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The Ultimate BIM Summit **31 January 2018**

BIM - its about the Planet:

..... the purpose of BIM in improving the performance of the construction industry and building a better world together in a global context.

Keith Snook HonMCIAT

BIM - its about the Planet:

- Not about how to operate BIM systems
- No software
- A cause and a photograph (and a tv programme?)
- UK government 'BIM initiative' – fleeting mention
- Data
- Environmental assessment
- Two elephants
- Continual improvement
- Poem

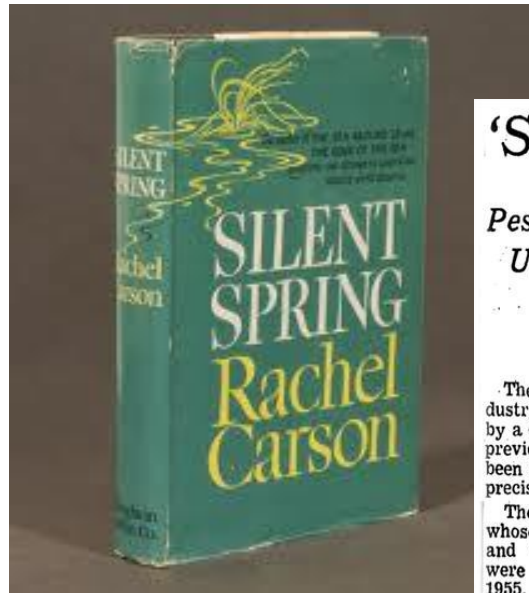


The Environment:

“In nature
nothing
exists alone

- Rachel Carson,
Silent Spring.

1962



1967



‘Silent Spring’ Is Now Noisy Summer

*Pesticides Industry
Up in Arms Over
a New Book*

By JOHN M. LEE

The \$300,000,000 pesticides industry has been highly irritated by a quiet woman author whose previous works on science have been praised for the beauty and precision of the writing.

The author is Rachel Carson, whose “The Sea Around Us” and “The Edge of the Sea” were best sellers in 1951 and 1955. Miss Carson, trained as a marine biologist, wrote gracefully of sea and shore life.

In her latest work, however, Miss Carson is not so gentle,



*Rachel Carson Stirs
Conflict—Producers
Are Crying ‘Foul’*

fending the use of their products. Meetings have been held in Washington and New York. Statements are being drafted and counter-attacks plotted.

A drowsy midsummer has suddenly been enlivened by the greatest uproar in the pesticides industry since the cranberry scare of 1959.

Miss Carson's new book is entitled “Silent Spring.” The title is derived from an idealized situation in which Miss Carson envisions an imaginary town where chemical pollution has silenced “the voices of spring.”





So what does this have to do with BIM?



“Government as a client can derive significant improvements in cost, value and carbon performance through the use of open sharable asset information”

The Planet + data

Data

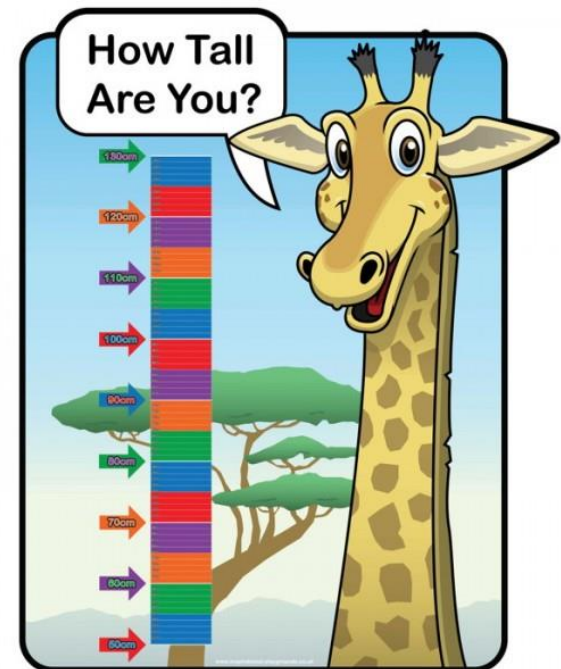
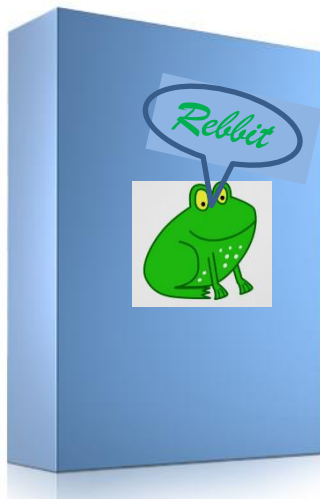
is the plural of datum which means fact



