HM Government
Construction

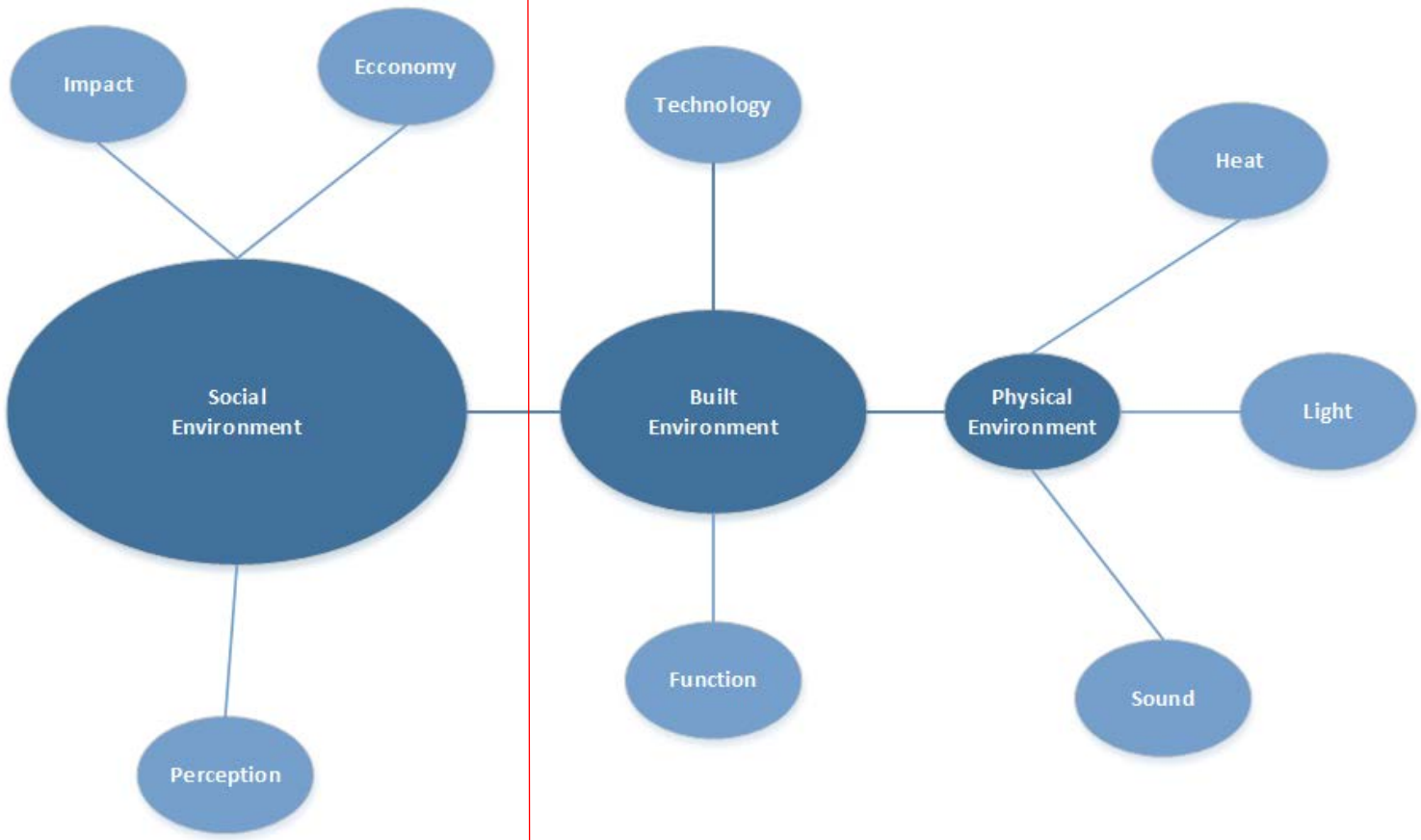
Moving from Productivity to Social Outcomes

The Journey from Level 3 to 4

Dr Mark Bew MBE

Digital Built Britain

Introduction

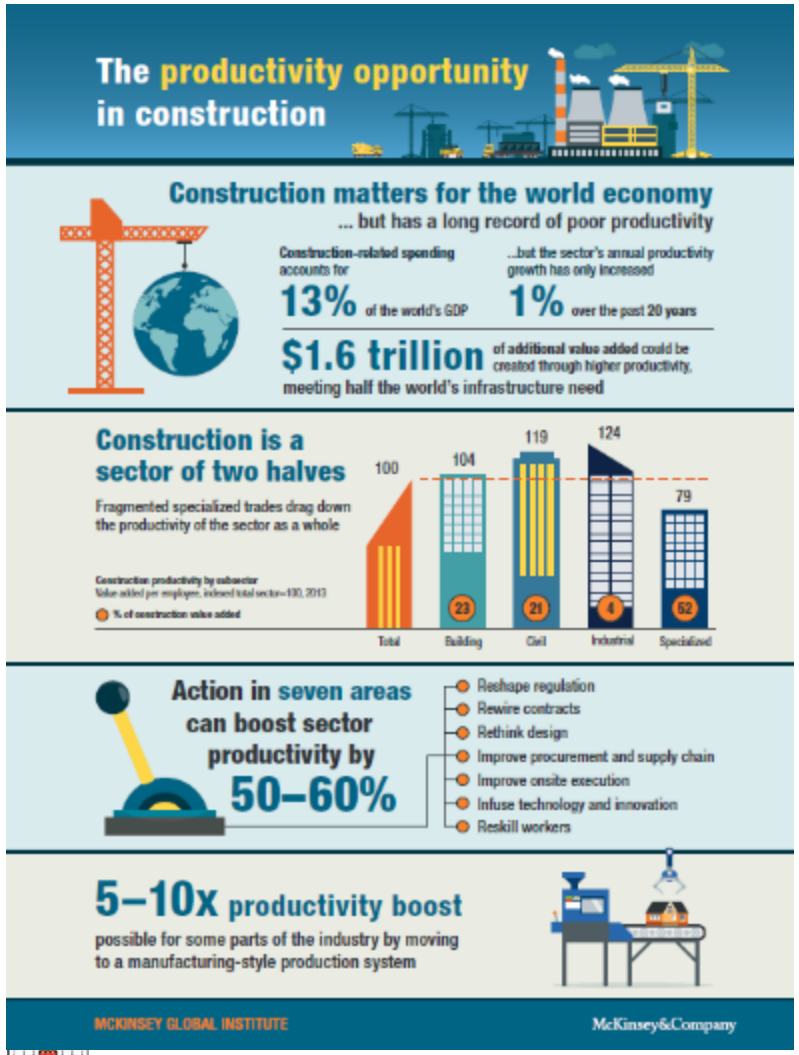


University of Salford MANCHESTER

HM Government Construction

Digital Built Britain

Introduction



Lower costs

33%

reduction in the initial cost of construction and the whole life cost of built assets

Faster delivery

50%

reduction in the overall time, from inception to completion, for newbuild and refurbished assets

Lower emissions

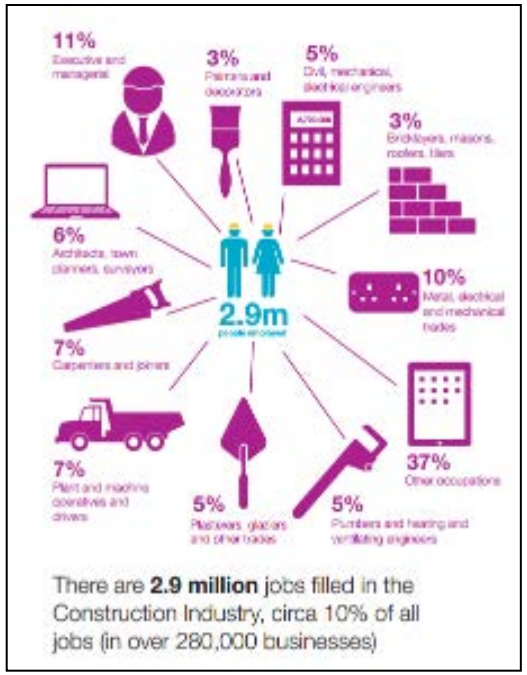
50%

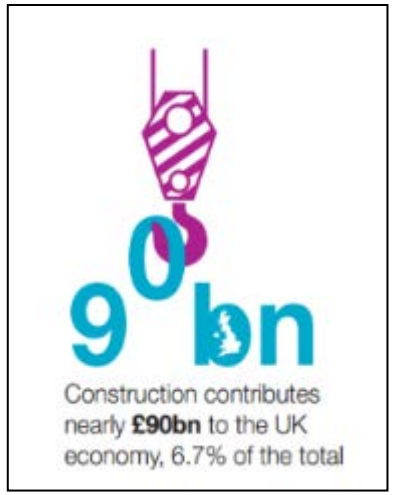
reduction in greenhouse gas emissions in the built environment

Improvement in exports

50%

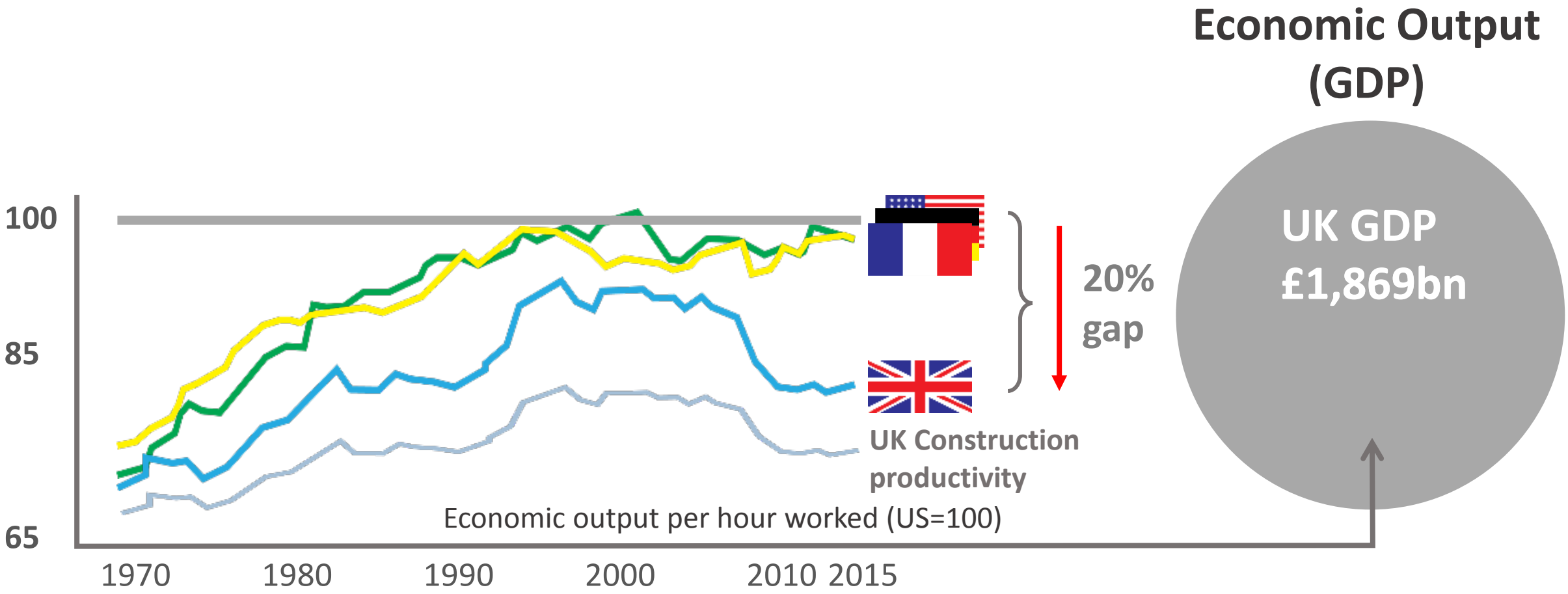
reduction in the trade gap between total exports and total imports for construction products and materials





