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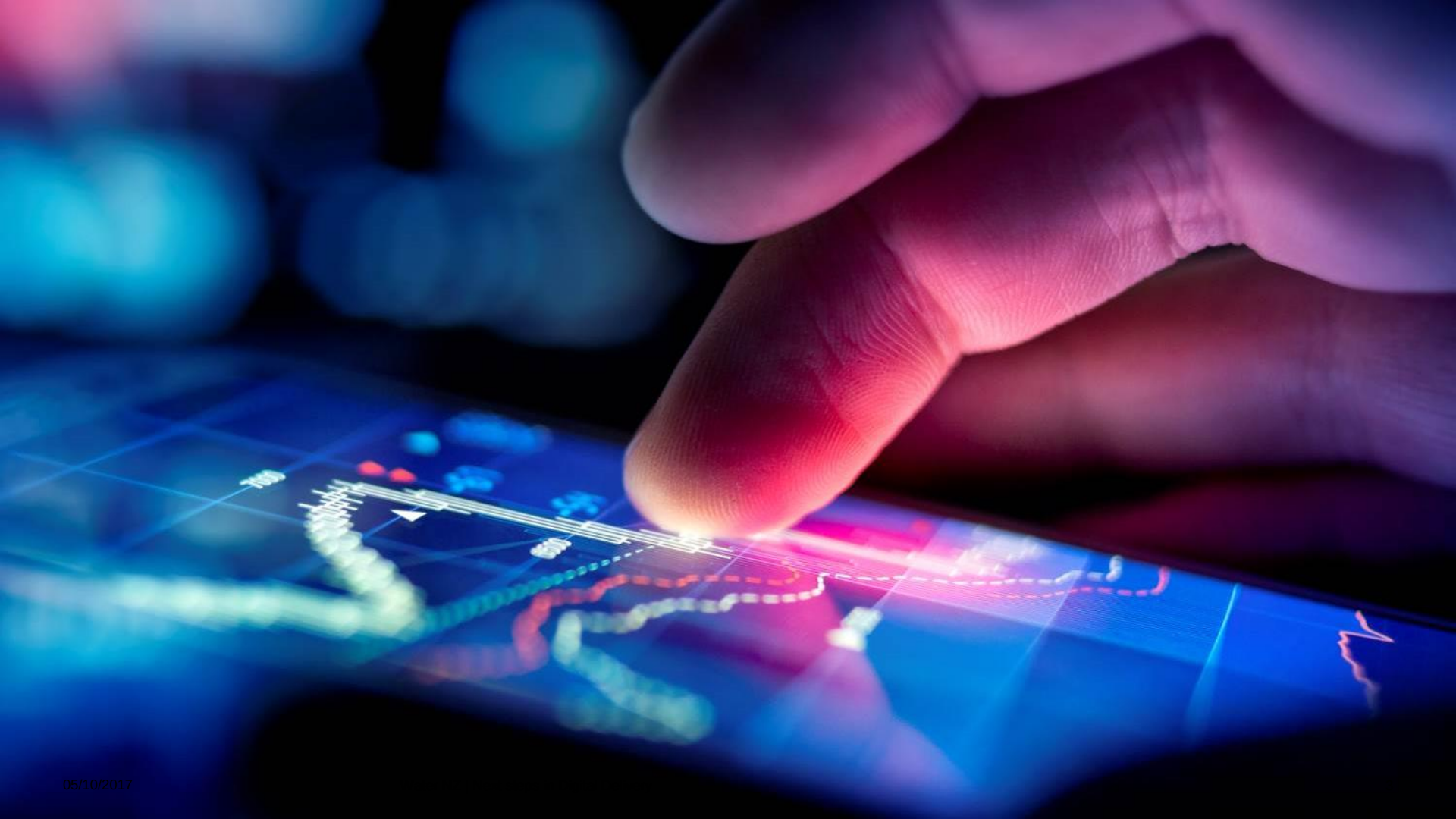
Taking the next Digital Steps