and if kept this pure is universal if not friendly to human perception

Data

is also used to describe values in a quantified and qualified way



‘Programmes’ made with smoke and mirrors – a long way from 0s and 1s

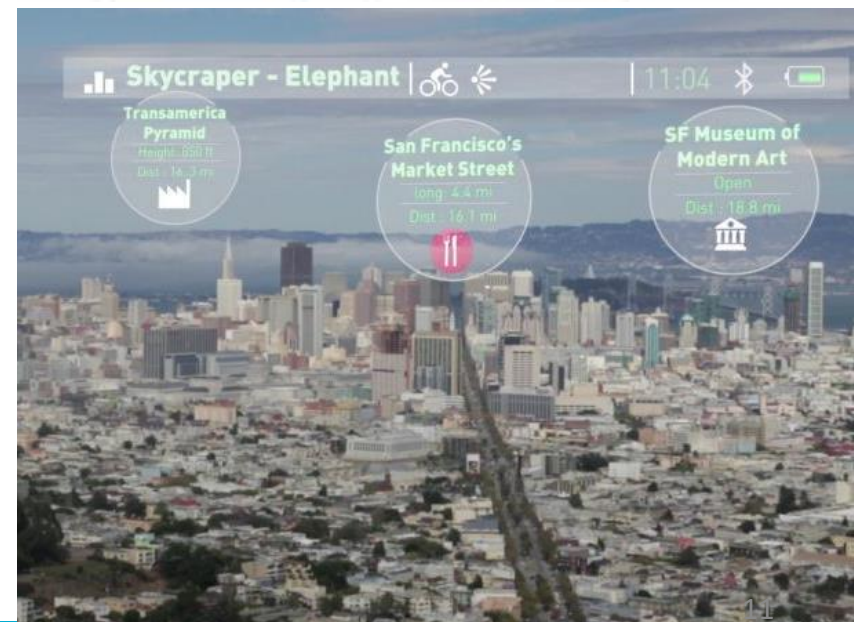
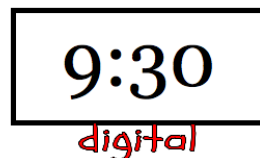
Data