Digital Built Britain

Introduction

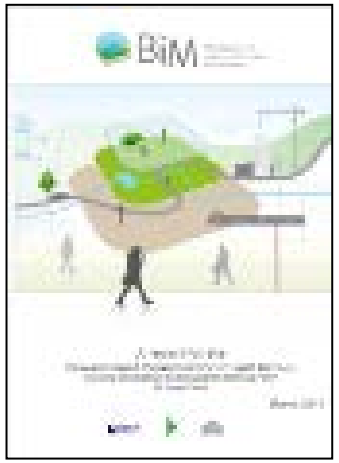


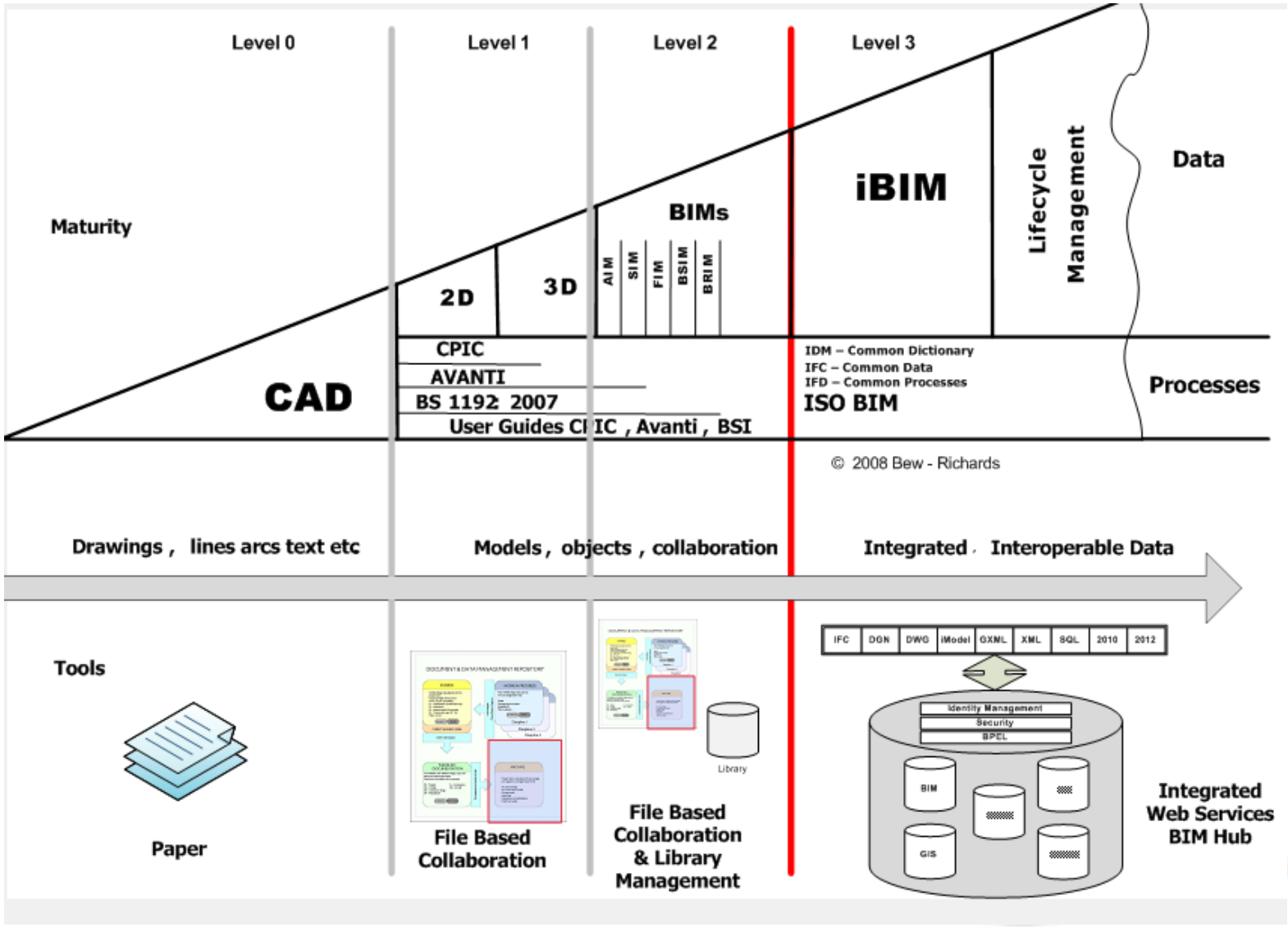
Digital Built Britain

Source: Building Our Industrial Strategy Green Paper

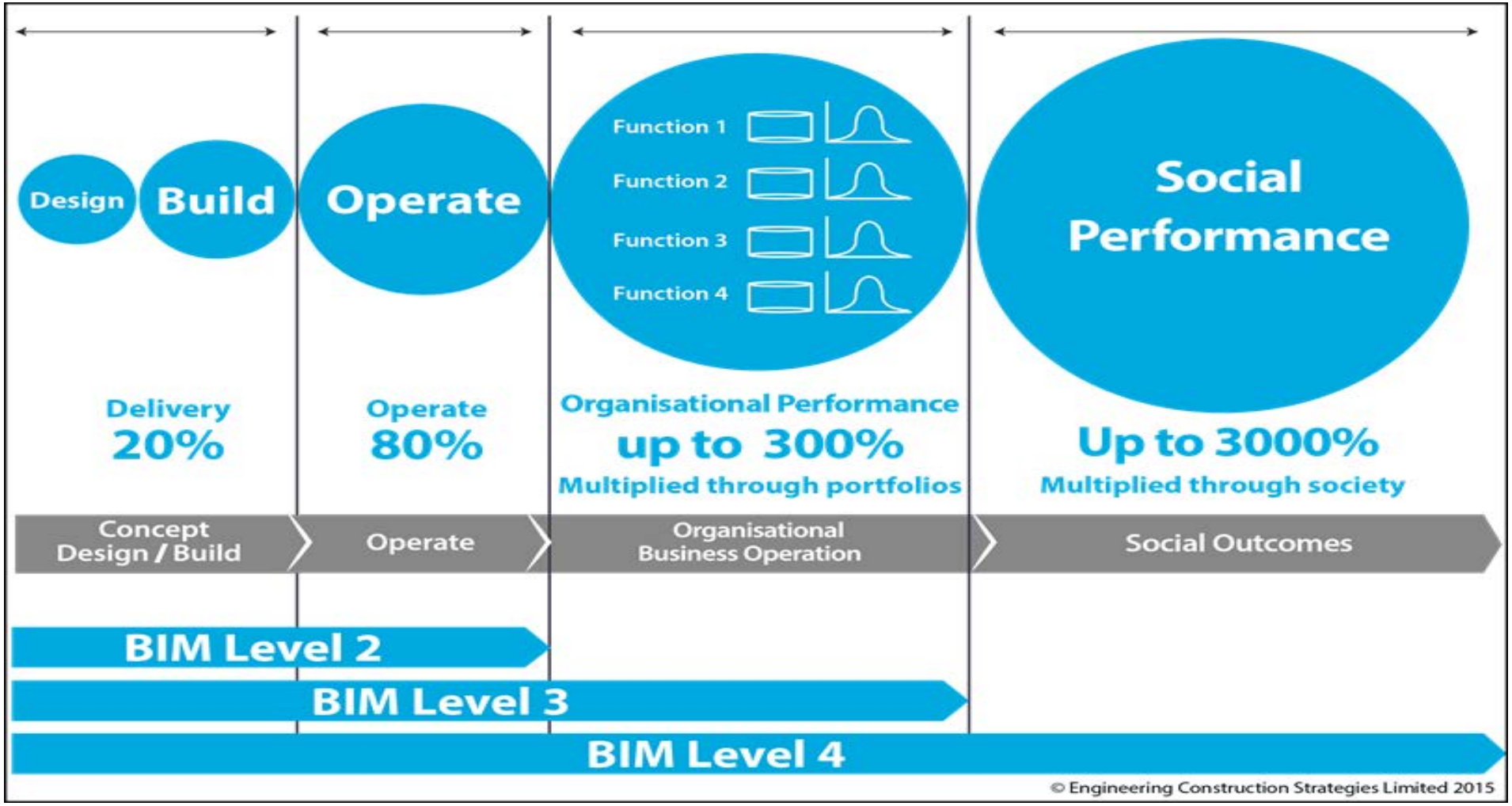
What is BIM?

Government
Construction
Strategy


BIM


Level 0
Level 1
Level 2
Level 3
Maturity
CAD
2D
3D
BIMs
AIM
SIM
FIM
BSIM
BRIM
iBIM
Lifecycle Management
Data
Processes
CPIC
AVANTI
BS 1192 2007
User Guides CPIC , Avanti , BSI
IDM – Common Dictionary
IFC – Common Data
IFD – Common Processes
ISO BIM
© 2008 Bew - Richards
Drawings , lines arcs text etc
Models , objects , collaboration
Integrated . Interoperable Data
Tools
Paper
File Based Collaboration
File Based Collaboration & Library Management
Library
IFC
DGN
DWG
iModel
GXML
XML
SQL
2010
2012
Identity Management
Security
BPEL
BIM
GIS
Integrated Web Services BIM Hub

BIM & (Smart) Cities - Value



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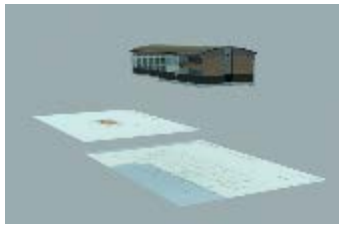
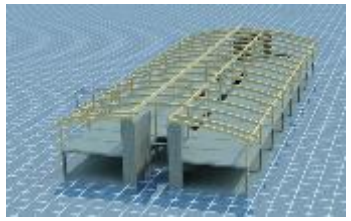
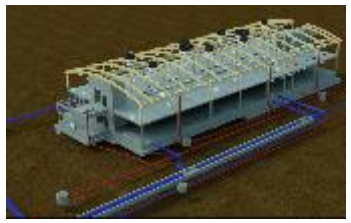
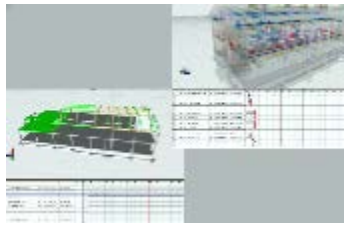
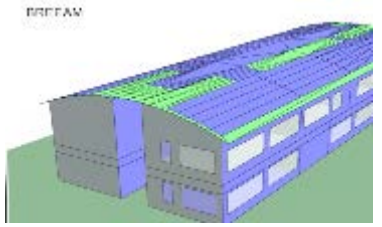
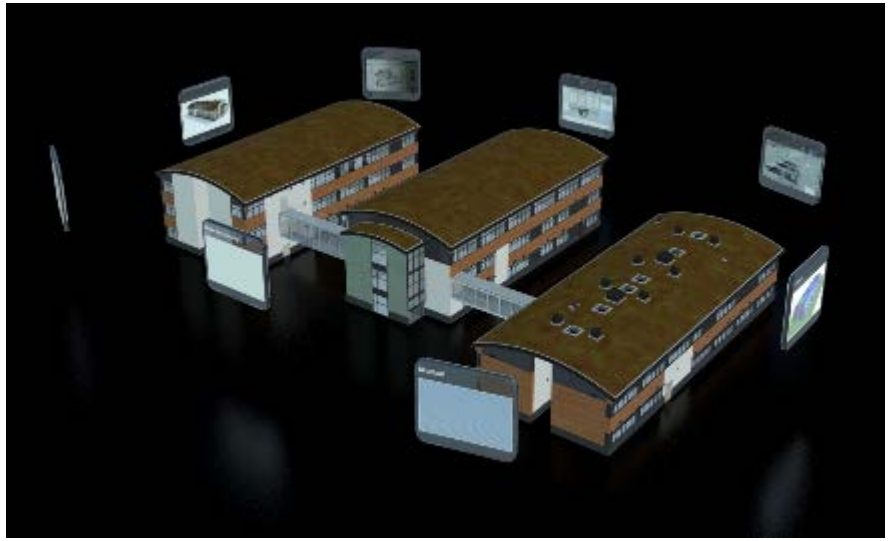
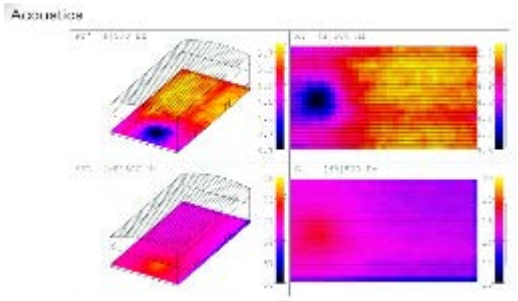
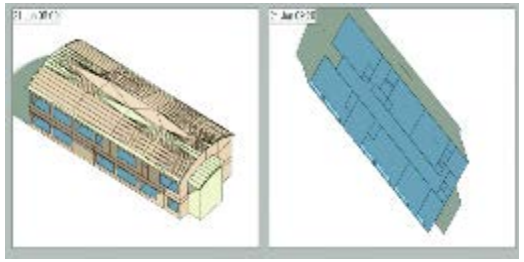
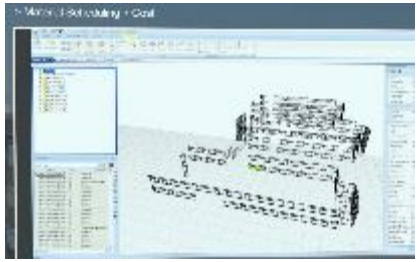
What is Level 2 BIM?









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Level 2 City “Package”

Department for Culture Media & Sport

PAS 180 - Vocabulary

PAS 181 – SC Concept Model – Guide to establishing a model for data interoperability

PAS 182 - Smart city concept model

PAS 183 – Guide to establishing a decision framework for sharing data and information services

PAS 184 - (Smart Cities – Guide to developing project proposals for delivering smart city solutions)