From BIM basics to Smart Infrastructure

Simon Kerr, Digital Delivery Principal

My background



A 3-fold transformation

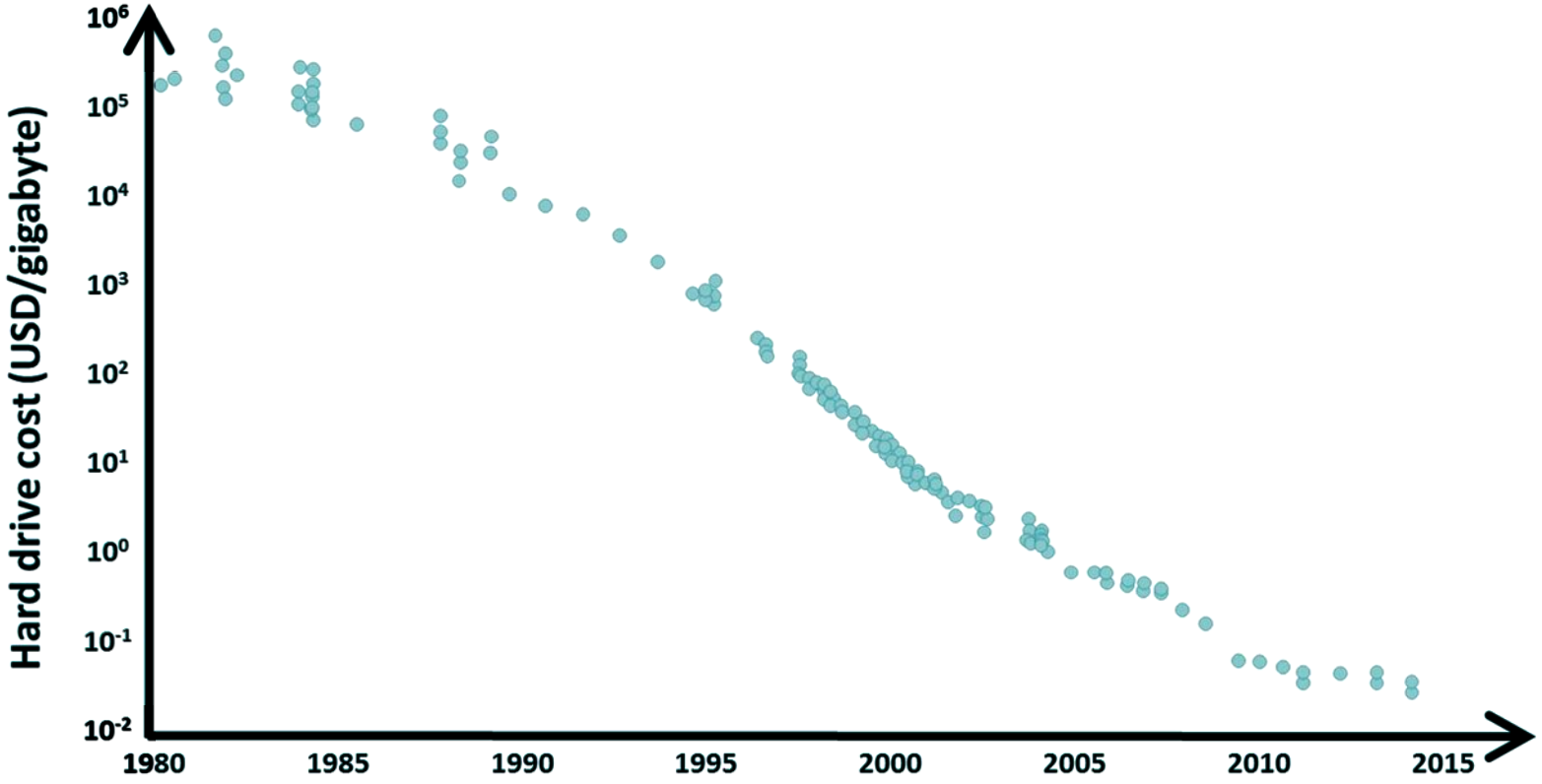
1 Transformation in Information

2 Transformation in Procurement

3 Transformation in Skills and Mindsets

The big picture case for change

Digital abundance



Digital abundance

Storing

from:
$700,000 per GB (1981)

to:
$0.04 per GB

Processing

from:
$1.1 trillion per GFLOPS (1961)

to:
$0.08 per GFLOPS

Transmitting

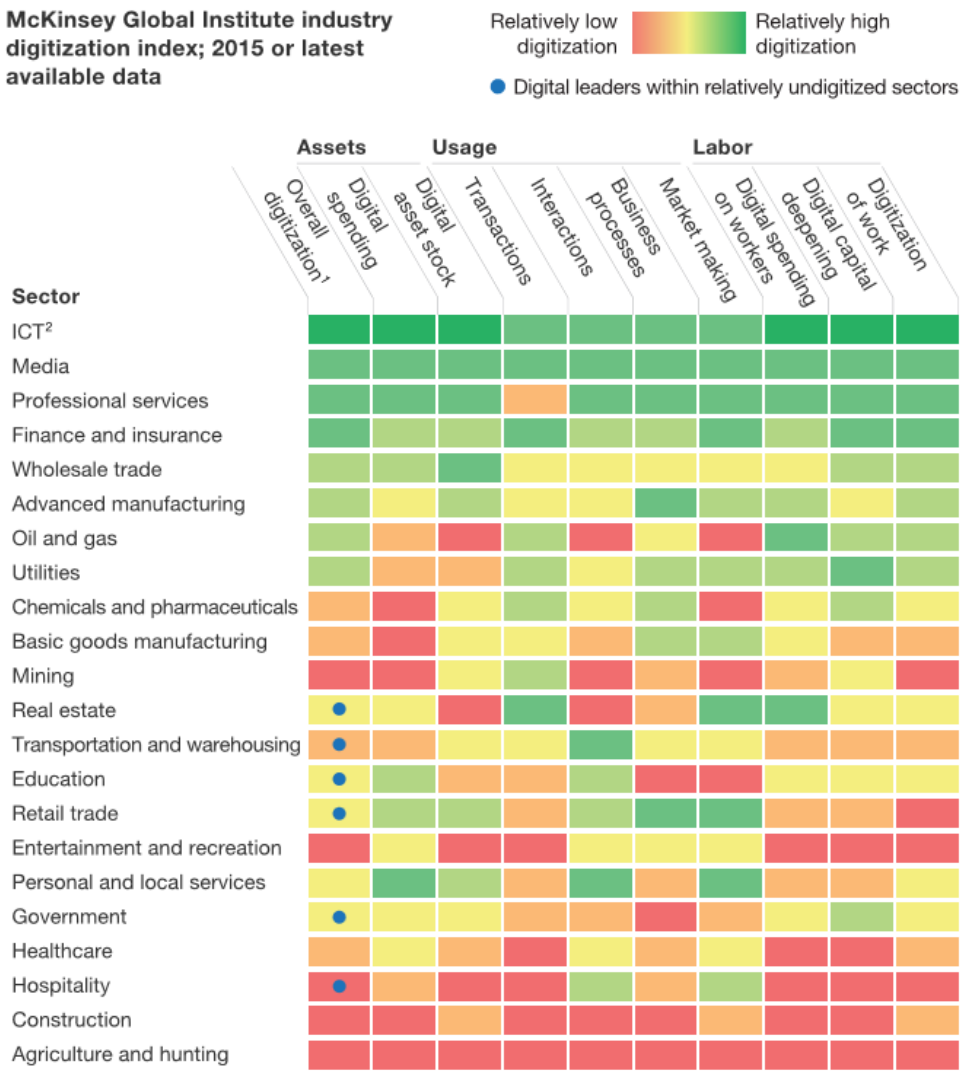
from:
$1,200 per Mbps (1998)

to:
$0.06 per Mbps

Digital abundance inevitably leads to a digital revolution

Construction is behind

"The construction industry is among the least digitized"



Source:
McKinsey&Company, "Imagining construction's digital future"
By R Agarwal, S Chandrasekaran, and M Sridhar

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Transformation in: Information

Symptoms of poor information management

plan1-dave's_edit.dwg

By the time my as builts arrived I'd forgotten what we'd built

I can't rely on my asset records – if I need to know what's there I'll go to site

It says X on the P&ID, Y on the GAs and Z on GIS

My O&M's in 15 languages and an inch thick

Resurvey for each new project

"I attached it to the email"

