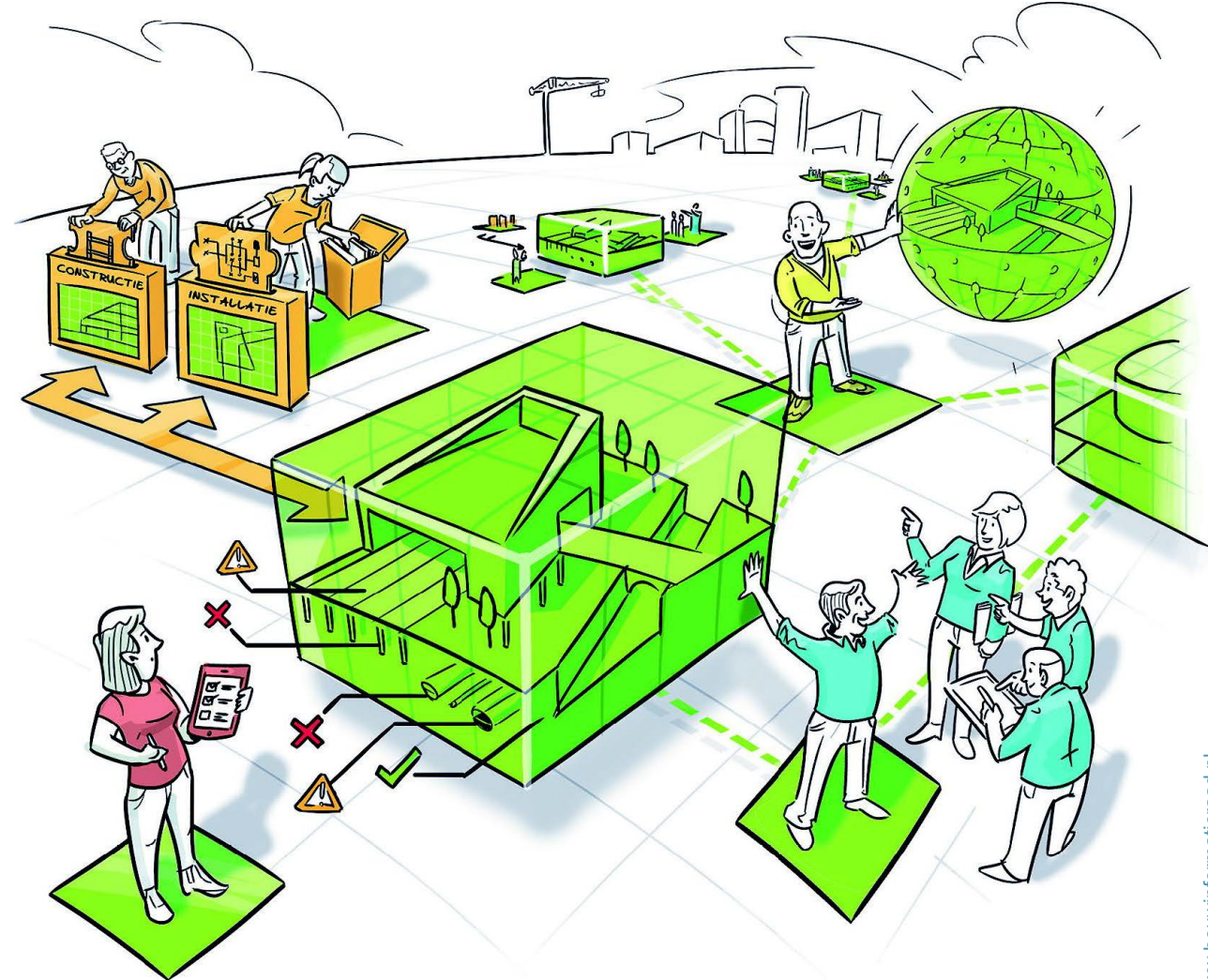
Enables BIM processes and the desire for **connectivity**.