PAS 185 – SC – Security Mindedness

PD 8100 – SC Overview – Guide

PD 8101 – SC Guide to the role of the Planning & Development Process

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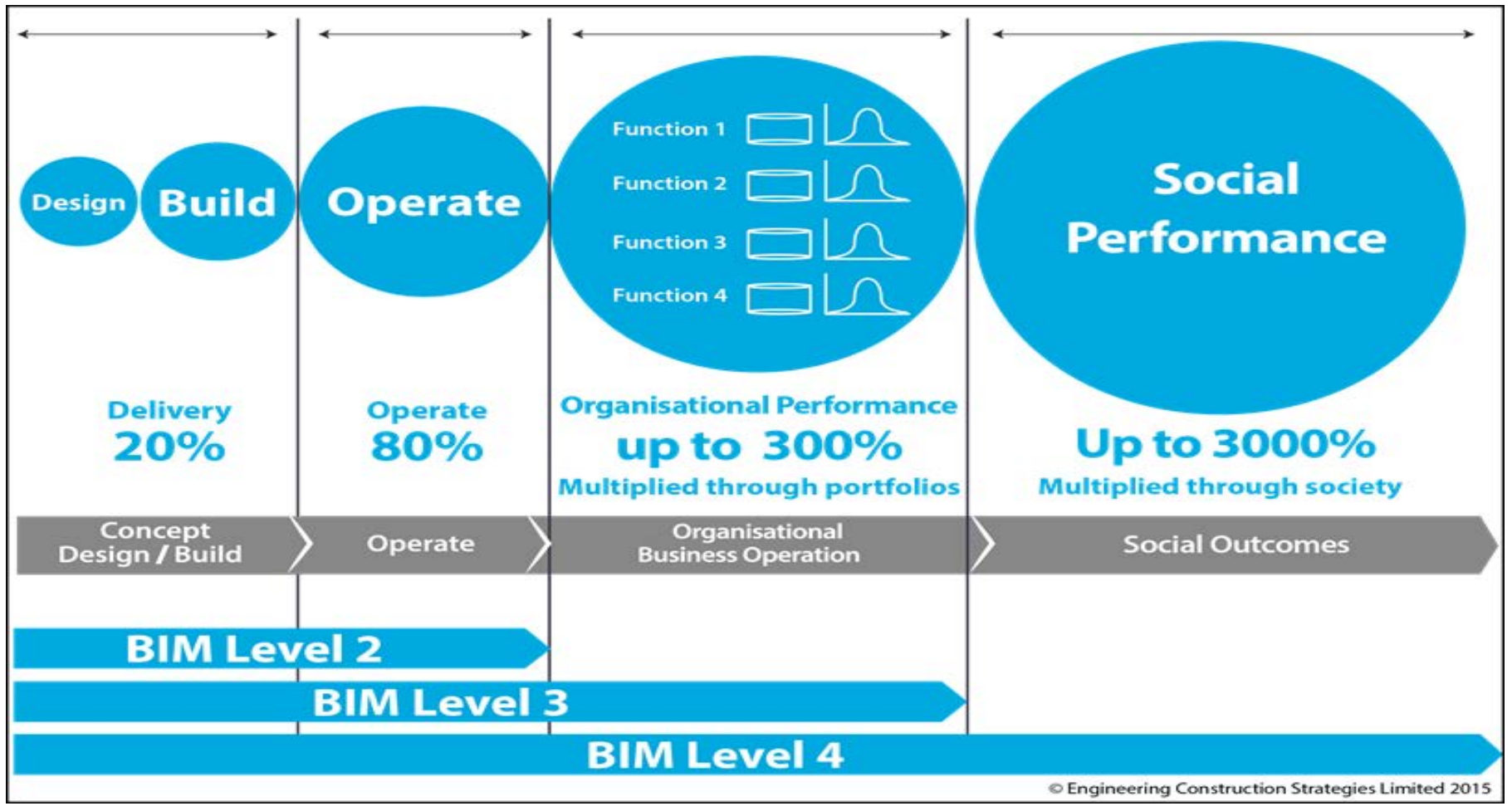
BIM & (Smart) Cities



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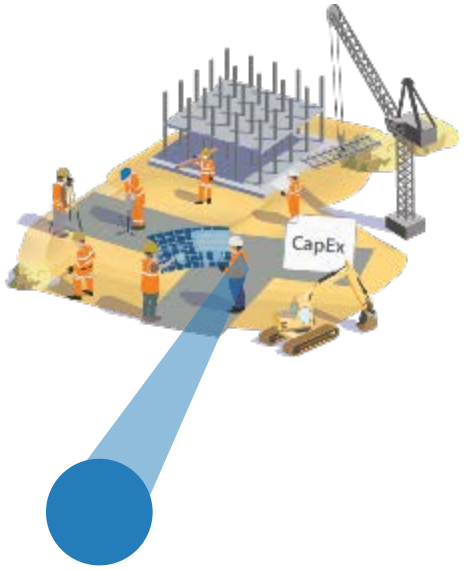
Where is the Value?

CapEx



£89bn

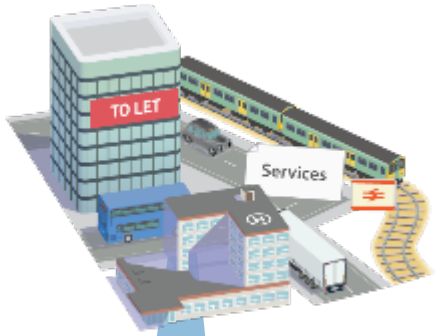
Construction Sector

OpEx

£122bn

Infrastructure and Facilities Management

Service Provision



£360bn

Economic contribution of services predicated on the built environment (e.g. transport, healthcare, etc.)

£571bn

Improved construction output leads to improved operations

Improved construction output leads to optimised business services

Digital Built Britain

Sources: ONS, gov.uk, Gazprom, Facilities Management Journal, Arcadis

Level 3 - Vision

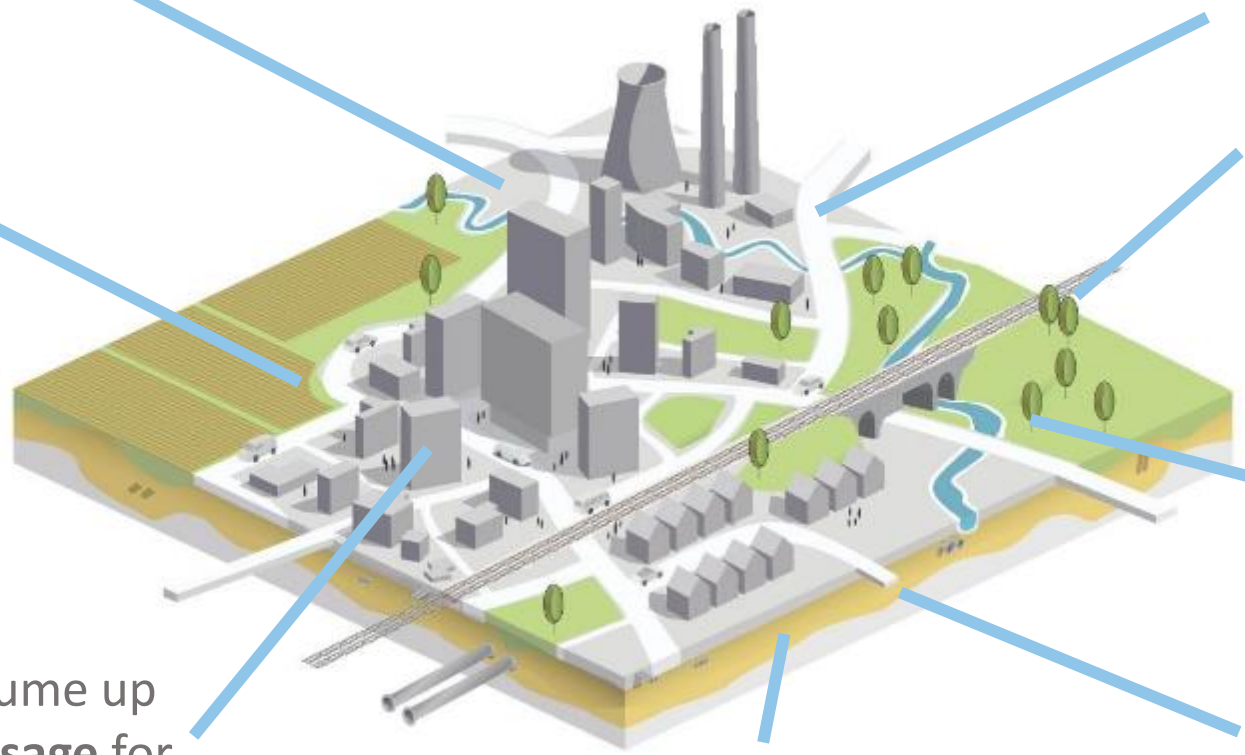
The exploitation of data will enhance natural and built environment services, driving up citizen quality of life, well-being, commercial competitiveness and productivity

Constraints in Britain's built environment infrastructure are acting as a brake on economic growth

Delays in strategic financial **decisions** increase project costs by est. 100%

Traffic congestion costs the UK economy £13.1bn in 2013

20% of total construction costs is **re-work**



Train delays in Scotland cost the economy £85 million in 2015/16

It costs the NHS **£600m pa** to treat illnesses caused by living in poor housing conditions in England

Homes and offices consume up to 4x designed **energy usage** for same output

Transport and Energy supply contribute to more than 50% to UK's total greenhouse gas emissions

Disruption from **flooding** costs the UK economy £1bn pa

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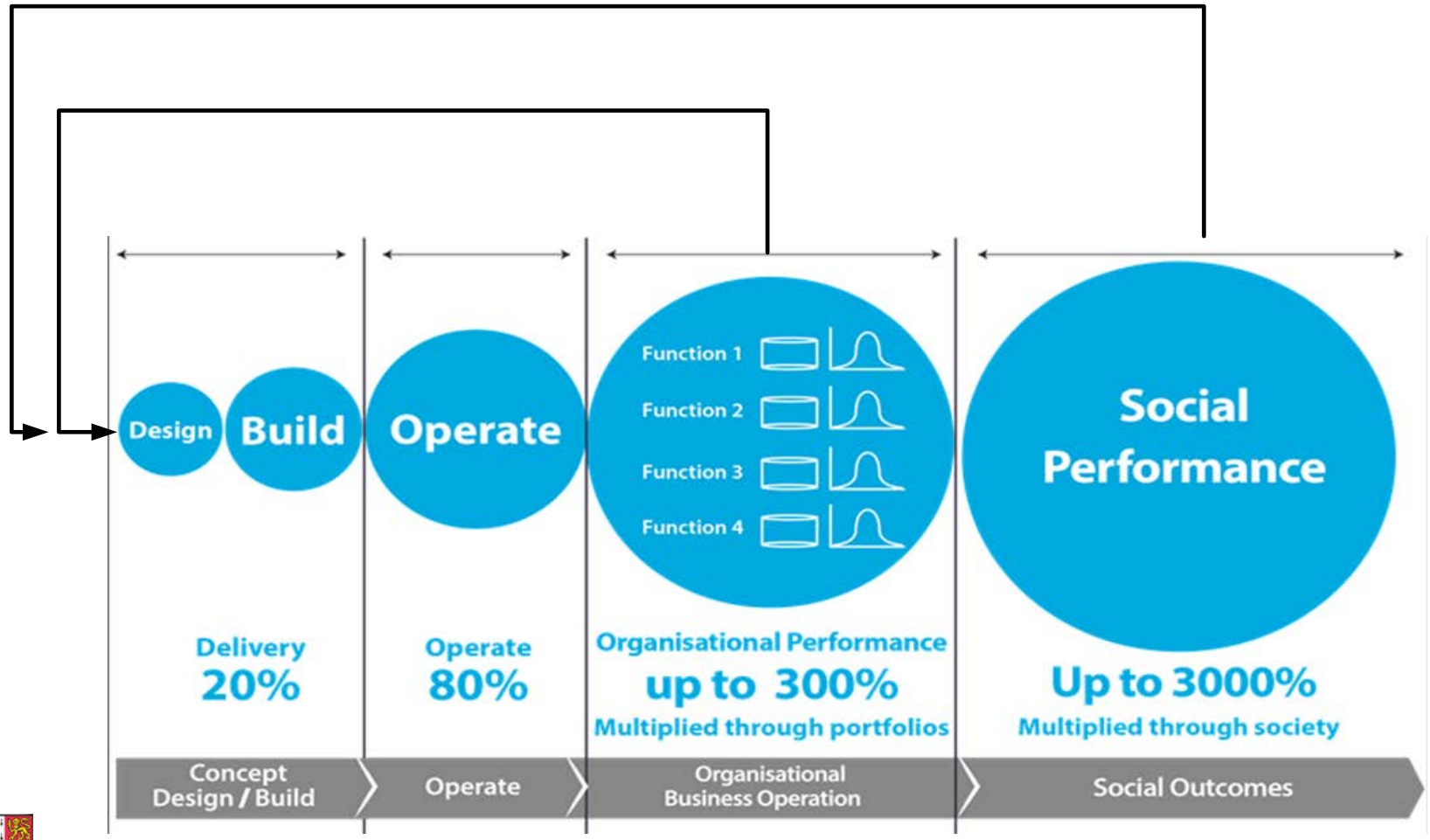
Level 3 – Functional Improvement



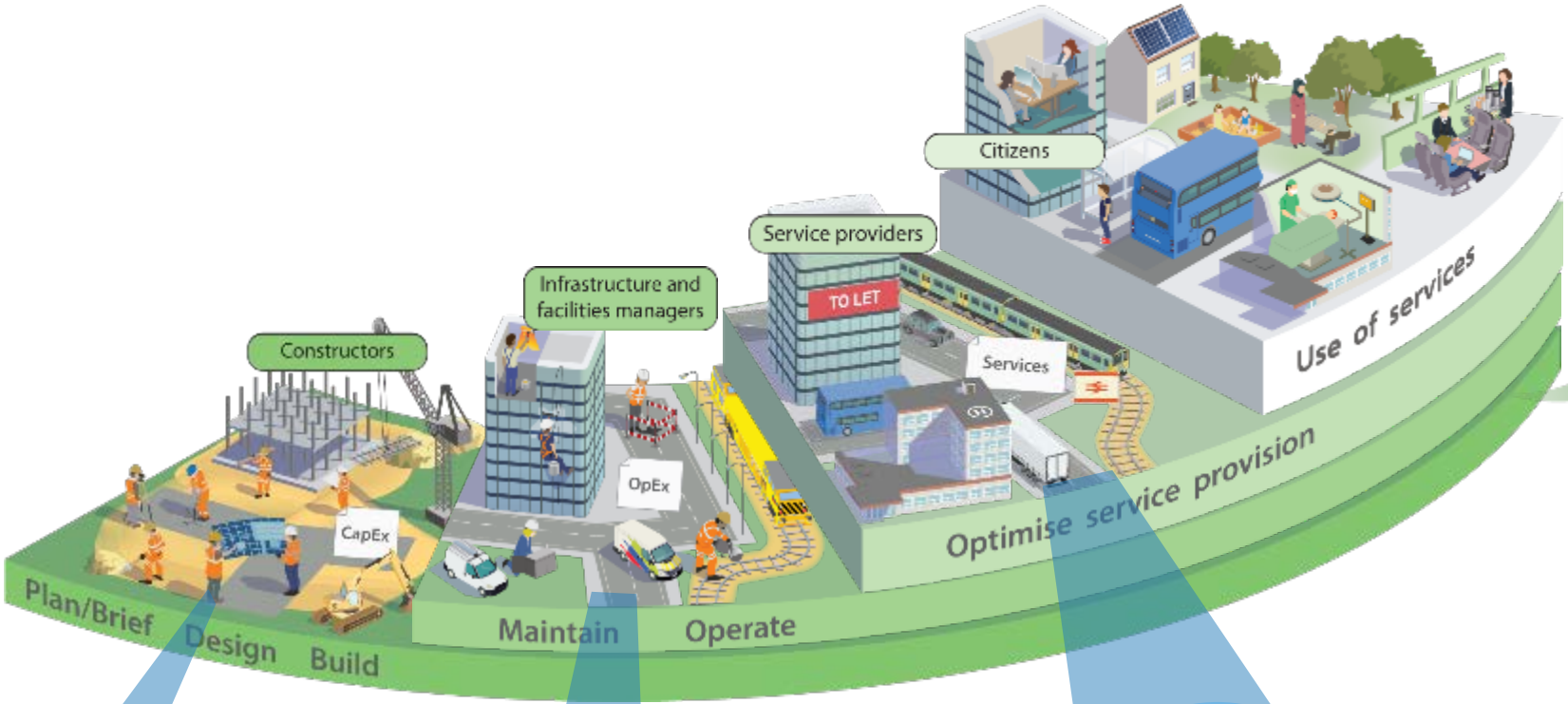
Demands of Customers

Buildings and Communities

Feedback & Systematic Learning

Digital Built Britain

Analysis shows whole-life benefits could be as much as 1-2.7% of GDP



£89bn
(15% - 25%)