Modifying incorrect asset data is someone else's job

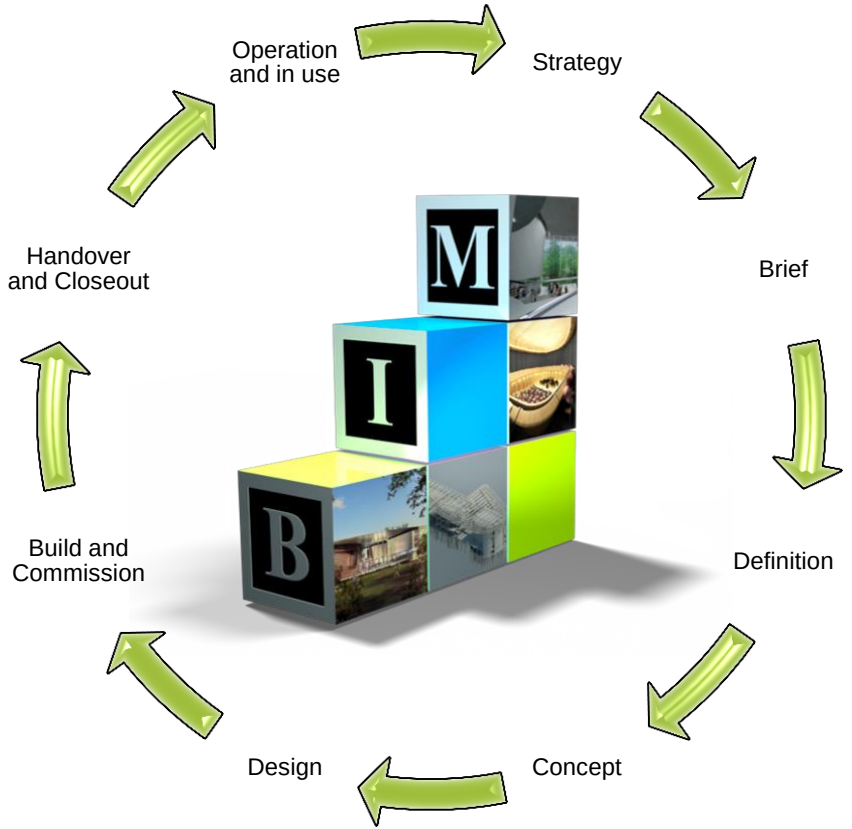
Our perception of the Value of Information needs to change

Time to get the house in order

The BIM Level 2 Basics

Better **I**nformation **M**anagement

"A coordinated set of **processes**, supported by technology, that adds **value** through creating, managing and sharing digital information about an **asset** throughout its **lifecycle**."



The BIM Level 2 Basics

Getting the house in order

1
Information Requirements
What questions am I answering and what information do I need to do that?

2
Common Data Environment
A rigorous, proven means of creating, sharing, managing information

3
Plan
A BIM Execution Plan / Information Delivery Plan

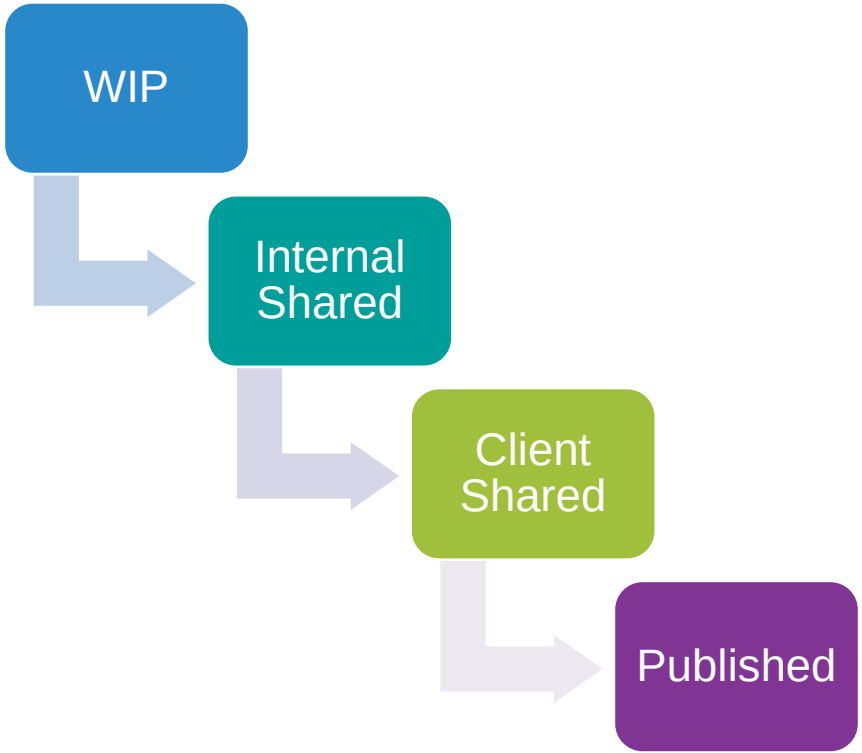
4
Information Exchange
Consider the lifecycle of information and how it will be exchanged

5
Naming Convention
Clear and unambiguous

6
Version and Revision
Single Source of Truth

Thames Tideway East

Getting the BIM Basics Right



Common Data Environment

Single source of truth; single process for all information

Progress reporting

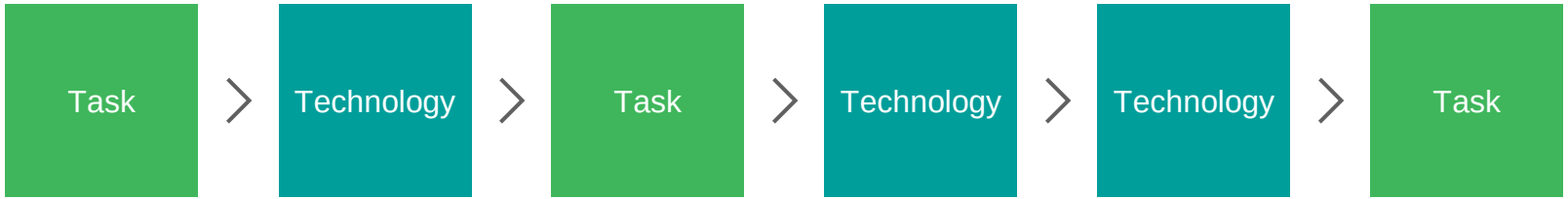
Earned value analysis based on information development