Helps you to **improve communication** with extended project stakeholders.

Helps you to **reduce project errors** and to minimise data friction.

Allows you to **work from anywhere** to boost productivity.

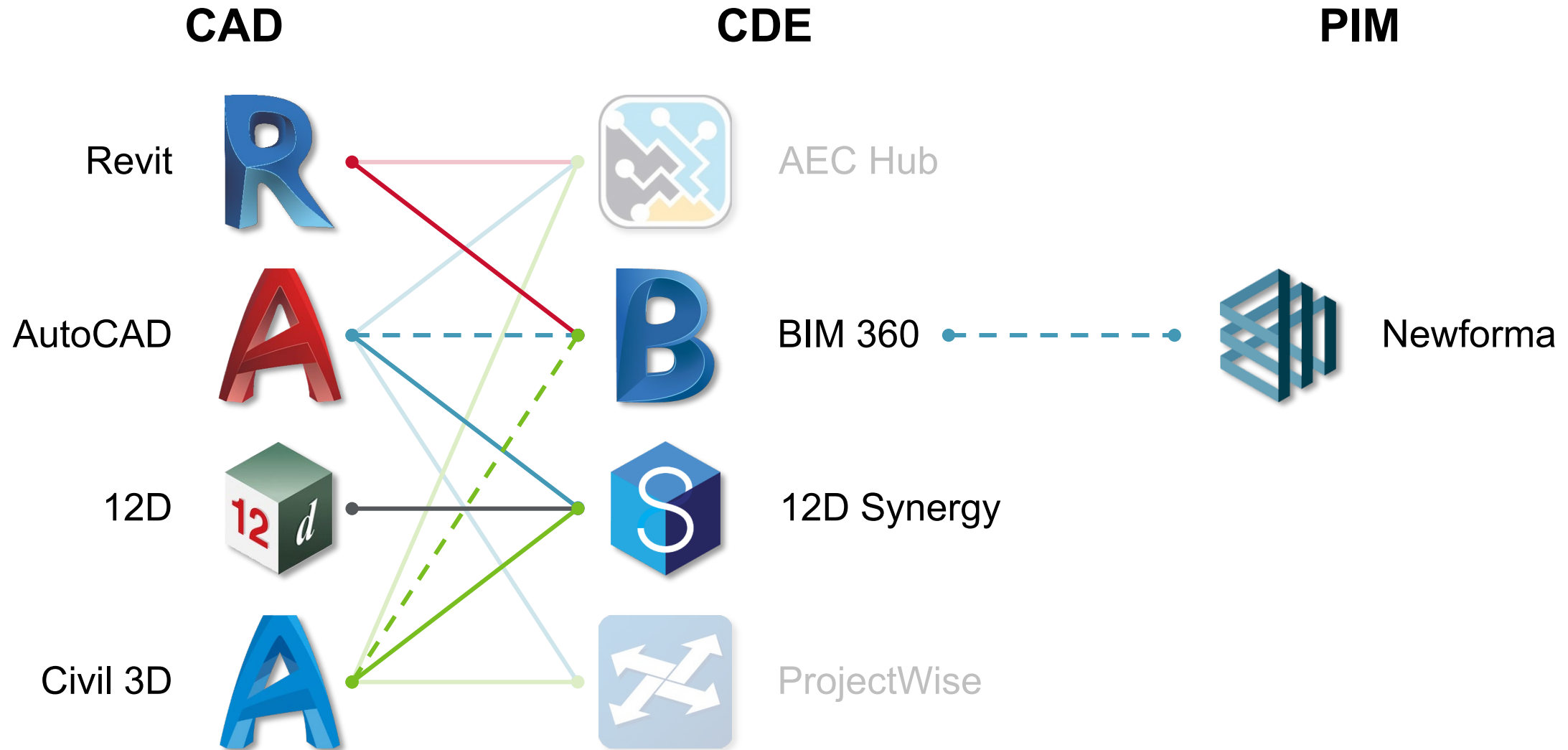
Allows you to reduce costs by **co-locating project teams** virtually.