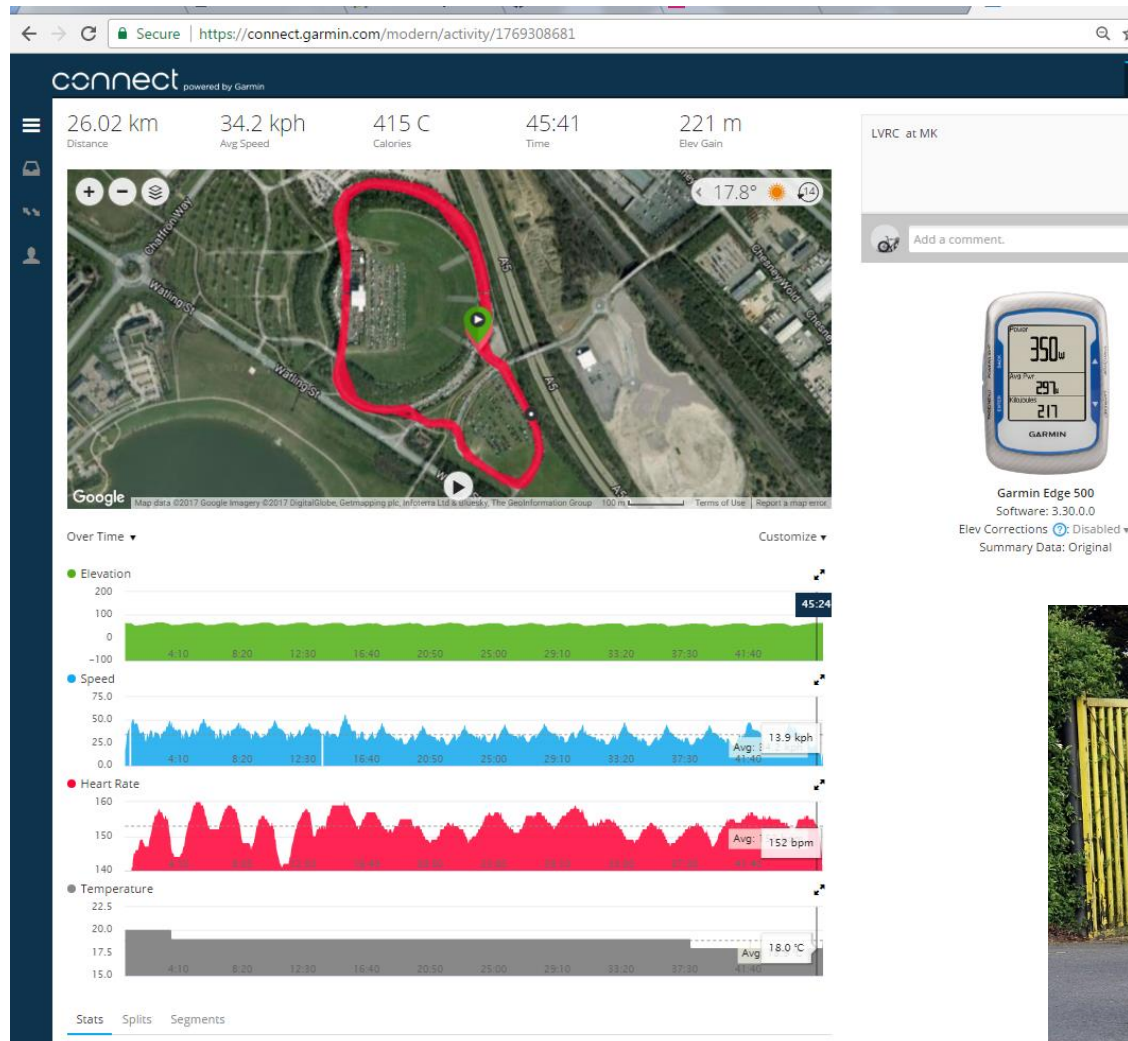
Ubiquitous data

Data is now everywhere and we do not know how best to use most of it creatively.

In forty years we've moved from an analogue society of paper and fixed telephone to a place where we are rapidly representing, our entire world as a digital landscape.



Data centric digital world



Data centric digital world

connect

powered by Garmin

Fitness

Activities

Activity Type:

Any Activity Type

Event Type:

Any Event Type

Course:

All Courses

Time Period:

All Days

Distance:

- Kilometers

Time:

- Hours

Elevation Gain:

- Meters

Search

Quick Edit

Delete

Compare Activities

Favorites

Assign PR

+ Manual Activity

<div></div>	Activity Name	Activity Type	Course	Start	Distance	Time	Avg Speed	Max Speed	Elevation	Avg HR	Max HR	Calories	sumStr
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Tue, 30 May 2017 19:04	26.02	45:41	34.2	55.7	221	153	160	415	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Sun, 28 May 2017 9:59	50.21	1:42:55	29.3	56.9	386	143	161	832	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Fri, 26 May 2017 13:35	50.17	1:44:57	28.7	60.4	390	148	162	881	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Thu, 25 May 2017 14:50	51.31	1:44:46	29.4	54.1	378	147	163	874	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Tue, 23 May 2017 19:03	26.65	46:29	34.4	87.8	230	153	164	428	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Sat, 20 May 2017 12:24	49.31	1:41:24	29.2	53.7	383	143	157	824	7,823
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Tue, 16 May 2017 19:04	18.77	35:32	31.7	49.2	156	144	163	284	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Sun, 14 May 2017 8:40	53.47	1:53:52	28.2	85.8	407	139	165	894	8,806
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Thu, 11 May 2017 14:54	37.66	1:11:19	31.7	50.6	200	151	165	649	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Tue, 9 May 2017 19:03	30.02	50:40	35.5	53.6	262	155	165	473	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Sun, 7 May 2017 9:43	50.73	1:44:20	29.2	57.7	411	147	160	893	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Tue, 2 May 2017 19:06	25.81	45:22	34.1	52.2	257	147	163	387	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Mon, 1 May 2017 9:47	26.54	1:00:15	26.4	41.1	120	140	155	489	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Sat, 29 Apr 2017 15:52	50.15	1:41:44	29.6	56.5	402	144	156	819	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Fri, 28 Apr 2017 18:38	30.18	56:35	32.0	48.2	124	152	159	518	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Sun, 23 Apr 2017 9:30	50.63	1:43:03	29.5	60.1	426	147	157	882	--
<div></div>	<div></div> <div>Untitled</div>	Cycling	--	Tue, 18 Apr 2017 18:37	36.52	1:11:50	30.5	46.0	177	147	162	627	--

Data centric digital world

Is it so much different from a COBie spreadsheet?