£122bn
(10% - 20%)

£360bn
(10% - 15%)

1-2.7% increase in GDP

£1,869bn
(£19bn - £52bn)

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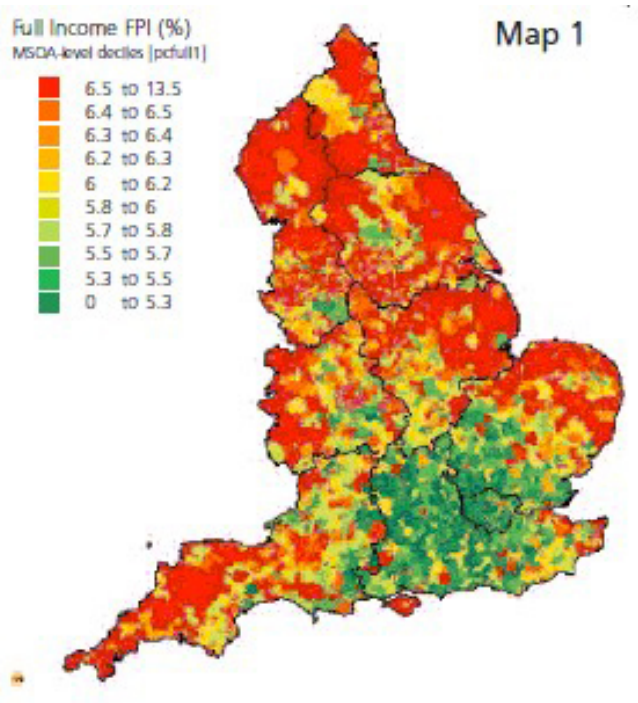
Level 4 – Hypothesis (Potential Vision)

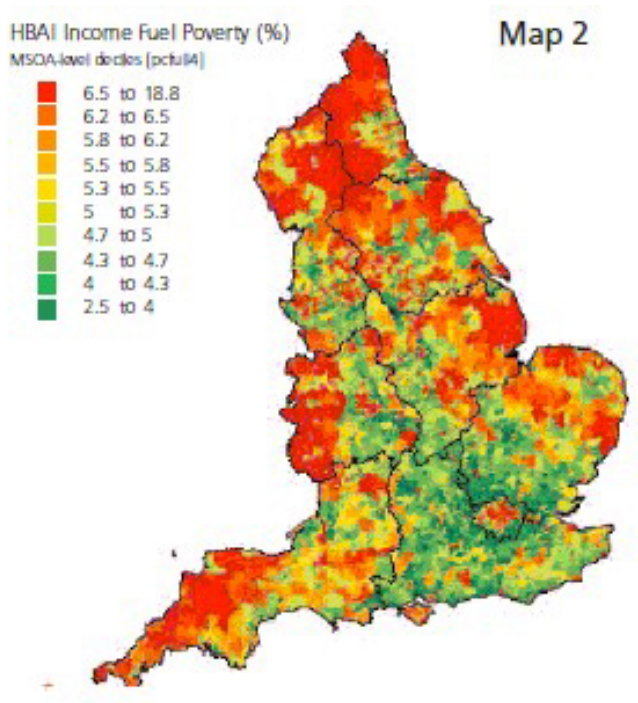
“Better perceived social outcomes that can improve the lives and wellbeing of people can be successfully engineered through effective requirements management and integrated data processing.”

Social Outcomes

Measurement Strategy

- Income/GDP (Level 3)
- Environment Related (Level 3)
- Perception (Level 4/n)





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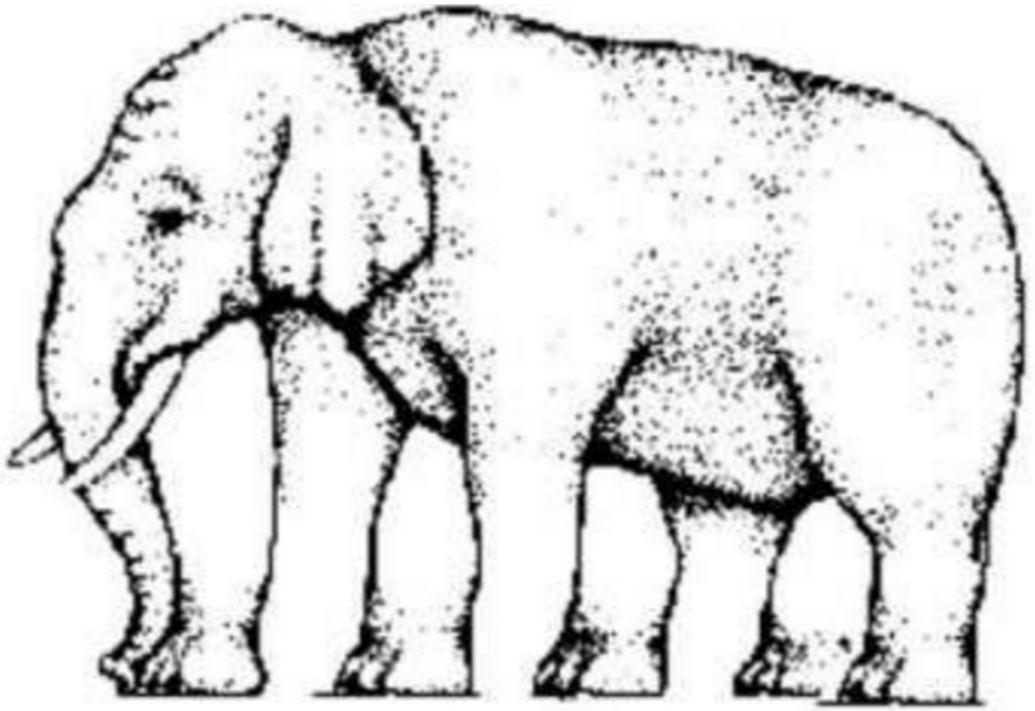
Social Outcomes & Perception

Social Outcomes & Perception



How many legs does this elephant have?

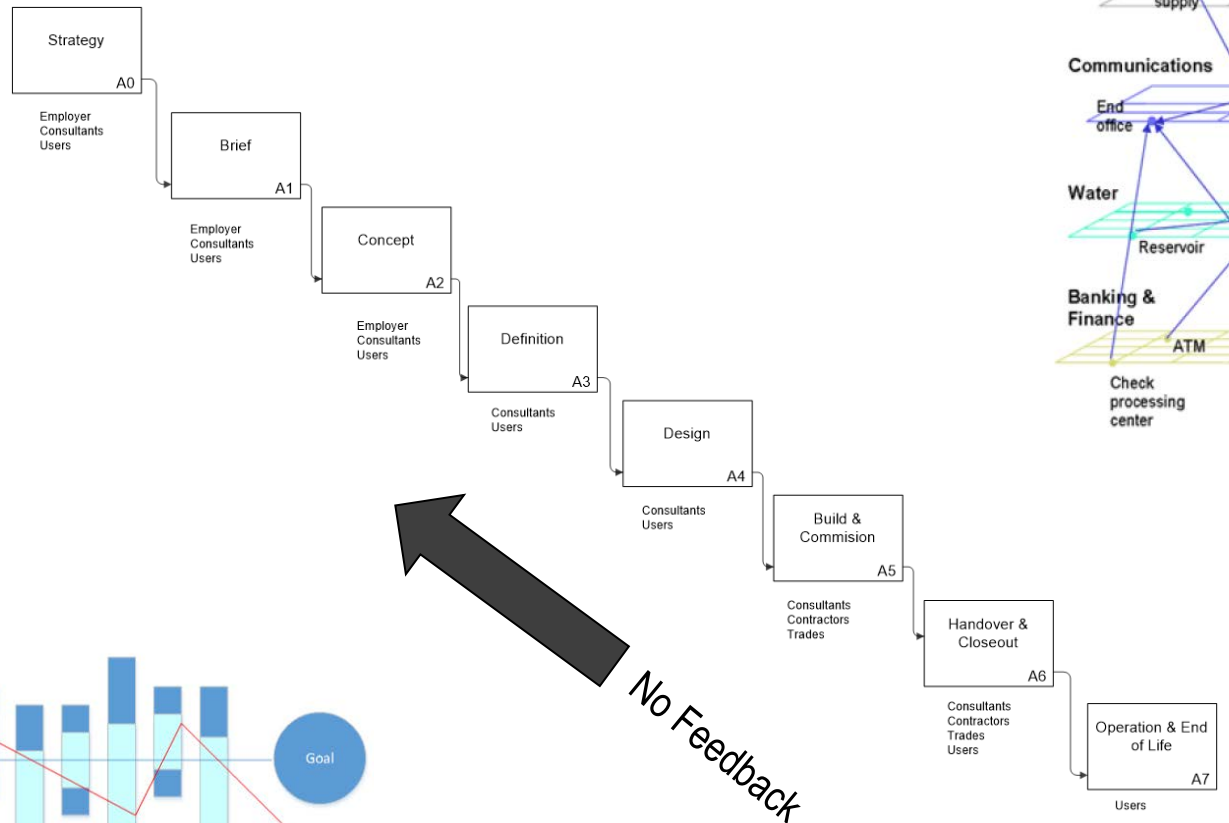
Digital Built Britain

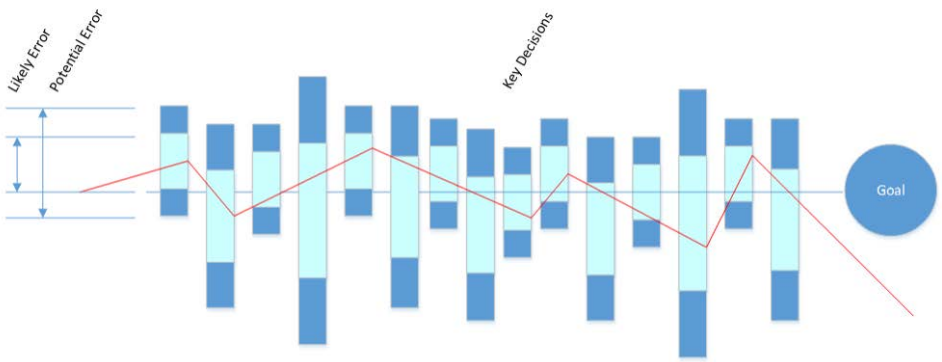
Research Introduction

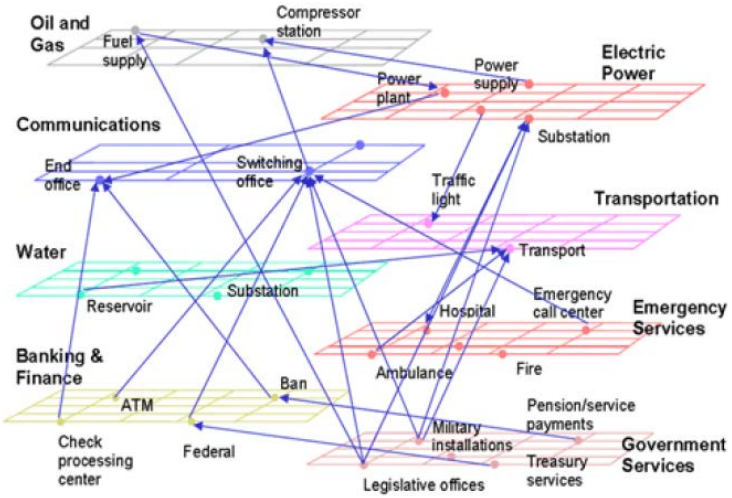
Objectives

- To establish the nature and structure of the data processed throughout the asset's lifecycle.
- To establish the availability, nature and characteristics of human perception and methods for collecting data to record the perceptions.
- To examine the nature and relationships between social community perceptions and built asset physical performance.
- To determine if a systematic approach can be used to create a relationship between asset data and perceptive performance.
- To determine if the outputs of such an approach can be presented in a manner that can improve existing performance and future briefing.