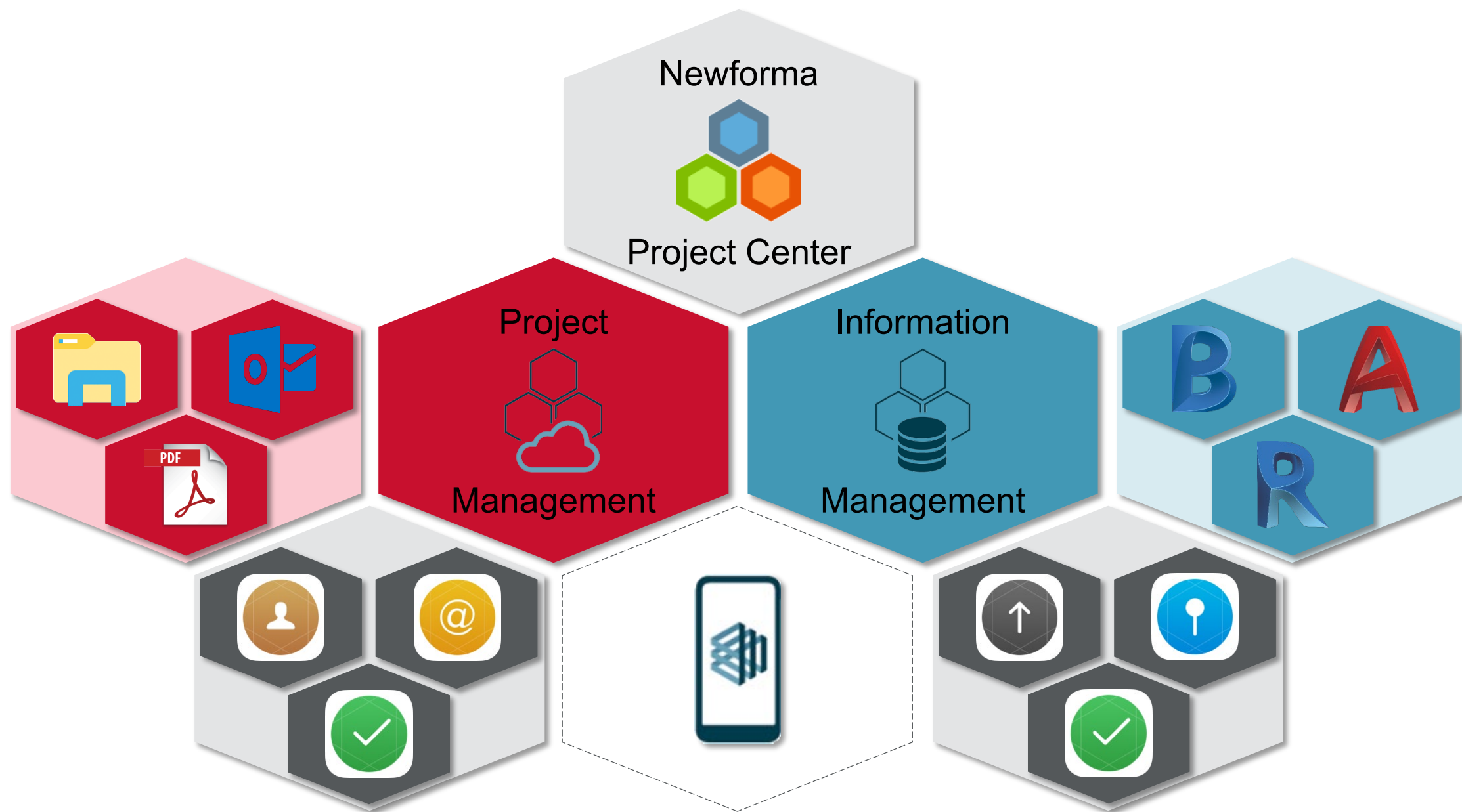




# Common Data Environment - Cloud-based Collaboration

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## BIM Supporting Documents





# BIM Supporting Documents for Collaboration

## Client / Owner

## BIM Consultant

To identify the true requirements of the user and make sure the asset solution has the right qualities and capabilities.