Analyse Performance

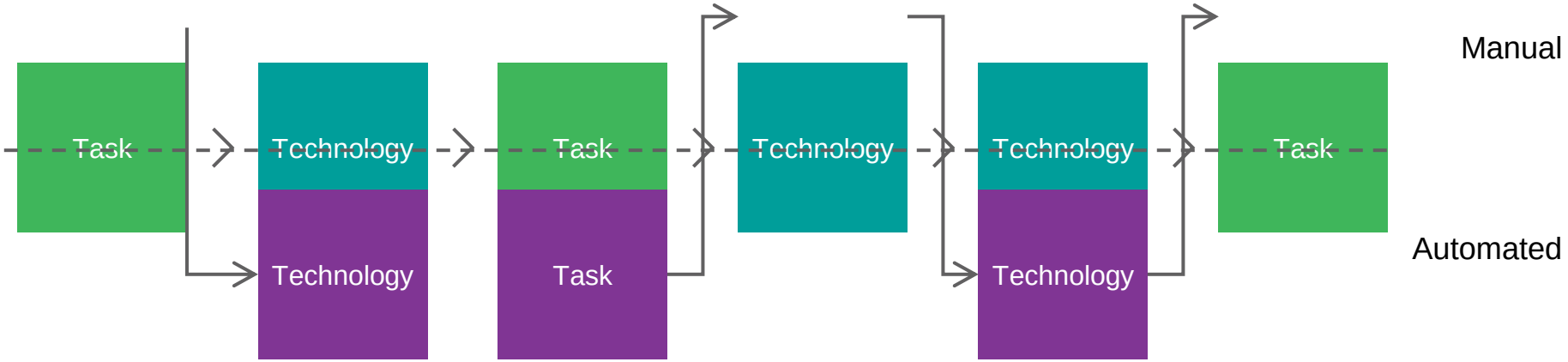
Proactively manage non-compliance

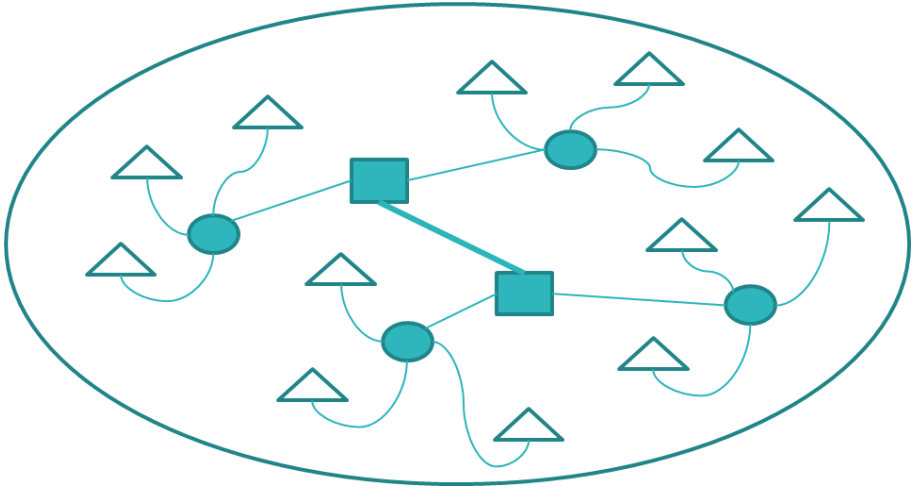
Digital Design: Process

Digital Design: Verified Technology

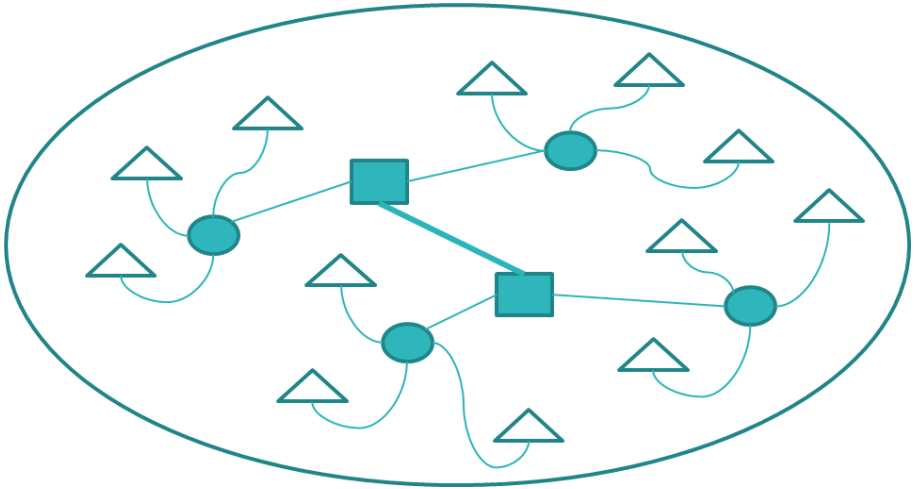


Digital Design: Automation

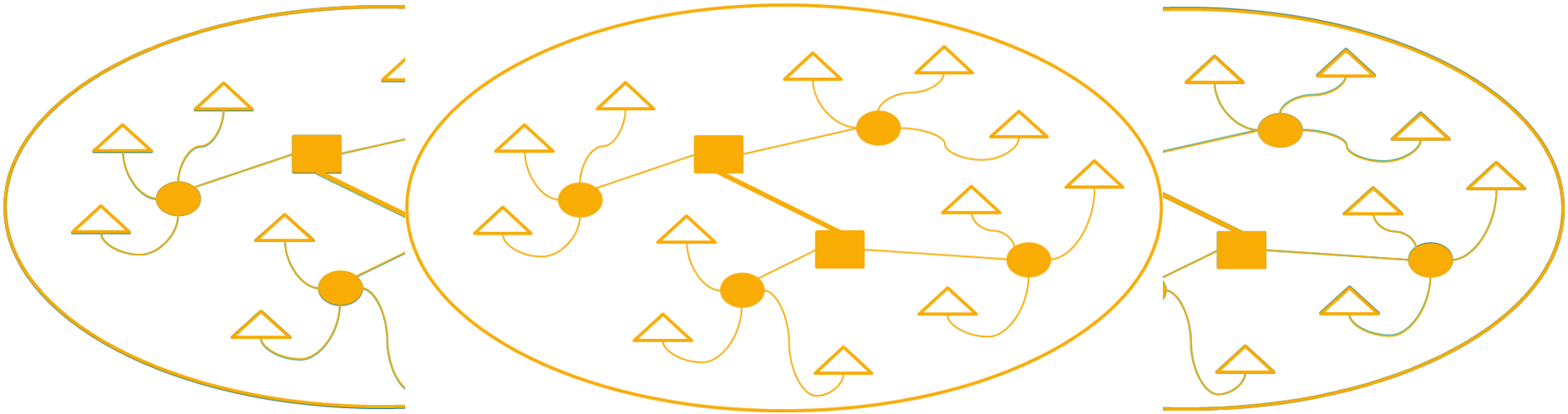