Current Practice for Asset Delivery and Operations







Emerging Measurement Capability

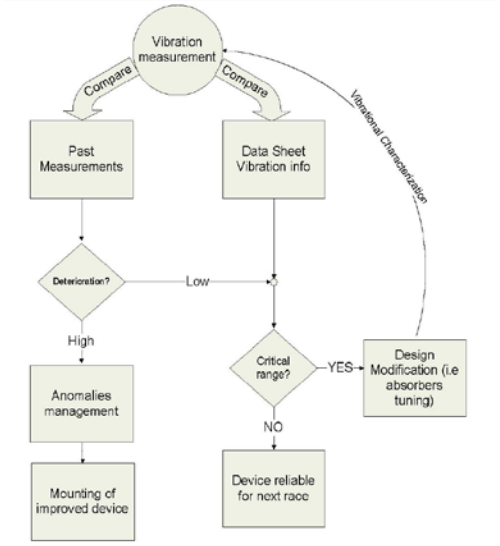
Feedback & Learning

Learning may be defined as the detection and correction of error

Chris Argyris (1978)

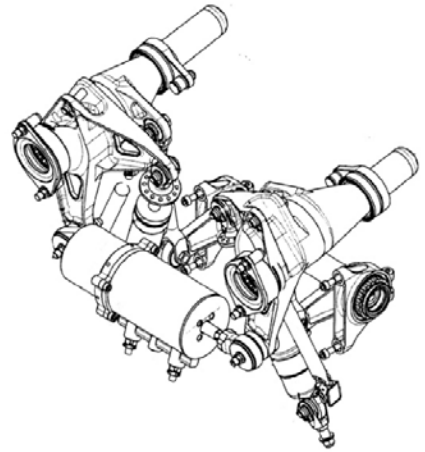
Single Loop

Single-Loop learning occurs when errors are corrected without altering the underlying governing values

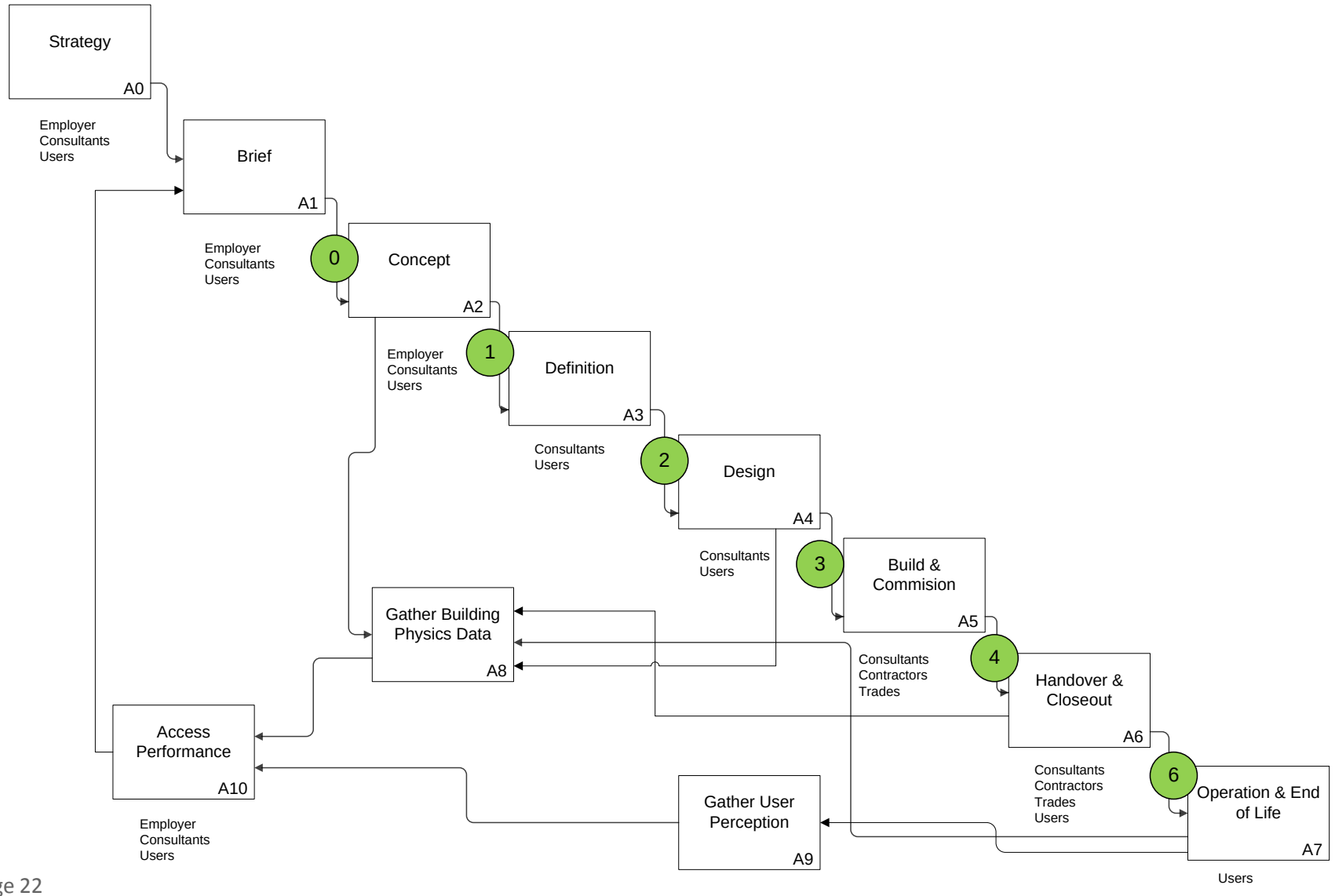


Double Loop

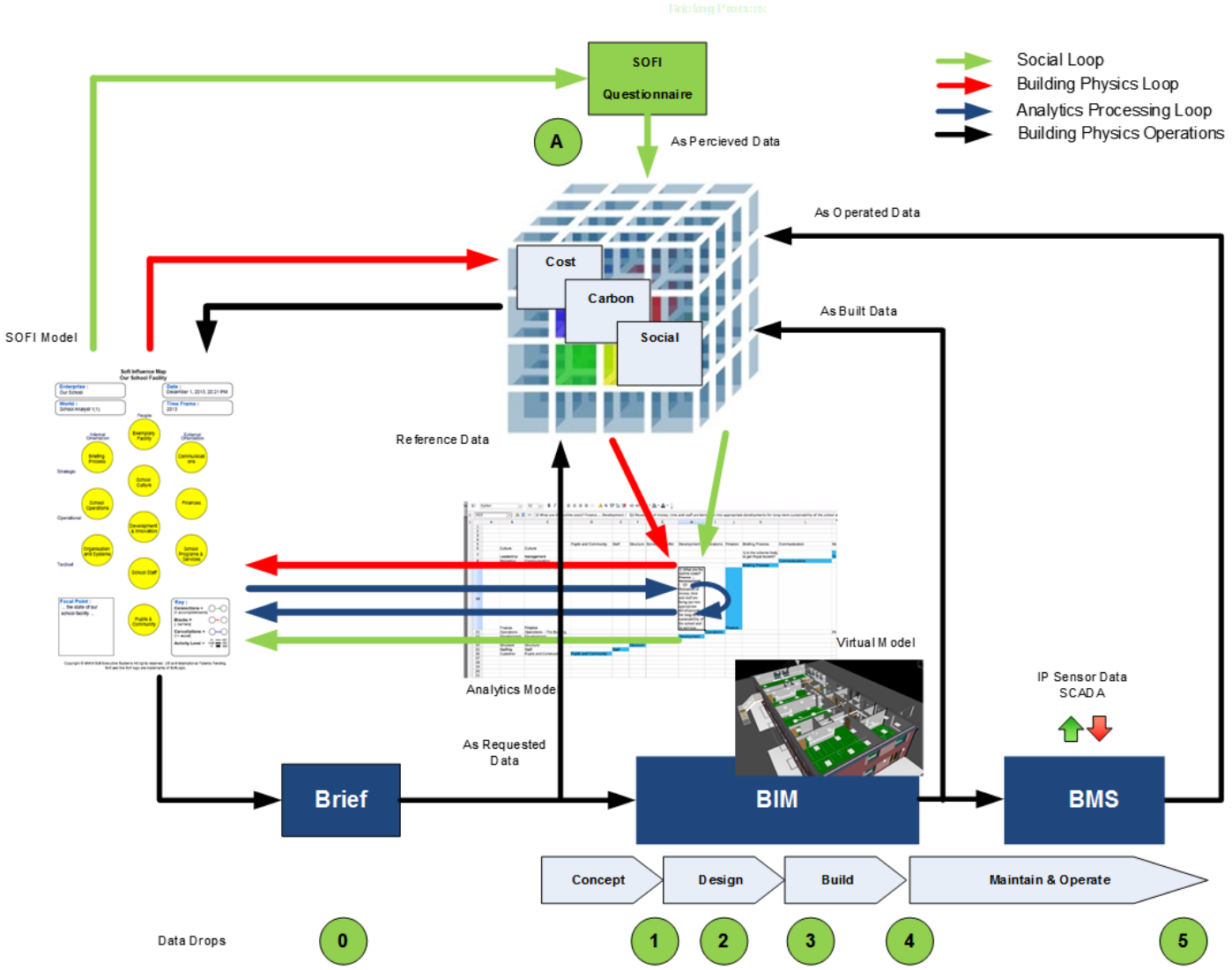
Double-loop learning occurs when errors are corrected by changing the governing values