### Project BIM Brief

*Exchange  
Information  
Requirements*

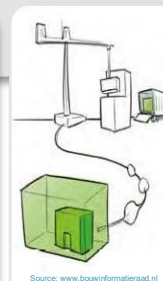


## Contractor

## BIM Manager / Coordinator (Project)

To allocate the responsibilities and key deliverables associated to each element of the Project Information Model.

### Level of Development Matrix



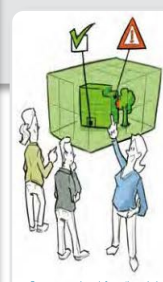
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## Consultant

## BIM Manager / Coordinator (Discipline)

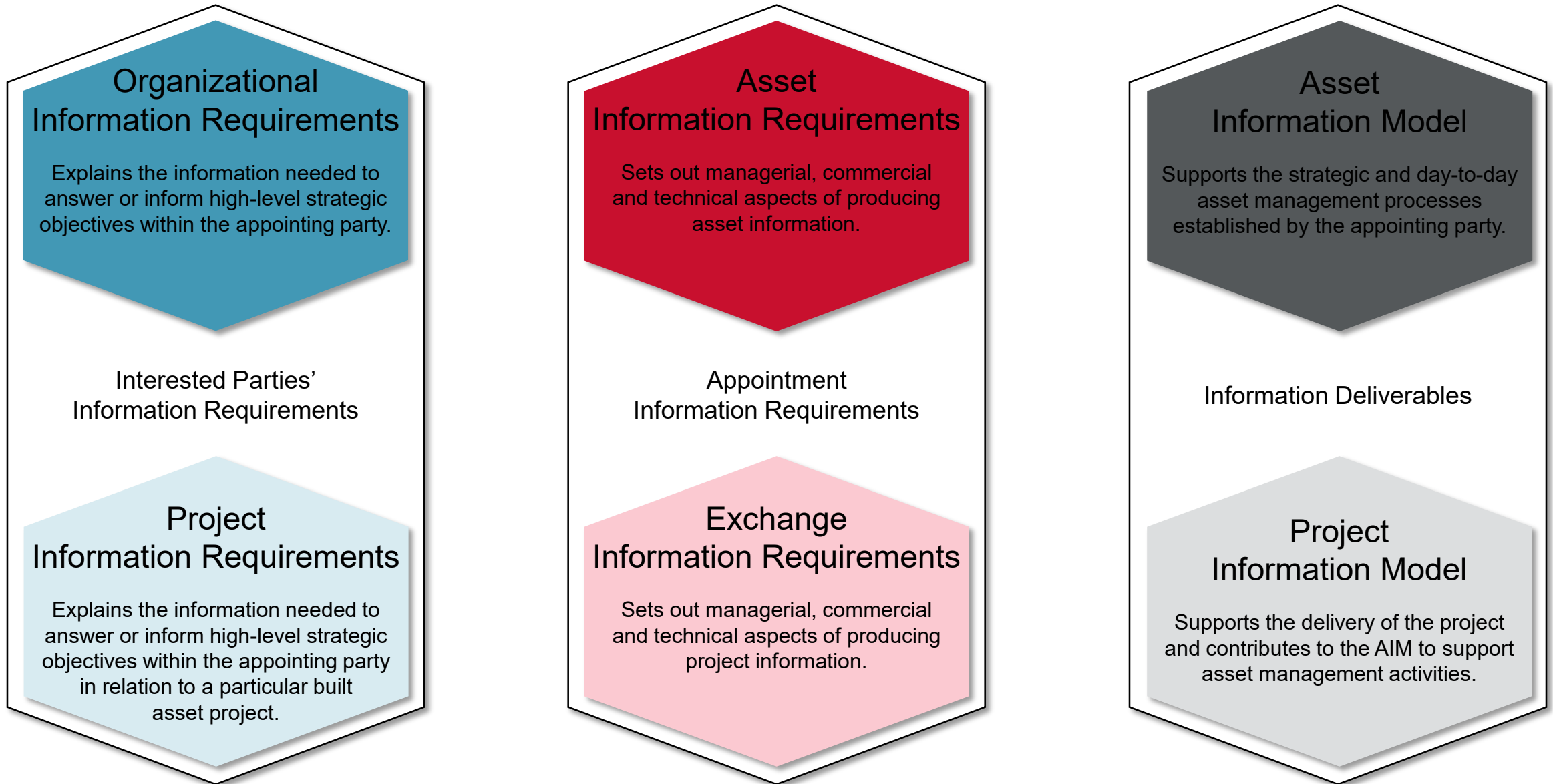
To plan and organize the work, mobilize the right resources, coordinate and control development.