Physical infrastructure

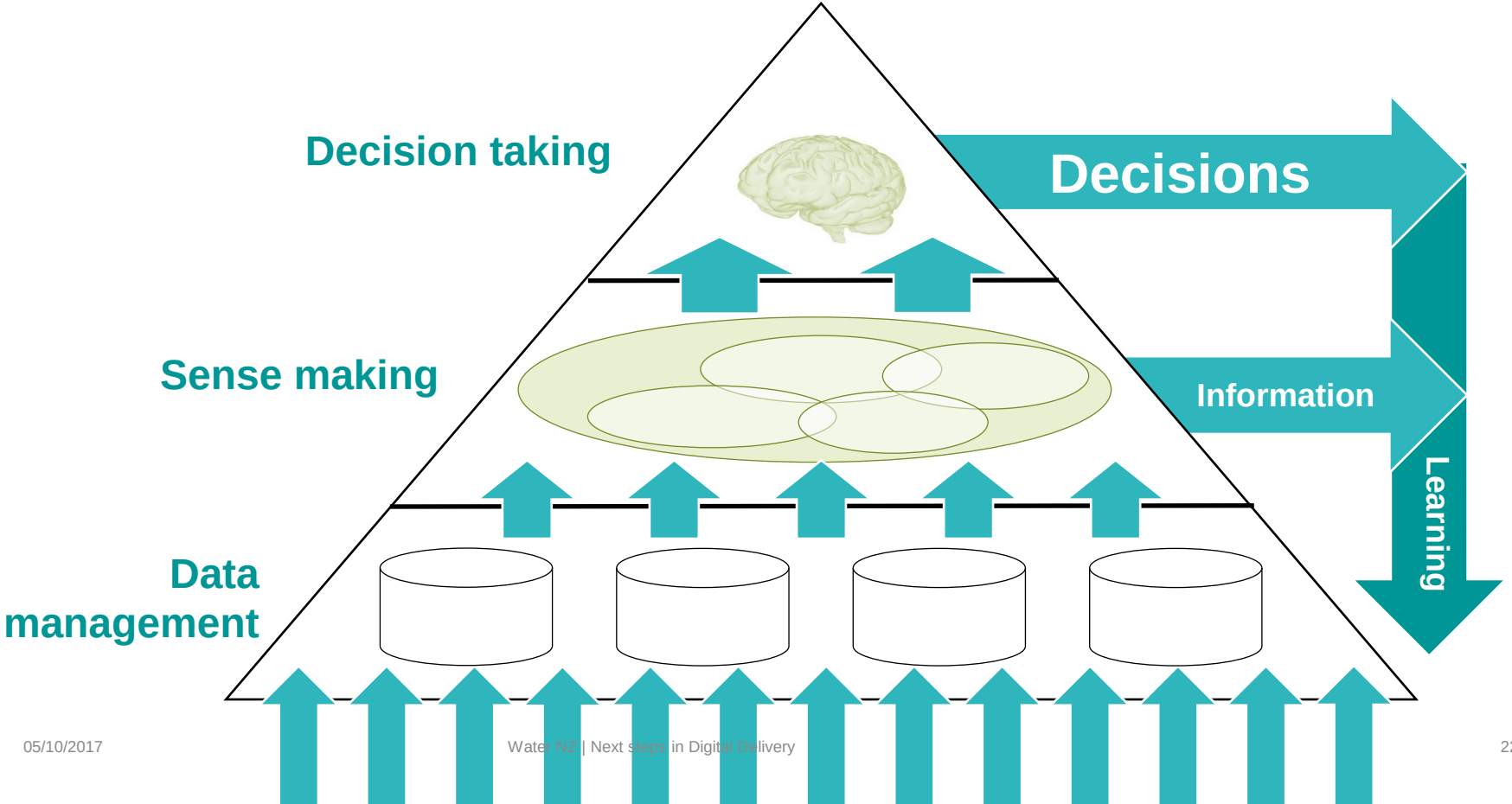


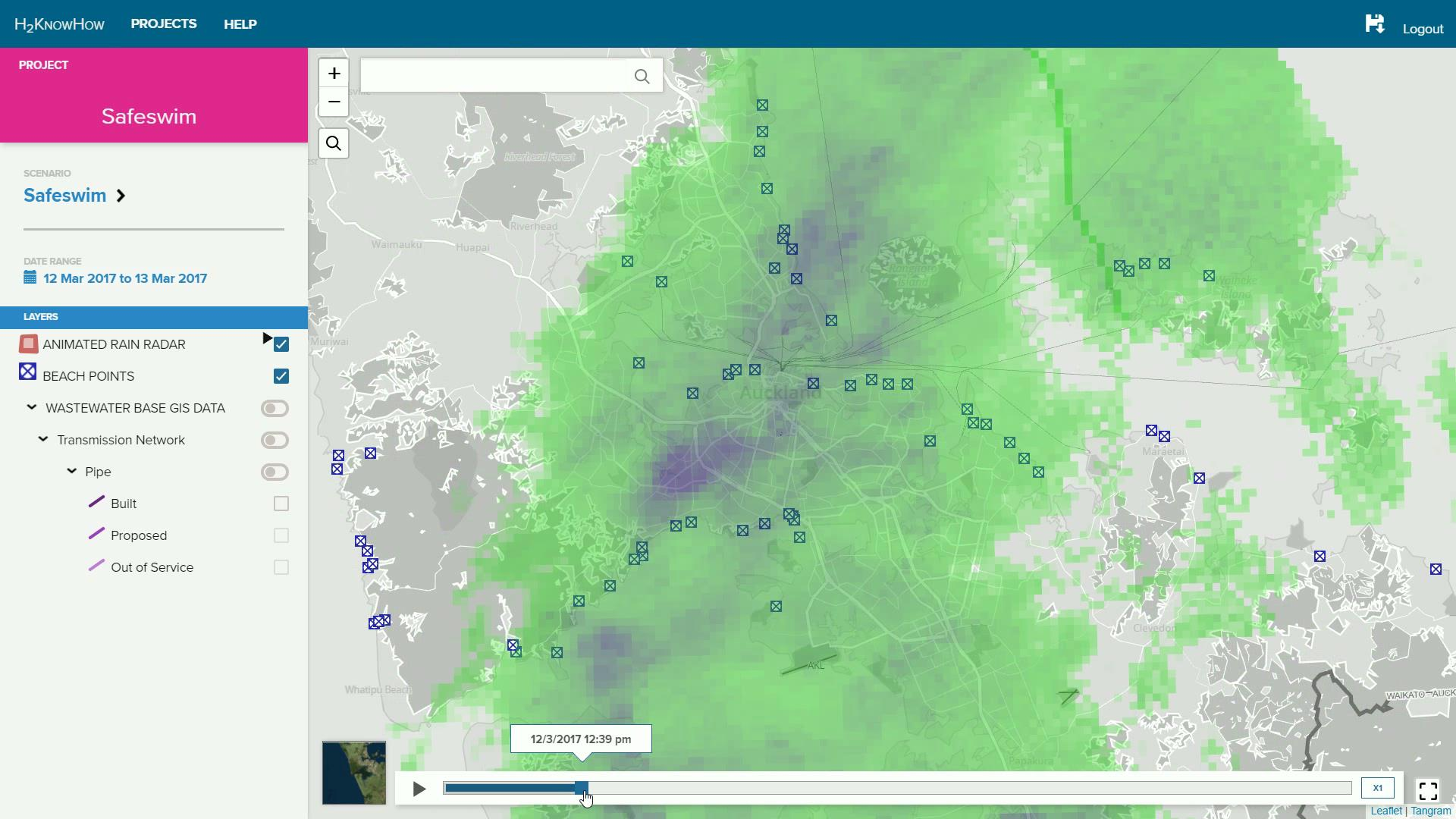
Digital twin



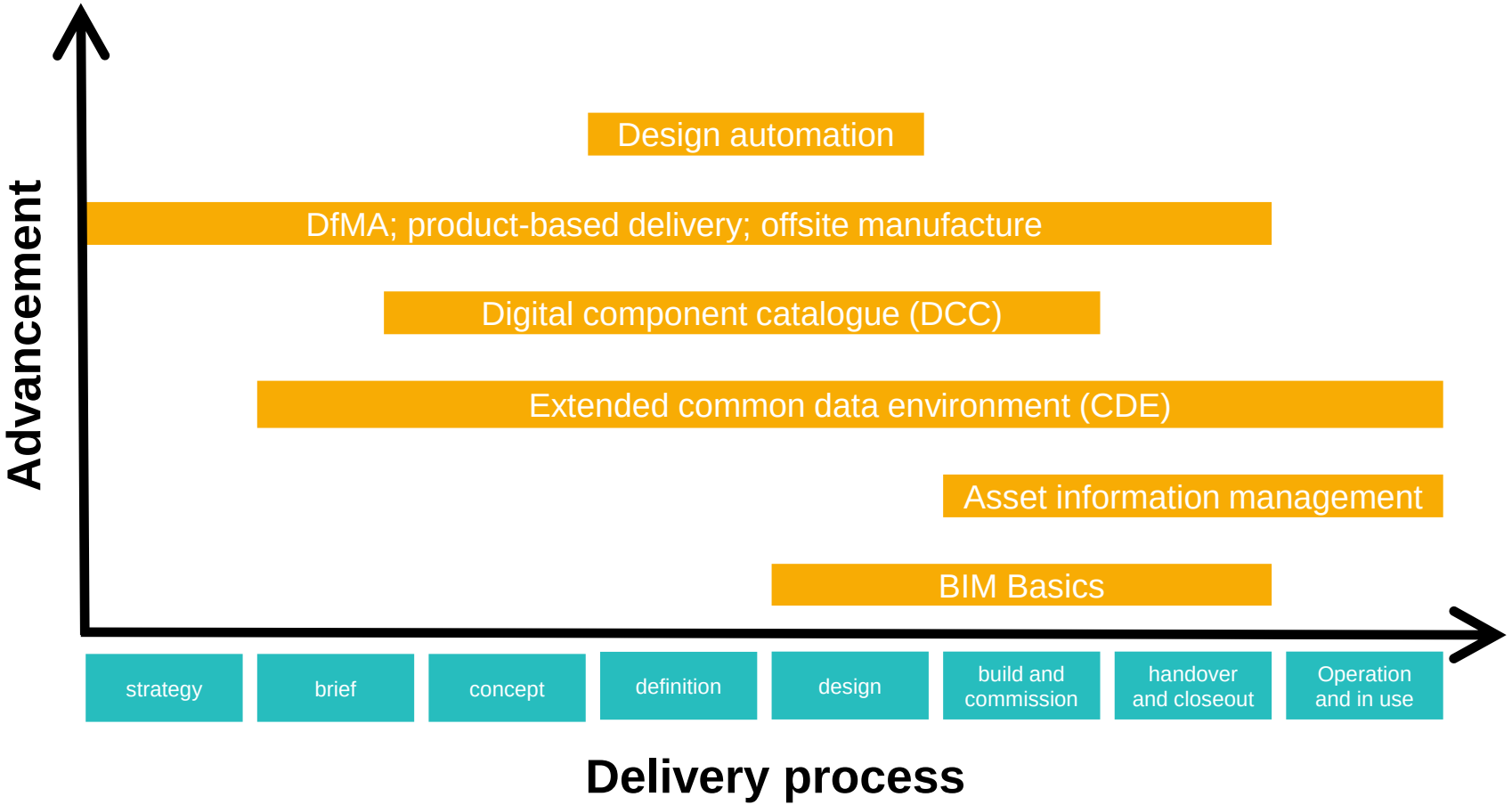
Physical infrastructure **Smart infrastructure** **Digital twin**

Smart infrastructure – Information pyramid




H2KnowHow
PROJECTS
HELP
Logout
PROJECT
Safeswim
SCENARIO
Safeswim
DATE RANGE
12 Mar 2017 to 13 Mar 2017
LAYERS
ANIMATED RAIN RADAR
BEACH POINTS
WASTEWATER BASE GIS DATA
Transmission Network
Pipe
Built
Proposed
Out of Service
Auckland
Waimauku
Huapai
Riverhead
Whatipu Beach
Maraetai
Clevedon
AKL
Papakura
12/3/2017 12:39 pm
X1
Leaflet | Tangram