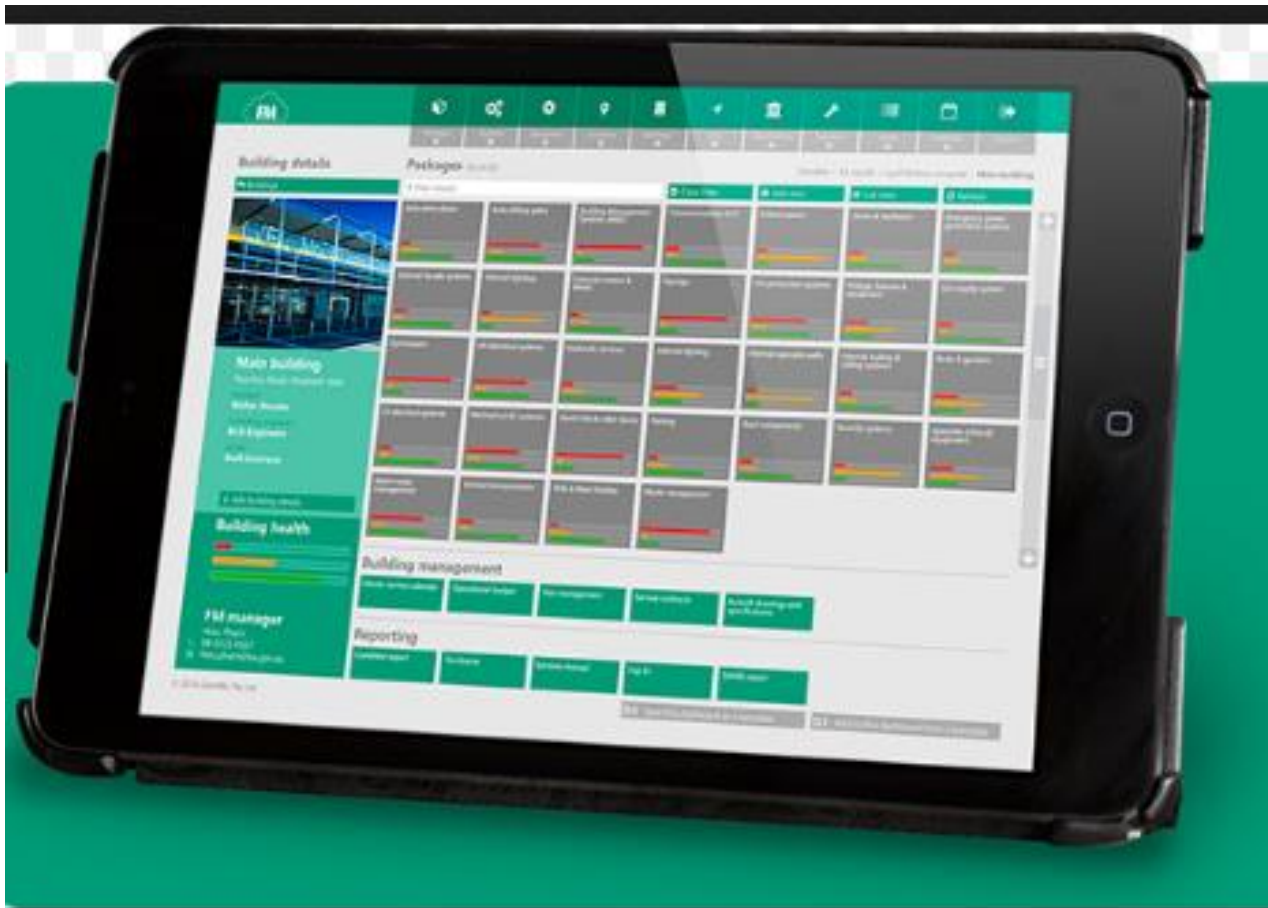
BIM is data

	A	B	C	D	E	F	G	H	I	J	K	L	M
	Name	CreatedBy	CreatedOn	Category	FloorName	Description	ExSystem	ExObject	ExIdentifier	RoomTag	UsableHeight	GrossArea	NetArea
1													
2	1A01	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-11 11 31: Reception Space	Site	PATIENT ADMIN. RECEPT.	Autodesk	IfcSpace	02tdC3L	n/a	8.85807	212.77	212.77
3	1A02	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-15 11 34 11: Office	Site	RMO ANALYST	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	286.94	286.94
4	1A03	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-15 11 34 11: Office	Site	TRICARE OFFICETRICARE OFFICETRICARE OFFI	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	87.82	95.52
5	1A04	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-15 11 34 11: Office	Site	TRICARE OFFICETRICARE OFFICETRICARE OFFI	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	92.46	92.46
6	1A05	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-15 11 34 11: Office	Site	TRICARE OFFICETRICARE OFFICETRICARE OFFI	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	89.32	89.32
7	1A06	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-15 11 34 11: Office	Site	TRICARE OFFICETRICARE OFFICETRICARE OFFI	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	100.4	112.94
8	1A07	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-15 11 34 11: Office	Site	TRICARE OFFICE	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	93.97	85.78
9	1A08	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-15 11 34 11: Office	Site	PHARM. OFFICE	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	112.48	112.48
10	1A09	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-41 11 14 21: Restroom	Site	W. TOILET	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	116.83	116.83
11	1A10	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-51 11 21: Break Room	Site	LOUNGE	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	110.57	102.46
12	1A11	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-75 11 11: Storage Room	Site	JAN.	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	18.07	21.92
13	1A12	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-41 11 14 21: Restroom	Site	M. TOILET	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	98.46	106.68
14	1A13	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-41 11 14 21: Restroom	Site	STAFF TOILET	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	42.38	48.1
15	1A14	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-15 11 34 11: Office	Site	SUPER / NCOIC	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	77.82	77.82
16	1A15	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-41 41 99: Other Dressing Spaces	Site	COUNSELING	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	63.16	68.87
17	1A16	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-75 11 11: Storage Room	Site	PHARM. DISP.	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	702.07	702.07
18	1AC1	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-51 31 11: Waiting Room	Site	CENTRAL WAITING	Autodesk	IfcSpace	02tdC3L	n/a	14.9935	1504.31	1504.31
19	1AC2	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-85 11 11: Corridor	Site	CORRIDOR	Autodesk	IfcSpace	02tdC3L	n/a	14.6654	211.03	205.57
20	1AC3	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-85 11 11: Corridor	Site	CORRIDOR	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	161.55	161.55
21	1AC4	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-85 11 11: Corridor	Site	CORRIDOR	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	94.72	102.81
22	1AC5	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-85 11 11: Corridor	Site	CORRIDOR	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	219.32	219.32
23	1AS1	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-85 21 11: Stairway	Site	STAIR	Autodesk	IfcSpace	02tdC3L	n/a	30.3477	146.14	151.32
24	1B01	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-11 11 31: Reception Space	Site	RECEPTION	Autodesk	IfcSpace	02tdC3L	n/a	8.52995	101.99	94.81
25	1B02	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-41 11 14 21: Restroom	Site	SPECIMEN TOILET	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	59.72	59.72
26	1B03	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-41 41 99: Other Dressing Spaces	Site	BLOOD DRAW	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	104.21	104.21
27	1B04	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-15 11 24 11: Laboratory	Site	LAB	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	576.82	576.82
28	1B05	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-41 11 14 21: Restroom	Site	PAT. / STAFF TOILET	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	51.55	45.39
29	1B06	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-15 11 34 11: Office	Site	LAB OFFICE	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	112.76	100.65
30	1B07	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-41 11 41 11: Dressing Room	Site	DRESS	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	47.59	47.59
31	1B08	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-75 11 11: Storage Room	Site	CENT. STO.	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	105.13	105.13
32	1B09	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-41 11 41 11: Dressing Room	Site	DRESS	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	44.4	44.4
33	1B10	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-51 11 21: Break Room	Site	STAFF LOUNGE	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	110.69	110.69
34	1B11	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-41 11 14 21: Restroom	Site	STAFF TOILET	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	53.75	53.75
35	1B12	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-75 11 11: Storage Room	Site	CLEAN SUP. & EQUIP.	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	35.54	41.99
36	1B13	danielle.r.love@usace.army.mil	Monday, December 30, 2013	13-11 11 31: Reception Space	Site	RECEPTION	Autodesk	IfcSpace	02tdC3L	n/a	7.8737	231	231