### BIM Management (Execution) Plan



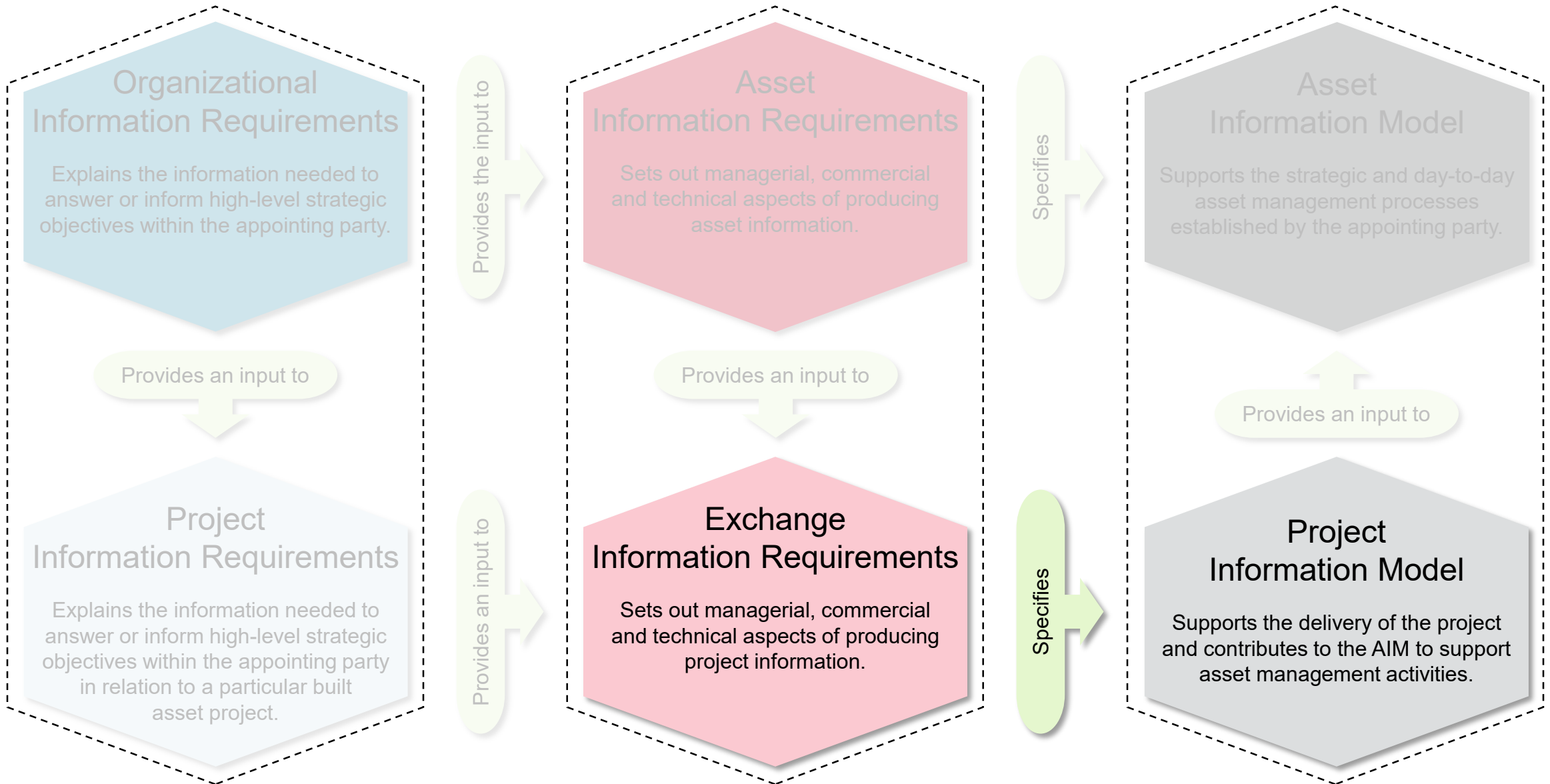
# Project BIM Brief (Exchange Information Requirements)