Digital delivery advancement – start with the basics



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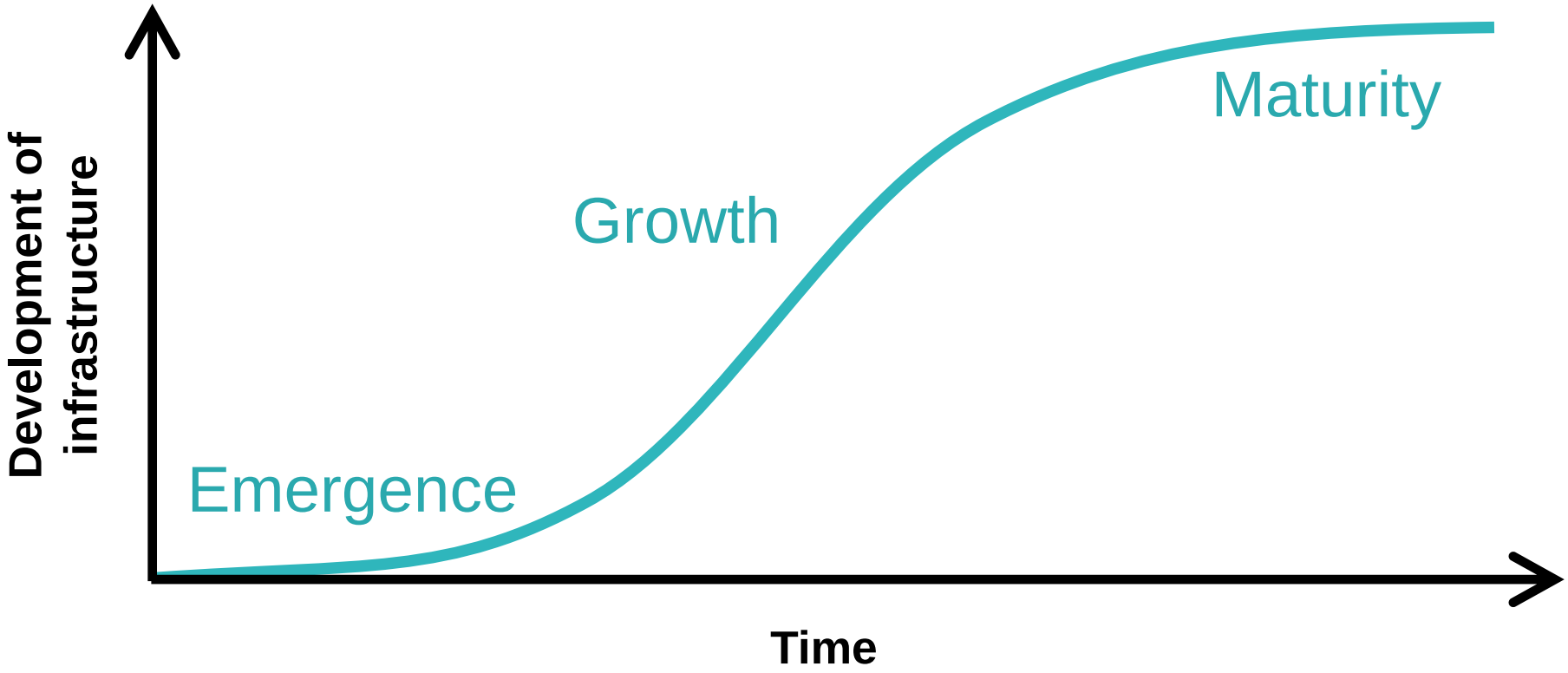
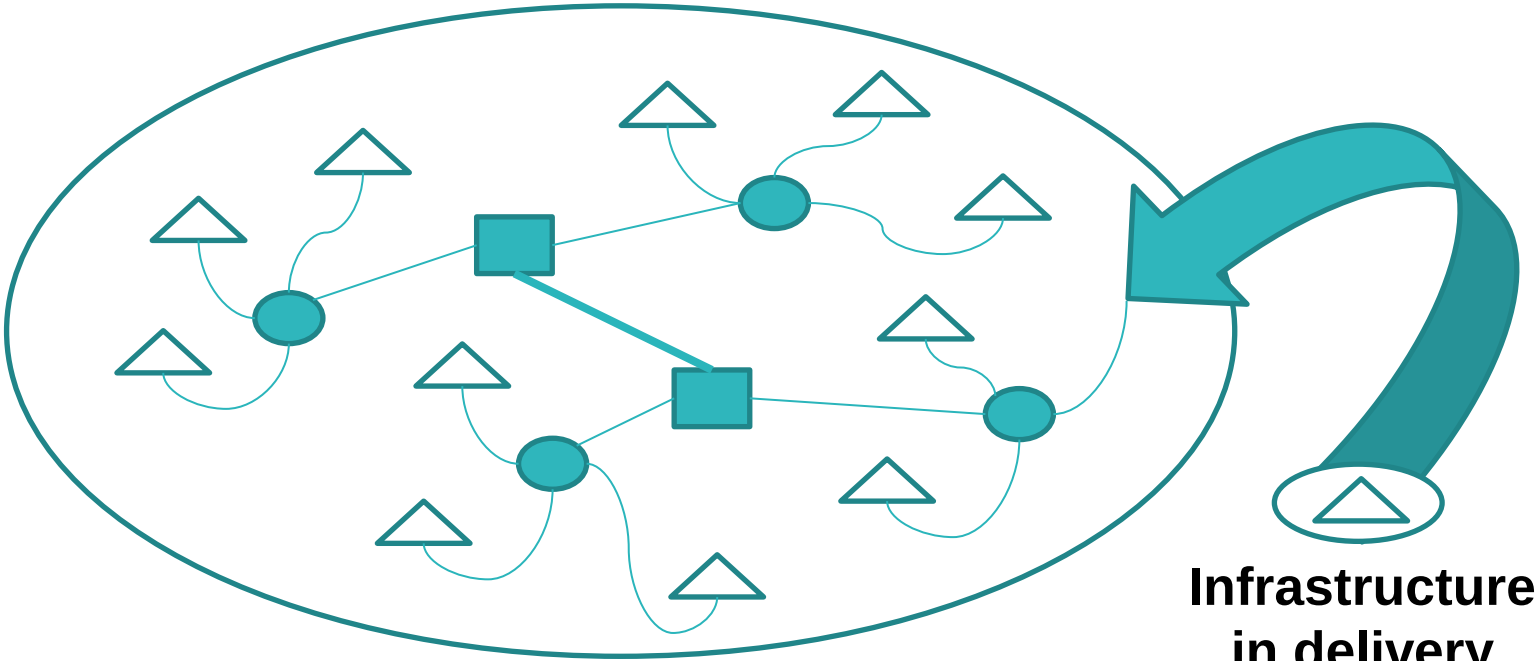
Transformation in: Procurement

Infrastructure maturity



Physical infrastructure



Infrastructure in delivery

Infrastructure in use

A shift in thinking in how and what we procure

From Growth	To Maturity
Focus on asset creation	Focus on asset management
Outputs for Clients	Outcomes for the ultimate customers
Construction industry	Infrastructure industry
Increase capacity via traditional constructed solutions	Increase capacity via innovative integrated digital/physical solutions
Green field – new build	Brown field – interface with existing assets
Reward outputs	Reward outcomes + efficiency
More hardware, less software	More software, less hardware

Re-thinking the definition of value

Outcome per

whole life $ for the

ultimate customers

A re-think required?