Data centric digital world

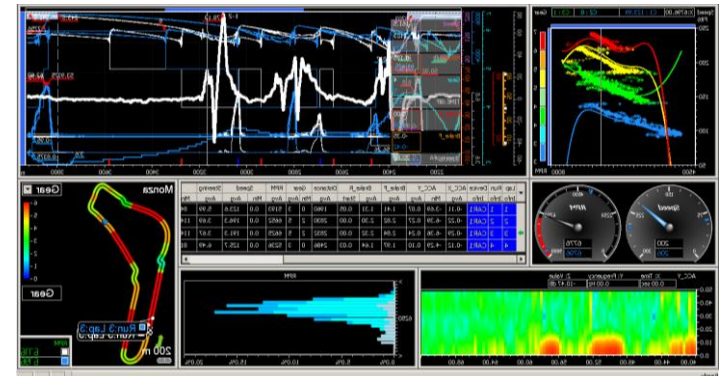
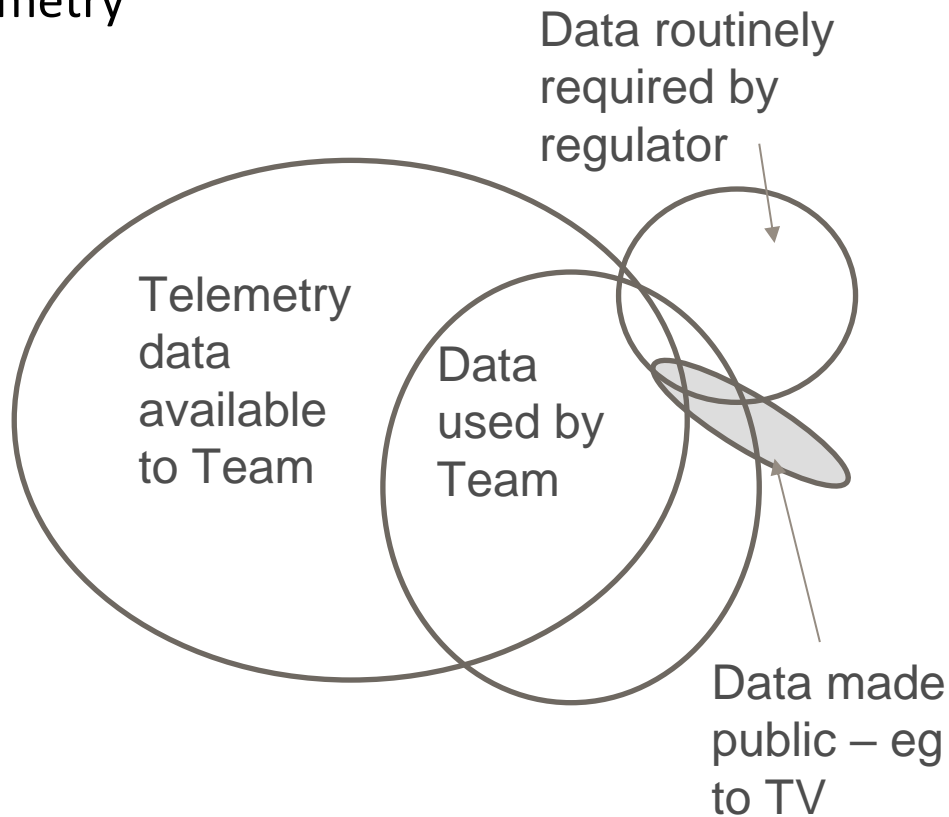