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# Project BIM Brief (Exchange Information Requirements)

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# LOD Specification (BIM Forum)

Licensed by the AIA, the **BIMForum** interpreted the “Levels of Development” for specific building components in its “**Level of Development (LOD) Specification**”, first published in **2013**.

The LOD Specification is **the point of reference of several BIM Guidelines in several countries** – including Australia, Canada, China, France, Germany, New Zealand, Singapore, Taiwan and USA.



		SD	DD	CD	Const. Coord	Fabrication
Building Systems	Model Elements					

#### PARTICIPATING ORGANIZATIONS



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# Level of Development Matrix

**Iteration 1:** The prospective lead appointed party shall consider the delivery team's (pre-appointment) LOD Matrix, containing the allocated **responsibility for each element** of the information model.

**Iteration 2:** Each task team shall consider the task team's responsibilities within the detailed LOD Matrix. The lead appointed party shall update the delivery team's high-level LOD Matrix (as required).

**Iteration 3:** The lead appointed party shall confirm the delivery team's high-level LOD Matrix in agreement with each appointed party.



Model Element by CSI UniFormat™ Classification	
<b>A SUBSTRUCTURE</b>	
<b>A10</b>	<b>FOUNDATIONS</b>
<b>A1010</b>	<b>Standard foundations</b>
A1010.10	Wall foundations
A1010.30	Column foundations
A1010.90	Standard foundation supplementary components
<b>Special foundations</b>	