As Consultants our role is to add value to information…

…do current procurement methods work when time and value are not proportional?

Measuring Outcomes against multiple bottom lines

5 Capitals

1
Natural Capital

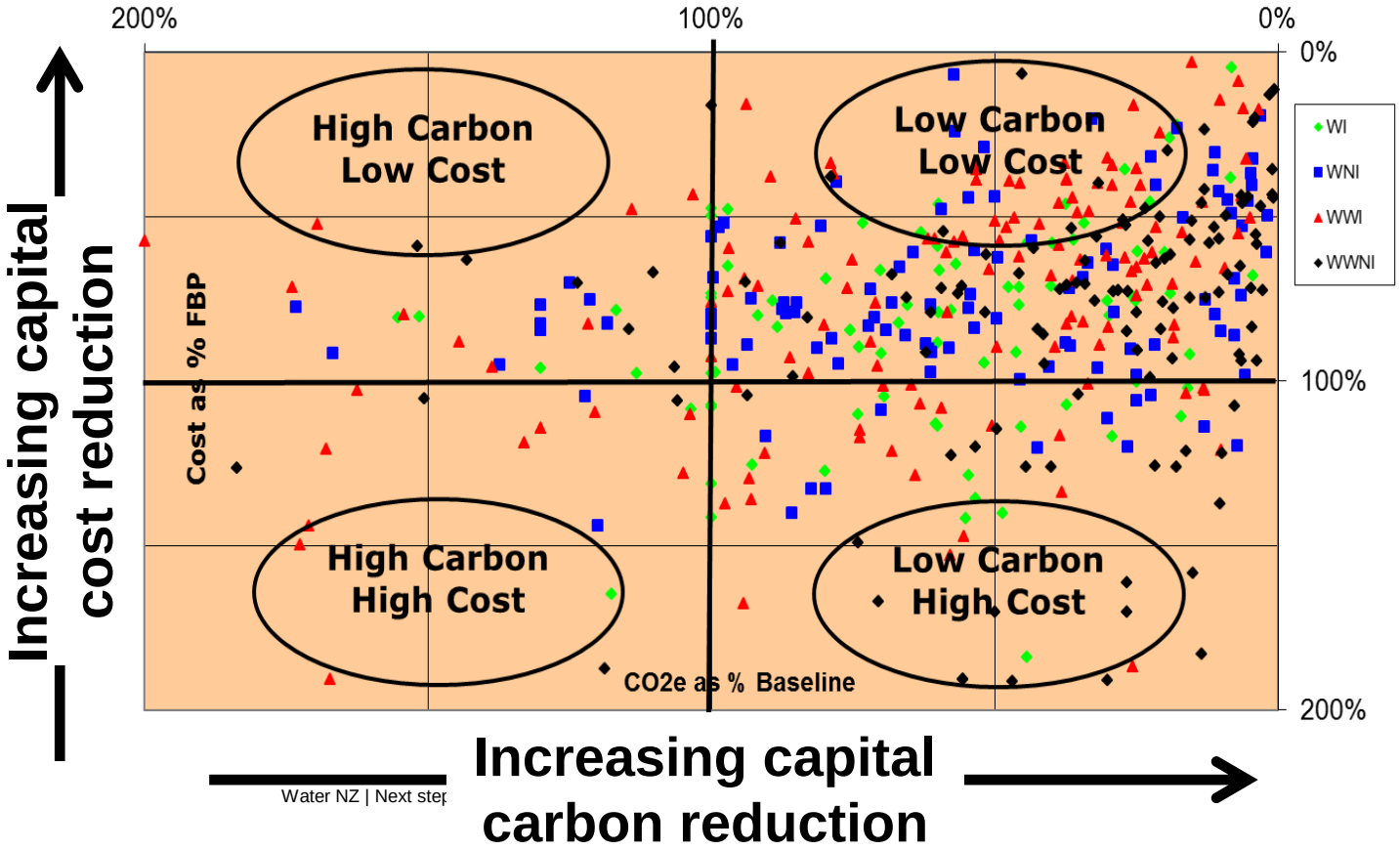
3
Social Capital

5
Financial Capital

2
Human Capital

4
Manufactured Capital

Incentivise delivery of the desired Outcomes



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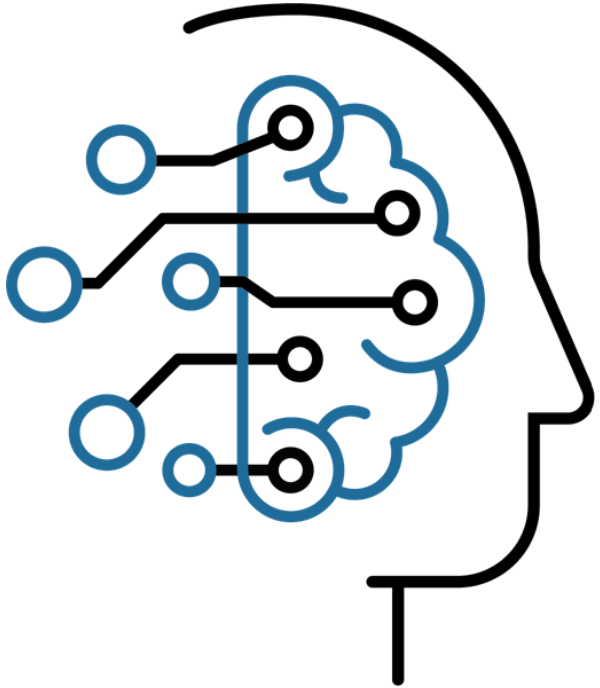
Transformation in: Skills and Mindsets

Transformation in Skills and Mindsets

Digital skills by default



A change in Mindset is required

The Switch

A Mindset for Change is required

Transformation in three core areas

Information

Let's get the house in order first with the **BIM Basics** to embrace **Smart Infrastructure** and **Digital Design**

Understand the **Value** of **Information**

Procurement

Ways of delivering **best outcomes** to the **ultimate customer** for **least whole-life dollar**

Skills and Mindsets

A **Change** in **Mindset** and a **Mindset** for **Change**

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Thank you