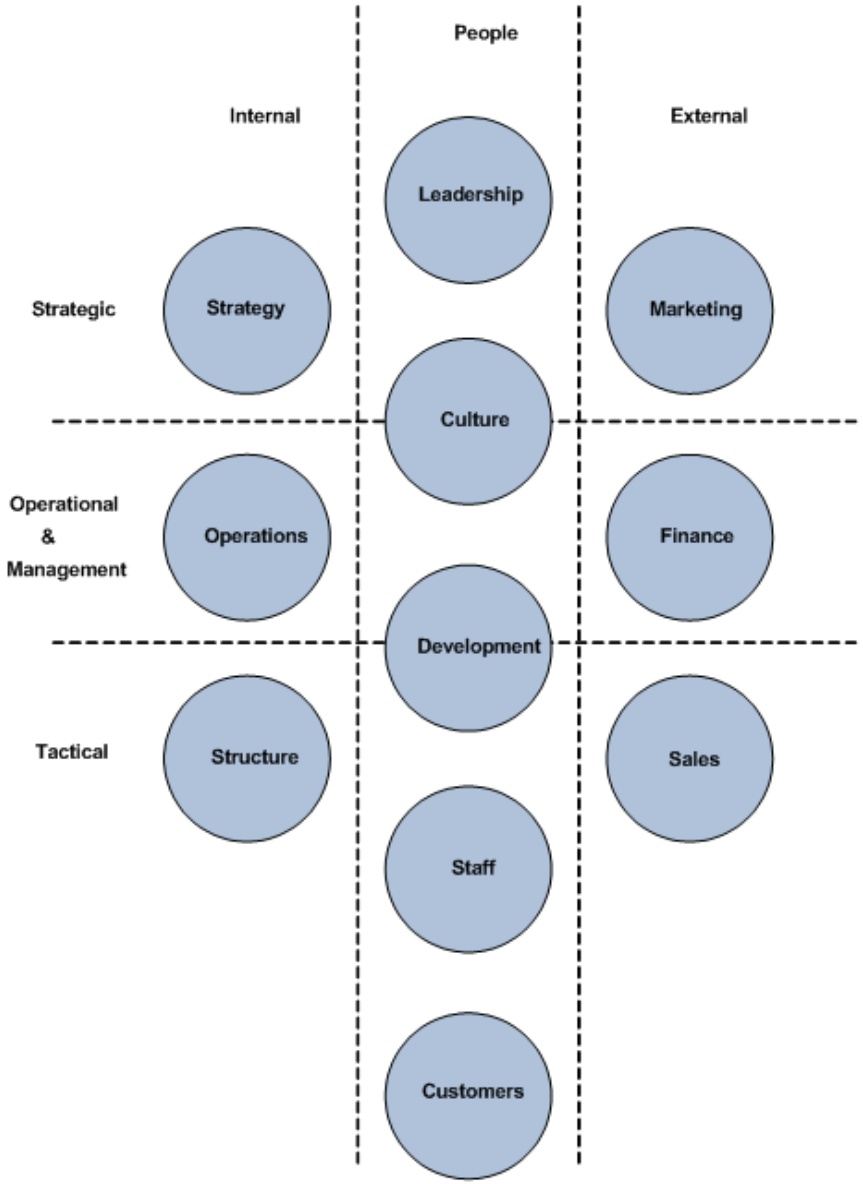
Delivery & Feedback



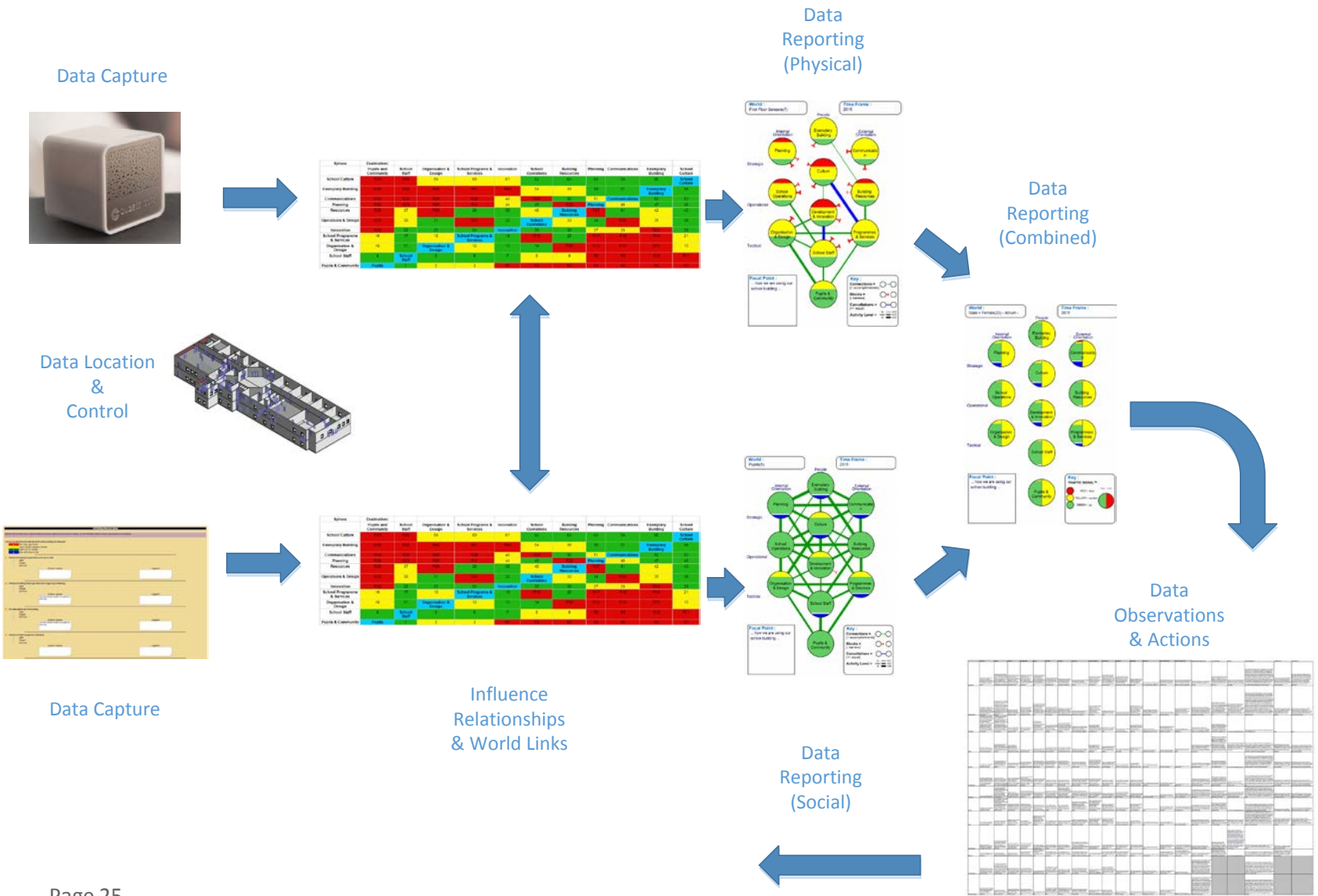
Development of Methods & Tools



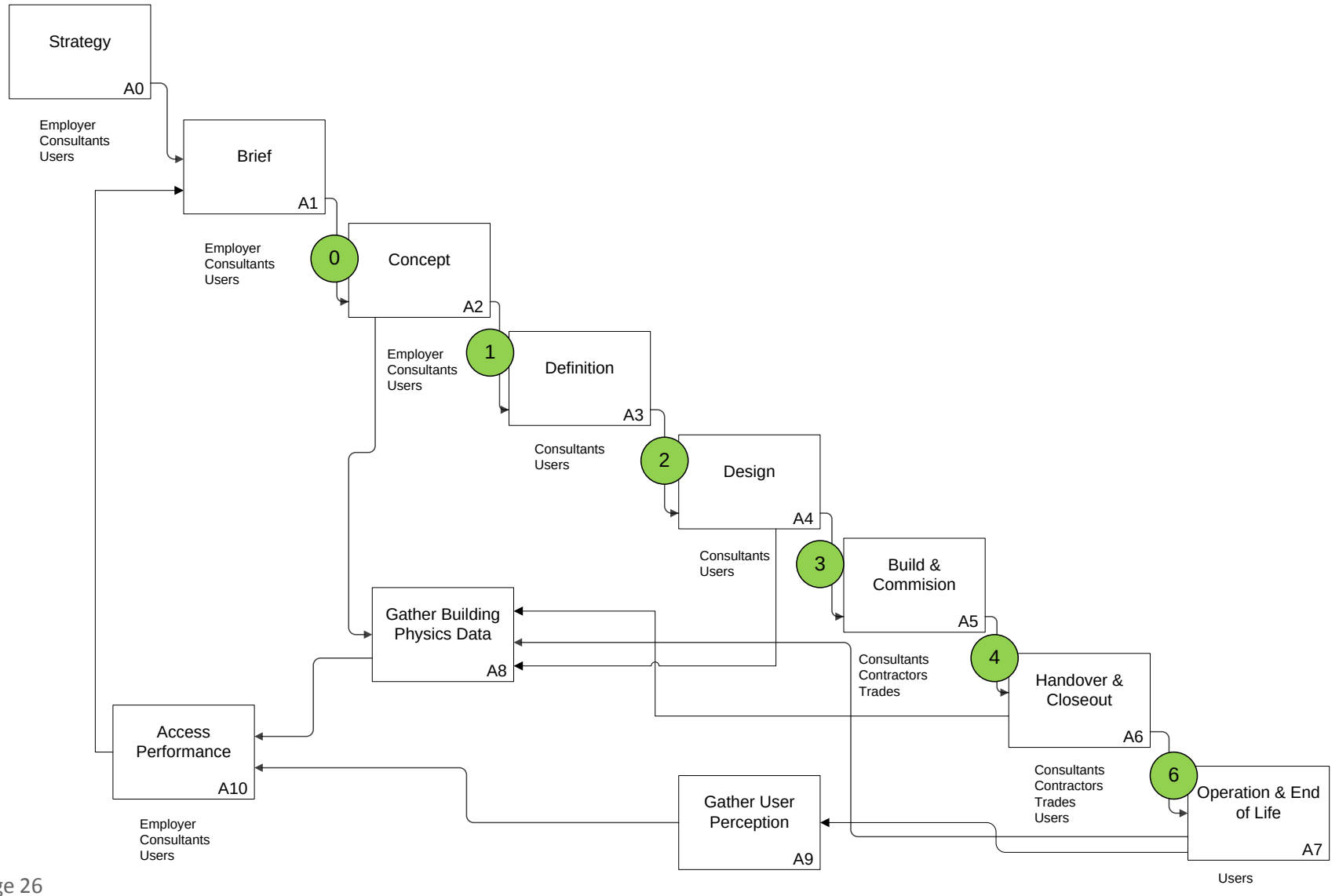
Spheres of Influence – SOFI



Integration & Reporting



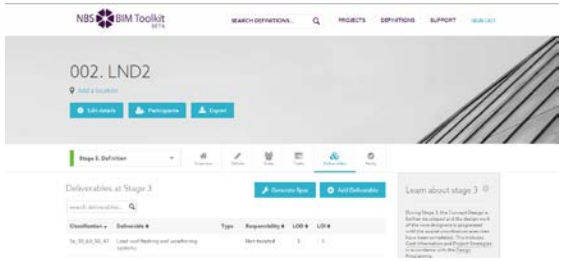
Delivery & Feedback

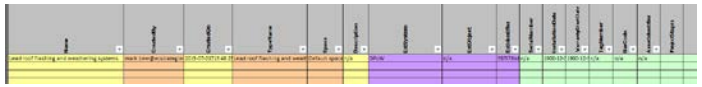


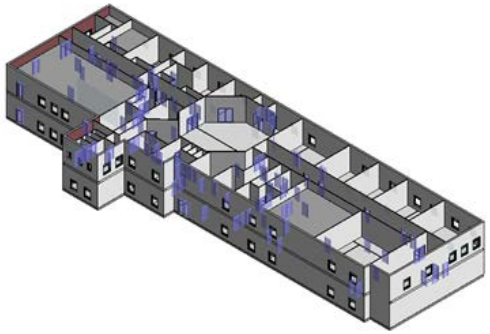
Briefing & Specification

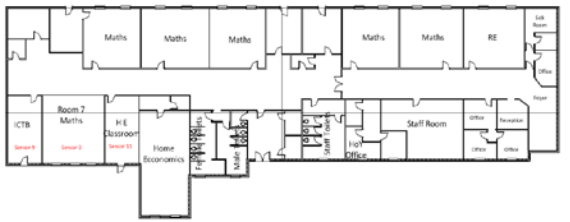
	Project Room Data Sheets	
Project Name	LND	
Room Name	Group Rooms - Generic	
Room Ref		Version
Number of Rooms		Floor
Sizes of Rooms		
Room Occupancy		
	Architectural Services	
Ceilings	Either suspended or painted plasterboard. (Above ceiling void easily accessible for future maintenance and adaptation to services, moisture resistant.)	
Walls	Paint or other easily cleanable finish. Should be easily re-paintable.	
Floors	Combination of anti-static carpet and non-slip vinyl (or equivalent) surface	
Joinery	Timber or equivalent; skirtings, architraves and windowboards. (painted finish).	
Fittings	1 x standard double cupboard sink unit including stainless steel single drainer and separate hot and cold taps. Units to be high quality standard kitchen units. Selection of cupboard front to be agreed from range selected with the school, with robust cupboard hinges.	
Fixtures	blinds to all external windows	
Windows	Double glazed, solar reflective, lockable. Restricted Openings (Maximum windows to obtain maximum natural light)	
Doors	Internal flush faced, solid, top and bottom anti shatter vision panels, finger guards, lockable door. External doors predominantly anti shatter glazed, threshold with level transition from inside to out, lockable and openable from the inside without a	
Ironmongery	3 No. hinges, push plate, pull handle, kick plate, metal ball latch, deadlock, escutcheons (no snib). Keys to be on a mini master key system for whole block. Door closer. Vision Panel, Room sign holder system.	
Storerooms		
Whiteboards	yes, supplied by client	
Pin Boards	5 Pinboards - 1200 mm x 900 mm - locations to be selected by School	
Notes	Client / End User to order loose furniture	
	Mechanical Services	
Temperature Summer (Min)	19	
Temperature Summer (Max)	21	
Temperature Winter (Min)	19	
Temperature Winter (Max)	21	
Ventilation VOC (Max)	1000	
Ventilation VOC (Min)	450	
Humidity (Max)	45	
Humidity (Min)	55	
Heating		
Noise Level (Max)	60	
Air Conditioning		
Water Services (Cold)		
Water Services (Hot)	Tepid water supply to sink unit	
Water Services (Drinking)	Drinking water supply to sink unit	
Special		
	Fire Protection	
Sprinkler	No, unless required by Building Control	
	Electrical	
Lighting (Luminaire Type)		
Type of Lamp		
Target Lux	300 lux min, limiting glare rating 19, minimum colour rendering 80 and uniformity ration 0.8	
Other		
Power Outlets 240v (Non-IT)	8 No. double sockets (ideally 2 on each wall within room).	
Power Outlets 240v (IT)	5 Double power sockets	
Power Outlets 120v	N/A	
Other	Audio Visual Connection for Interactive Whiteboard	
Data Outlets (RJ45)	Total 4 double data outlets	
Telephone	1 RJ45 for telephone connection	
Fire Alarms		
Emergency Lighting	Yes, as required by Building Control	
Smoke Detectors		
Security Systems		
Other		
Notes	Main Contractor to provide trunking and wiring routes for ICT and Client / End User to arrange installation of ICT and AV cabling.	
Date of Issue		

Design & Build





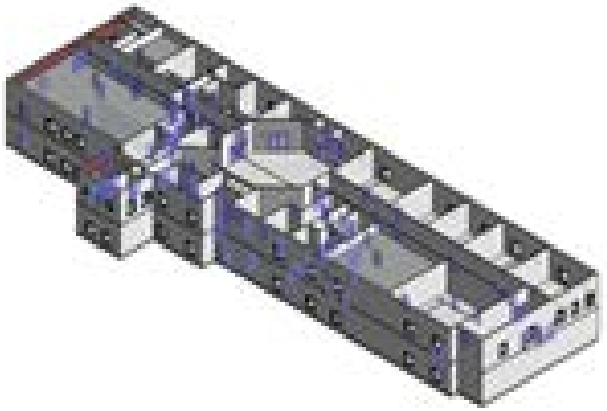




Name	CreatedBy	CreatedOn	Category	FloorName	Description	ExtSystem	ExtObject	ExtIdentifier	RoomTag	UsableHeight	GrossArea	NetArea
1	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	264874	n/a	n/a	51.2819	51.2819
2	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	264877	n/a	n/a	n/a	n/a
3	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	264881	n/a	n/a	31.8623	31.8623
4	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	264897	n/a	n/a	31.2375	31.2375
5	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	264900	n/a	n/a	n/a	n/a
6	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	264907	n/a	n/a	39.984	39.984
7	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	264910	n/a	n/a	n/a	n/a
8	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	265982	n/a	n/a	78.5681	78.5681
9	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	265985	n/a	n/a	73.7435	73.7435
10	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	265988	n/a	n/a	40.5579	40.5579
11	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	265991	n/a	n/a	13.4266	13.4266
12	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	265994	n/a	n/a	14.0258	14.0258
13	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	265997	n/a	n/a	116.627	116.627
14	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266000	n/a	n/a	12.5057	12.5057
15	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266003	n/a	n/a	15.6937	15.6937
16	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266006	n/a	n/a	24.4321	24.4321
17	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266009	n/a	n/a	32.6382	32.6382
18	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266012	n/a	n/a	14.8095	14.8095
19	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266015	n/a	n/a	12.1879	12.1879
20	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266018	n/a	n/a	26.7126	26.7126
21	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266021	n/a	n/a	13.67	13.67
22	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266024	n/a	n/a	19.1656	19.1656
23	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266027	n/a	n/a	139.9034	139.9034
24	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266030	n/a	n/a	35.1945	35.1945
25	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266033	n/a	n/a	26.0906	26.0906
26	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266036	n/a	n/a	9.9548	9.9548
27	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266039	n/a	n/a	26.143	26.143
28	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266042	n/a	n/a	9.48	9.48
29	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266045	n/a	n/a	10.8225	10.8225
30	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266048	n/a	n/a	10.1001	10.1001
31	mark@markbew.co.uk	2015-04-10T09:53:03	n/a	First Floor		Autodesk Revit 2014	Autodesk	266051	n/a	n/a	5.815	5.815

Handover, Operate & Measure - Data Collection

University of Salford MANCHESTER



Staff and teachers make good use of school resources. - impacts (Building Resources)

Agree	0 (0%)
Disagree	0 (0%)
Don't Know	1 (100%)

Evidence / example :
"Staff and teachers make good use of school resources available."