# BIM Management (Execution) Plan

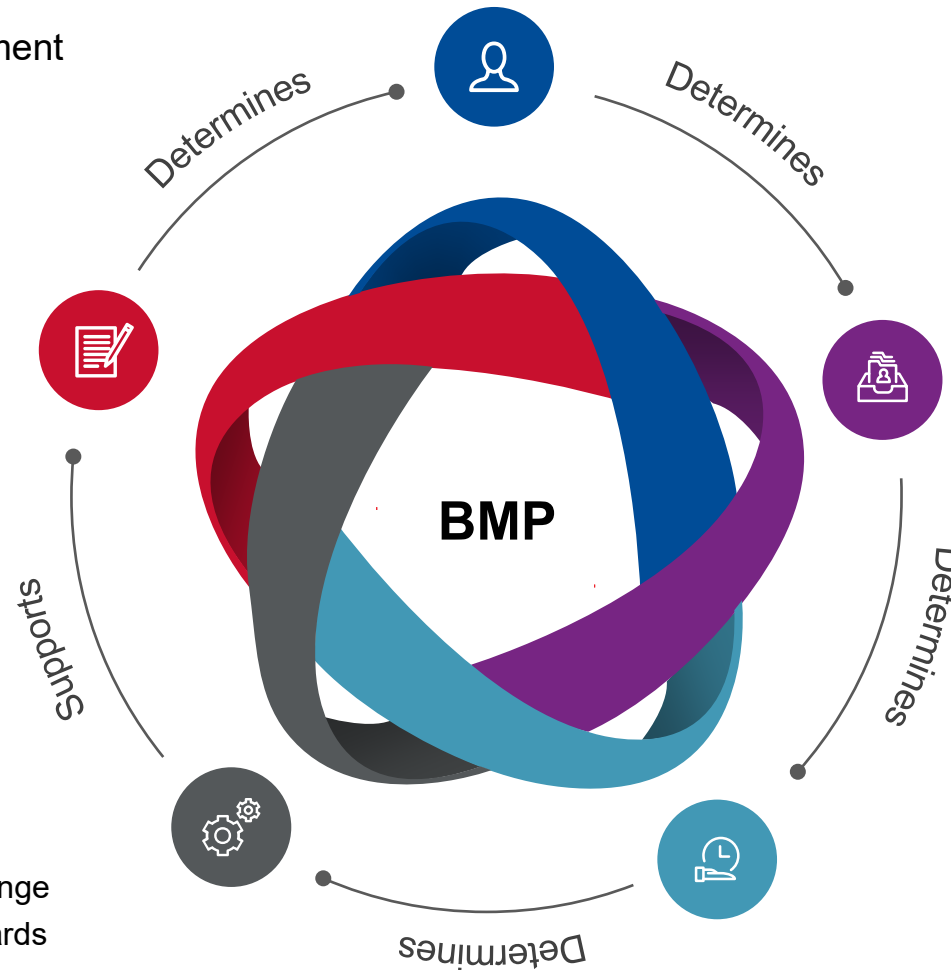
A BMP explains how the information management aspects of the appointment will be carried out by the delivery team.

## Why

- › Contractual Requirements
- › Project Procurement Strategy
- › Completion Dates

## How

- › Software Tools and Workflows
- › Collaborative Information Exchange
- › Digital Infrastructure and Standards



## Who

- › Project Team
- › Roles and Responsibilities
- › Organisational Structure

## What

- › Goals and Objectives
- › Exchange Information Requirements
- › Project Deliverables

## When

- › Project Deliverables
- › Program for Design (PFD)
- › Tasks and Activities

# BIM Management (Execution) Plan

**Iteration 1:** The prospective lead appointed party shall establish the **delivery team's (pre-appointment) BMP**, to be included within the prospective lead appointment party's tender response. The focus is on **'why'** including strategic considerations.

**Iteration 2:** Each task team shall undertake an assessment of their **capability and capacity to deliver information** in accordance with the appointing party's Project BIM Brief and the delivery team's proposed BMP. The focus is on the **'who'**, **'what'** and **'when'**.

**Iteration 3:** The lead appointed party shall **confirm the delivery team's BMP in agreement with each appointed party**. The focus is on the **'how'**.