Suggestions :
None

Organisation & Design

How do you feel about the quality of the school building design?
Red = 0 (0%) Yellow = 1 (100%) Green = 0 (0%) Blue = 0 (0%)

The school building design eables the policies and processes of the staff to effectively deliver the needs of pupils. - impacts (Pupils & Community)

Agree	0 (0%)
Disagree	0 (0%)
Don't Know	1 (100%)

Evidence / example :
"The school building design eables the policies and processes of the staff to effectively deliver to the needs of pupils."

Suggestions :
None

The quality of the school building and its systems helps me carry out my tasks. - impacts (School Staff)

Agree	0 (0%)
Disagree	0 (0%)
Don't Know	1 (100%)

Evidence / example :
"The quality of the school and its systems helps me carry out my tasks."

Suggestions :
None

The building provides enough rooms and spaces and I can move easily between classes. - impacts (Programmes & Services)

Agree	0 (0%)
Disagree	0 (0%)
Don't Know	1 (100%)

Evidence / example :
"The building provides enough rooms and ability to move easily between classes."

	A
1	time"temp""pressure""humidity""voc""light""noise""noisedba""battery""shake""cable""voc_resistance""rssi"
2	2014-12-02T00:00:00Z210210074445204435FalseFalse41953-89
3	2014-12-01T23:59:00Z210210074445604435FalseFalse41893-89
4	2014-12-01T23:58:00Z210210074445404435FalseFalse41953-89
5	2014-12-01T23:57:00Z210210074445104435FalseFalse42073-89
6	2014-12-01T23:56:00Z210210074445004435FalseFalse42073-88
7	2014-12-01T23:55:00Z210210074445004435FalseFalse41833-89
8	2014-12-01T23:54:00Z210310074445004434FalseFalse41653-89
9	2014-12-01T23:53:00Z210310074445204435FalseFalse41474-89
10	2014-12-01T23:52:00Z210310064445004435FalseFalse41534-89
11	2014-12-01T23:50:00Z210310064445304435FalseFalse41295-89
12	2014-12-01T23:49:00Z210410074445104435FalseFalse41355-89
13	2014-12-01T23:48:00Z210410074445004433FalseFalse41414-89
14	2014-12-01T23:47:00Z210410064445004435FalseFalse41414-89
15	2014-12-01T23:46:00Z210510074445004435FalseFalse41355-89
16	2014-12-01T23:45:00Z210510064445004435FalseFalse41295-89
17	2014-12-01T23:44:00Z210510074445004435FalseFalse41295-89
18	2014-12-01T23:43:00Z210510074445104435FalseFalse41295-89

Digital Built Britain

Handover, Operate & Measure – Data Analysis

University of Salford MANCHESTER

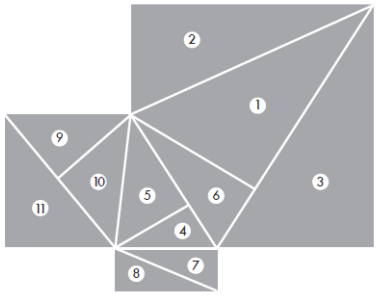
LOCATION : Media Suite **SENSOR :** S1

DIRECT BUILDING PHYSICS	FORMULA
The building spaces are operating within its briefed cost envelope	Where SOFI.World = User.role AND User.Space_Description THEN P_Rooms.Room_Target_Cost <= Impact.Name.Cost
Calculation to check if the actual delivered spaces meet the spaces specified in the brief and standards	p_room.requirednettarea >= space.nettarea
Comparison of identified environmental performance specified in the brief and the actual data collected using the remote sensors related to the consumption of fossil fuels	Where SOFI.World = User.role AND User.Space_Description THEN Sensor_Data.Light = P_Rooms.AmbientLight +/- 10% (or tolerance as briefed) Sensor_Data.Thermal < P_Rooms.MaxTemp Sensor_Data.Thermal > P_Rooms.MinTemp If Yes = Green If No = Red
Comparison of identified environmental performance specified in the brief and the actual data collected using the remote sensors	Where SOFI.World = User.role AND User.Space_Description THEN Sensor_Data.Light = P_Rooms.AmbientLight +/- 10% (or tolerance as briefed) Sensor_Data.Thermal < P_Rooms.MaxTemp Sensor_Data.Thermal > P_Rooms.MinTemp Sensor_Data.Humidity < P_Rooms.MaxHumidity Sensor_Data.Humidity < P_Rooms.MinHumidity Sensor_Data.Noise = P_Rooms.NoiseLevel +/- 10% (or tolerance as briefed) Sensor_Data.VOC = P_Rooms.AirRecycle +/- 10% (or tolerance as briefed) If Yes = Green If No = Red

TRIANGLES

#	CALCULATION	AREA
1	1/2 * 1900 * 1048	1 m²
2	1/2 * 2648 * 4815	6 m²
3	1/2 * 5353 * 3263	9 m²
4	1/2 * 1648 * 946	1 m²
5	1/2 * 1648 * 2173	2 m²
6	1/2 * 2734 * 1502	2 m²
7	1/2 * 2734 * 4767	7 m²
8	1/2 * 1900 * 1048	1 m²
9	1/2 * 2055 * 1823	2 m²
10	1/2 * 2055 * 1793	2 m²
11	1/2 * 2400 * 2705	3 m²

GROSS AREA = 35m²



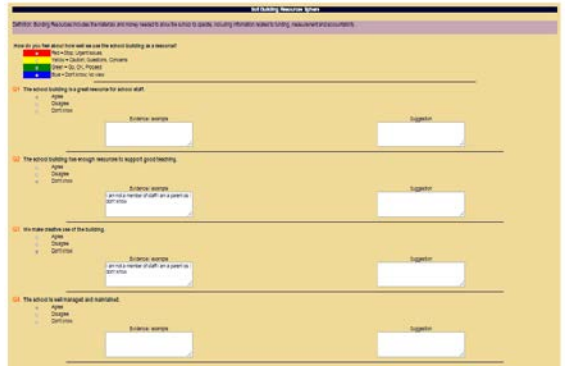
		TEMPERATURE (sensor)	TEMPERATURE (outside)	VOC	LIGHT	NOISE	HUMIDITY	PRESSURE
ACTUAL	Average Overall	23.9	6.6	626.4	309.8	44.8	32.1	1019.5
	Average Weekday	24.2	6.2	632.4	359.9	45.5	31.6	1019.5
	Peak High	31.2	13.0	3676.0	2410.0	80.0	45.0	1028.0
	Peak Low	19.0	4.0	400.0	0.0	41.0	10.0	1006.0
SPECIFICATION	High	26.0	–	1000.0	8000.0	60.0	55.0	–
	Low	23.0	–	450.0	300.0	40.0	45.0	–
RAG	High							
	Low							
	Average							

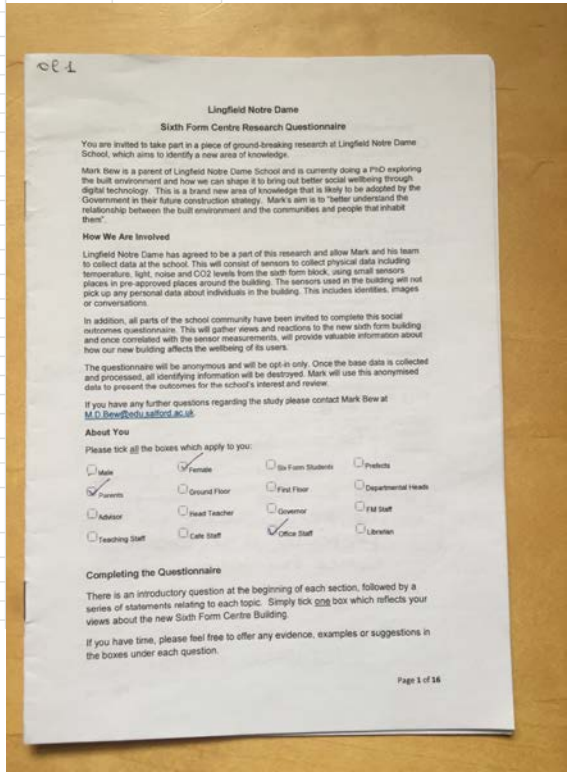
Digital Built Britain

Social Data Collection

		School 1
How do you feel about the way that your school serves you and your local community?	RAGB	G
Q1 Pupils and members of the local community have easy access to members of staff when help is needed.	Y/N/D	Y
Q2 Pupils and the local community are encouraged to give feedback about how the school meets their needs.	Y/N/D	D
Q3 Pupils and the local community are keen to access the services that the school provides.	Y/N/D	D
How good do you think the schools staff are?	RAGB	G
Q1 Professional and support staff are focused on meeting the needs of the pupils and the community.	Y/N/D	Y
Q2 All staff roles and responsibilities are well understood.	Y/N/D	D
Q3 Staff actions encourage pupils and the community to actively use the services that the school offers.	Y/N/D	D
Q4 Staff are actively encouraged to continuously develop new skills	Y/N/D	D
Q5 Staff throughout the school have the right combination of skills & qualities to do their jobs well.	Y/N/D	Y
Q6 Staff get appropriate compensation for their work.	Y/N/D	D
How well is the school operated?	RAGB	G
Q1 The school actively gathers feedback from pupils and the community to improve its services.	Y/N/D	Y
Q2 Everyone in the school knows what they should be doing	Y/N/D	D
Q3 The school's procedures and structure makes it easy for people to access what the school offers.	Y/N/D	D
Q4 The school is well structured to support innovation and development.	Y/N/D	D
Q5 The school's procedures and structure provide an efficient system to provide the conditions for effective learning.	Y/N/D	Y
Q6 The school's procedures and organisational structure contribute to a healthy and effective culture.	Y/N/D	D
How good is the school?	RAGB	G
Q1 The school is attracting the pupils and community users of its services that it would wish to attract.	Y/N/D	Y
Q2 The school provides enough staff to pupils and community activities.	Y/N/D	D
Q3 The school communicates and works with pupils and all of the community effectively.	Y/N/D	D
Q4 The way the school has of making and keeping contact with pupils and the community contributes to the development of its services and reputation.	Y/N/D	D
Q5 The school is achieving the financial targets necessary for it to fulfil its ambitions.	Y/N/D	Y
Q6 The way the school makes and maintains contact with all those whom it serves helps create the culture a fantastic culture.	Y/N/D	D

	The Building Culture Development Staff Pupils	
Breifing Operations Structure		Communication Finance Services





Lingfield Notre Dame

Sixth Form Centre Research Questionnaire

You are invited to take part in a piece of ground-breaking research at Lingfield Notre Dame School, which aims to identify a new area of knowledge.

Mark Bew is a parent of Lingfield Notre Dame School and is currently doing a PhD exploring the built environment and how we can shape it to bring out better social wellbeing through digital technology. This is a brand new area of knowledge that is likely to be adopted by the Government in their future construction strategy. Mark's aim is to "better understand the relationship between the built environment and the communities and people that inhabit them".

How We Are Involved

Lingfield Notre Dame has agreed to be a part of this research and allow Mark and his team to collect data at the school. This will consist of sensors to collect physical data including temperature, light, noise and CO2 levels from the sixth form block, using small sensors placed in pre-aproved places around the building. The sensors used in the building will not pick up any personal data about individuals in the building. This includes identities, images or conversations.

In addition, all parts of the school community have been invited to complete this social outcomes questionnaire. This will gather views and reactions to the new sixth form building and once correlated with the sensor measurements, will provide valuable information about how our new building affects the wellbeing of its users.

The questionnaire will be anonymous and will be opt-in only. Once the base data is collected and processed, all identifying information will be destroyed. Mark will use this anonymised data to present the outcomes for the school's interest and review.

If you have any further questions regarding the study please contact Mark Bew at M.D.Bew@edu.salford.ac.uk

About You

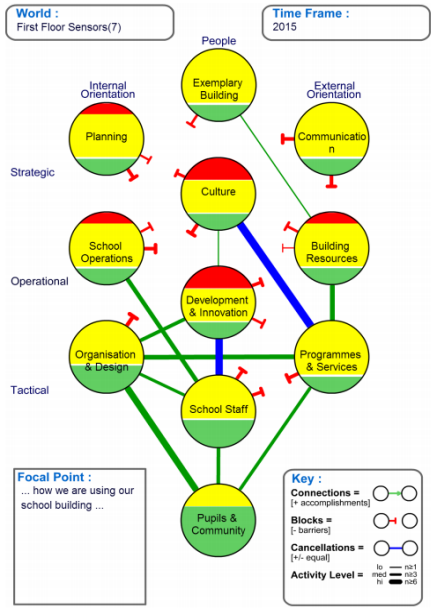
Please tick all the boxes which apply to you:

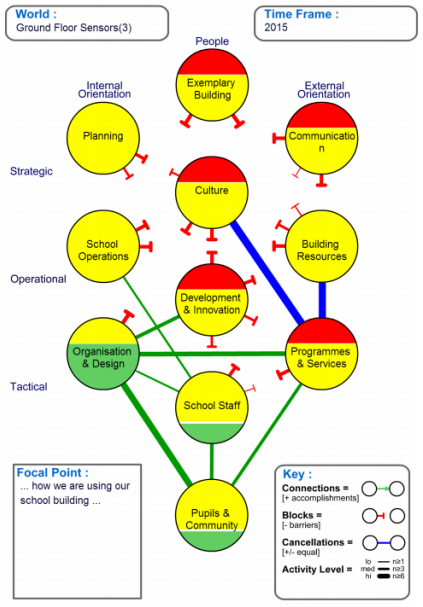
Completing the Questionnaire

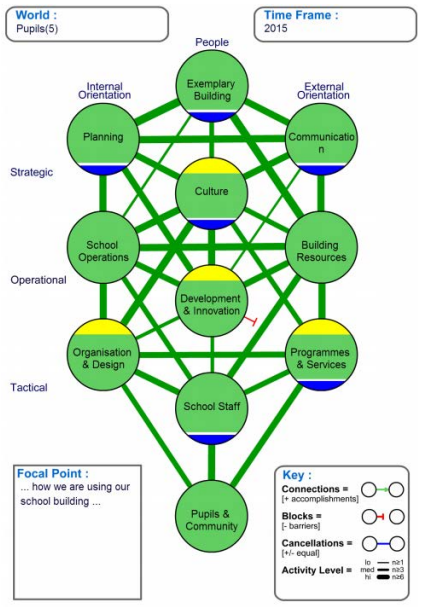
There is an introductory question at the beginning of each section, followed by a series of statements relating to each topic. Simply tick one box which reflects your views about the new Sixth Form Centre Building.