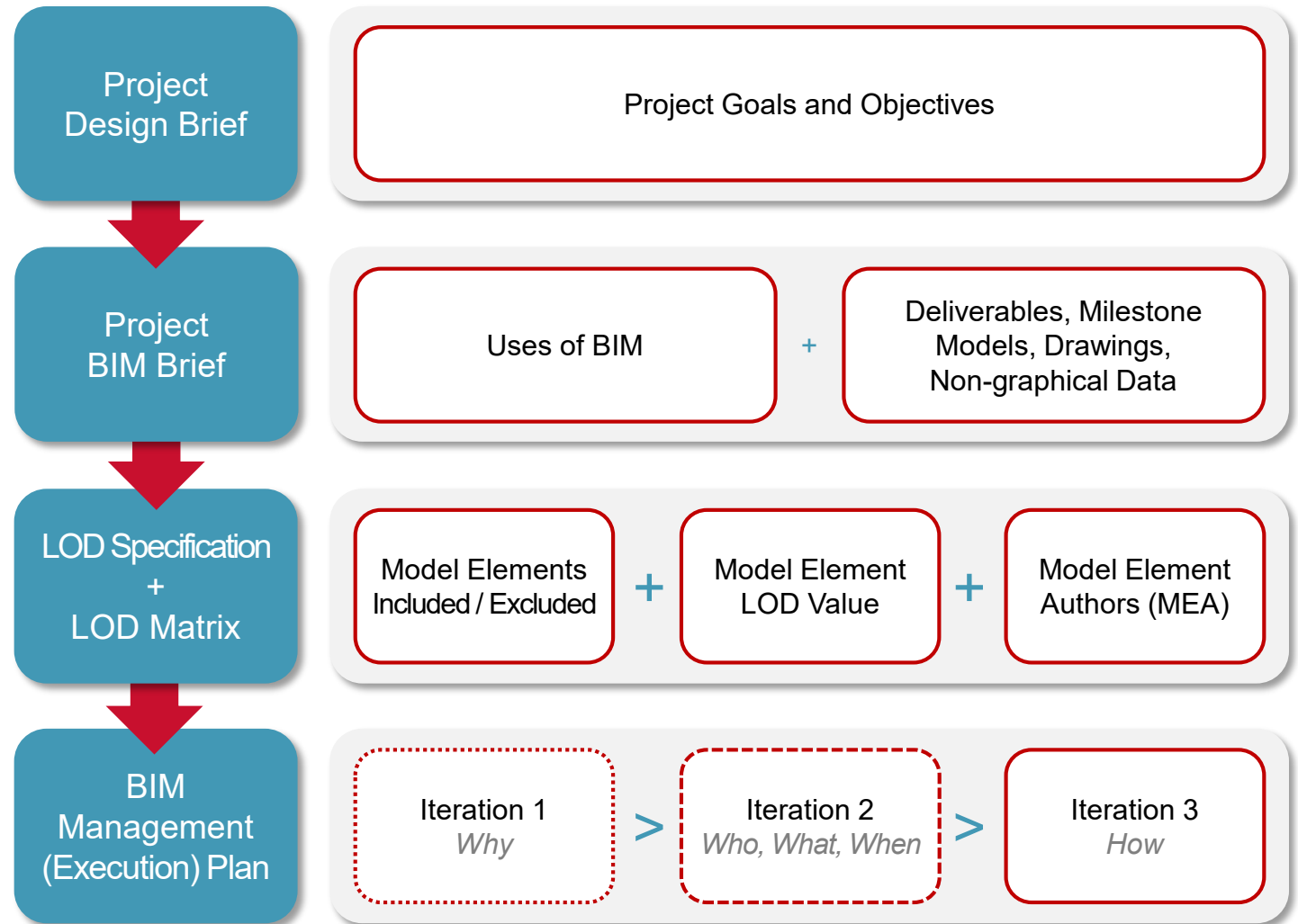
# BIM Supporting Documents for Collaboration

A Project Design Brief needs to be provided for example as part of the **tender package**.

Changing **Uses of BIM** during the project changes the **Scope of Service** and has contractual implications.

Contains the allocated **responsibility** and the key deliverables **associated to each element** of the Project Information Model.

BMP is a **living document** and shall be continually developed and refined throughout the project's lifecycle.





## Lessons Learned



# Lessons Learned

## Communication is the Key

A level of transparency in communication will not only improve the entire project lifecycle management, but it can also make a project run more efficiently.

## Common Data Environment

A CDE is critical to drive collaboration, providing the ability to create, share, and manage project information among internal and external teams.

## BIM Supporting Documents

A BMP is a living document, helping all project members to manage their responsibilities and expectations through effective communication.





Thank you.



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