If you have time, please feel free to offer any evidence, examples or suggestions in the boxes under each question.

Analysis


World :
First Floor Sensors(7)
Time Frame :
2015
People
Internal Orientation
External Orientation
Strategic
Operational
Tactical
Exemplary Building
Planning
Communicatio n
Culture
School Operations
Building Resources
Development & Innovation
Organisation & Design
Programmes & Services
School Staff
Pupils & Community
Focal Point :
... how we are using our school building ...
Key :
Connections =
[+ accomplishments]
Blocks =
[- barriers]
Cancellations =
[+/- equal]
Activity Level =


World :
Ground Floor Sensors(3)
Time Frame :
2015
People
Internal Orientation
External Orientation
Strategic
Operational
Tactical
Exemplary Building
Planning
Communicatio n
Culture
School Operations
Building Resources
Development & Innovation
Organisation & Design
Programmes & Services
School Staff
Pupils & Community
Focal Point :
... how we are using our school building ...
Key :
Connections =
[+ accomplishments]
Blocks =
[- barriers]
Cancellations =
[+/- equal]
Activity Level =


World :
Pupils(5)
Time Frame :
2015
People
Internal Orientation
External Orientation
Strategic
Operational
Tactical
Exemplary Building
Planning
Communicatio n
Culture
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Programmes & Services
School Staff
Pupils & Community
Focal Point :
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Key :
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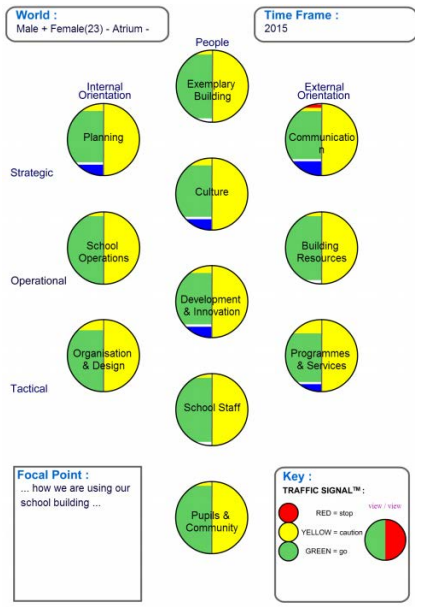
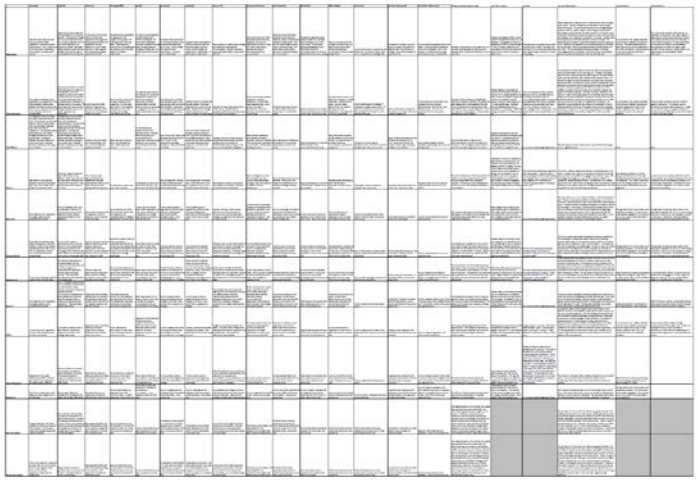
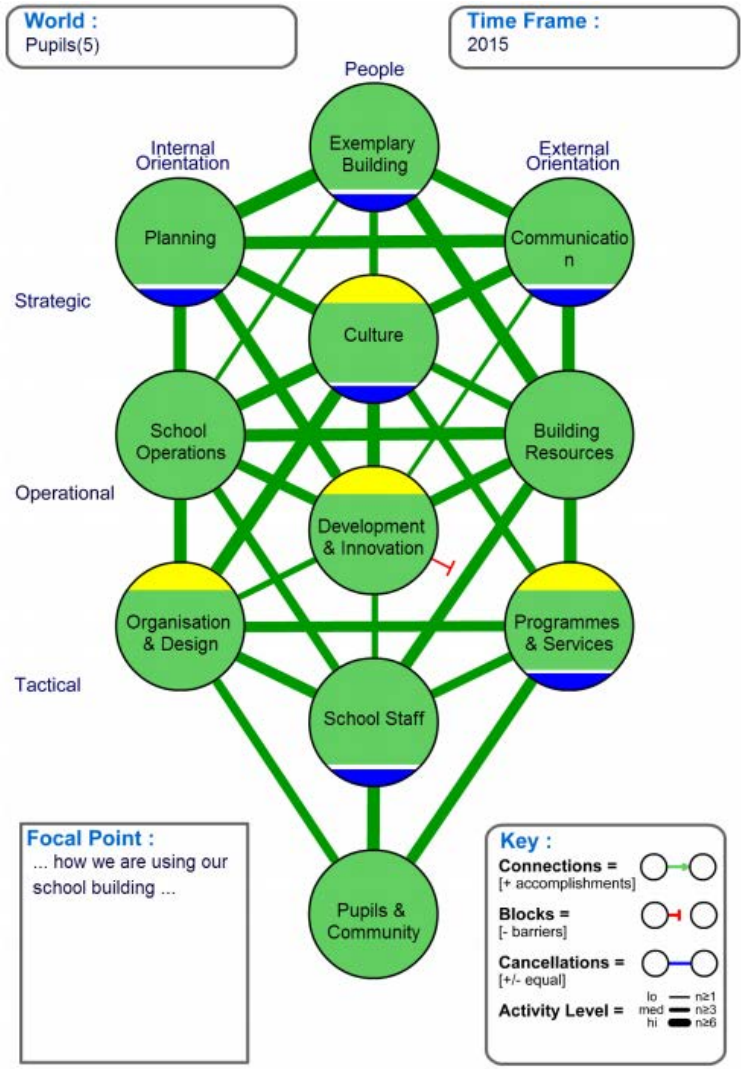
[+ accomplishments]
Blocks =
[- barriers]
Cancellations =
[+/- equal]
Activity Level =


World :
Male + Female(23) - Atrium -
Time Frame :
2015
People
Internal Orientation
External Orientation
Strategic
Operational
Tactical
Exemplary Building
Planning
Communicatio n
Culture
School Operations
Building Resources
Development & Innovation
Organisation & Design
Programmes & Services
School Staff
Pupils & Community
Focal Point :
... how we are using our school building ...
Key :
TRAFFIC SIGNAL™ :
RED = stop
YELLOW = caution
GREEN = go



Findings


World :
Pupils(5)
Time Frame :
2015
People
Internal Orientation
External Orientation
Exemplary Building
Planning
Communicatio n
Strategic
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School Operations
Building Resources
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School Staff
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Key :
Connections =
[+ accomplishments]
Blocks =
[- barriers]
Cancellations =
[+/- equal]
Activity Level =
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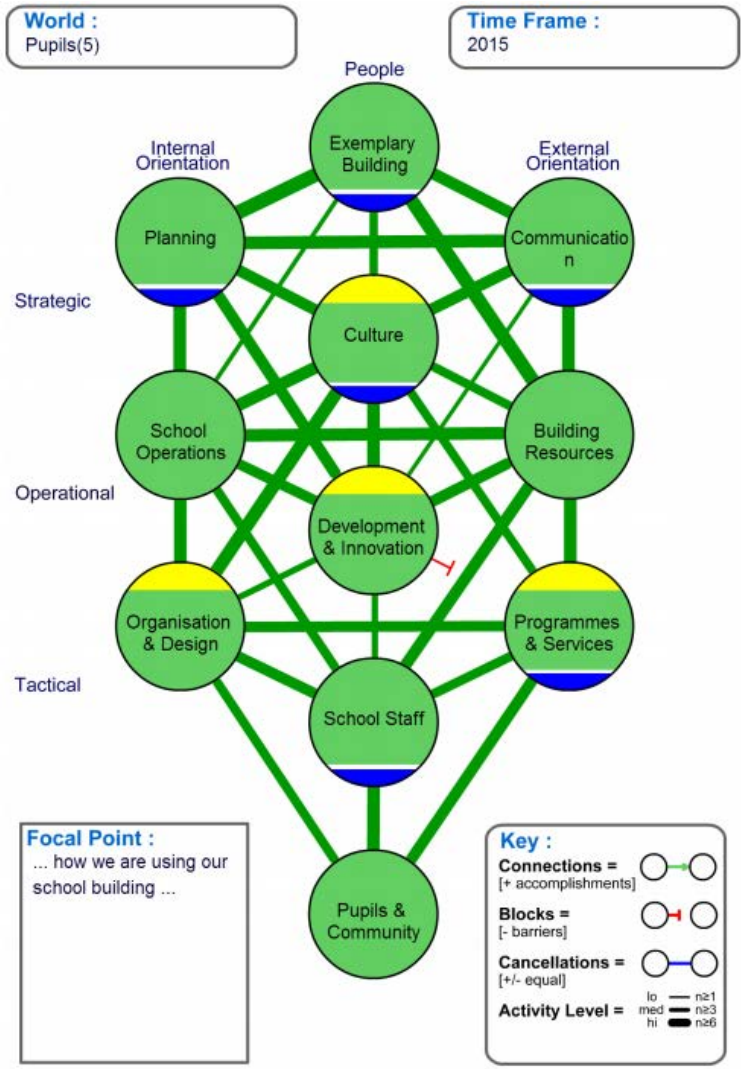
n≥1
n≥3
n≥6

Findings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Pupils(5)
Time Frame :
2015
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Internal Orientation
External Orientation
Exemplary Building
Planning
Communicatio n
Strategic
Culture
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Building Resources
Operational
Development & Innovation
Organisation & Design
Programmes & Services
Tactical
School Staff
Pupils & Community
Focal Point :
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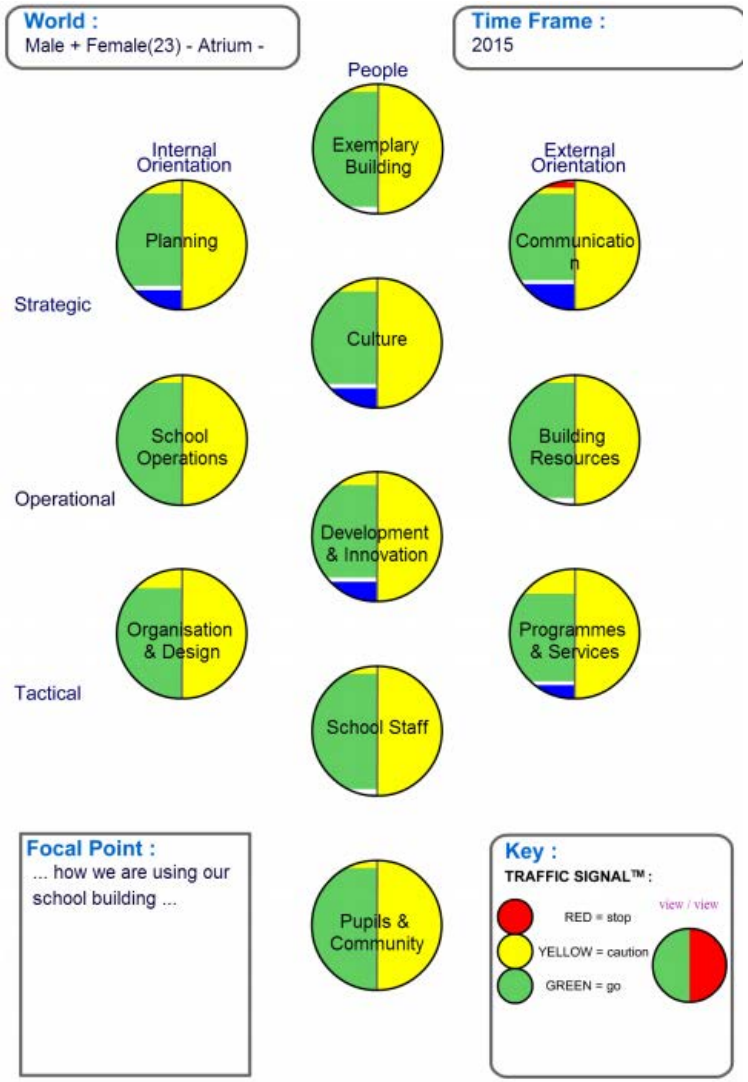
Key :
Connections =
[+ accomplishments]
Blocks =
[- barriers]
Cancellations =
[+/- equal]
Activity Level =
lo
med
hi
n≥1
n≥3
n≥6


World :
Male + Female(23) - Atrium -
Time Frame :
2015
People
Internal Orientation
External Orientation
Exemplary Building
Planning
Communicatio n
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... how we are using our school building ...
Key :
TRAFFIC SIGNAL™ :
RED = stop
YELLOW = caution
GREEN = go
view / view

HM Government
Construction

Moving from Productivity to Social Outcomes

The Journey from Level 3 to 4

Dr Mark Bew MBE

Digital Built Britain