Data centric digital world



Data centric digital world

It is difficult to not be impressed by Formula 1 motor racing telemetry



Could this provide us with a useful model?

The power of data



Tesla – sells 25,000 cars a year

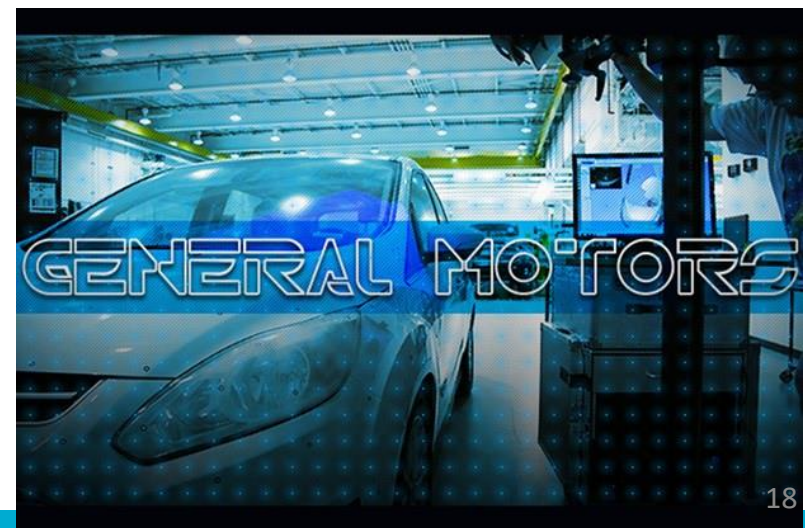
Notwithstanding setbacks; the self driving car generates 100 Gbytes of data per second

More data = greater improvement
“*Continual improvement*” a concept we will return to

GM – sells 2.3 million cars a year

Tesla now “worth more than GM”

(on share capitalisation - Economist 06.6.17)





Environmental assessment over the data horizon:



Environmental assessment over the data horizon: The elephant in the room

“Ninety percent of the buildings we will be using in fifty years’ time are the ones we can see from the window now”.

- No, it never seems to work for me, particularly when the view is the BRE innovation park.
- Nevertheless it represents a pretty firm picture of one of the elephants in the global sustainability room, particularly in relation to environmental assessment.
- A related elephant has been lurking in its hiding place in the shadows of the room - the performance gap (between design and operation).

*And that shadowy inverted image also represents about how much we **really** understand about it so far*



Environmental assessment over the data horizon

Many experts have their view on the performance gap

bre

“Bridging the performance gap” – understanding predicted and actual building operational energy

Name of Presenter: Dr Andy Lewry

Part of the BRE Trust

© BRE 2014

bre

ESTA IN DEPTH

IP 1/15

Information Paper

Bridging the performance gap

Understanding predicted and actual energy use of buildings

Andy Lewry

Operators of commercial and public (ie non-domestic) buildings need clear and realistic guidance on targeting energy running costs for their properties and on the potential savings available. At their disposal are two seemingly irreconcilable indicators of performance: the asset rating (eg energy performance certificate or EPC), which provides a theoretical assessment of the asset under standard 'driving conditions' typical of that type of building in that location; and the operational rating (eg display energy certificate or DEC), which is based on energy bills so gives no indication of how much lower running costs could be. To truly understand how a building uses energy, it is necessary to know how the building has been designed and how it is used; this requires both an asset rating and an operational rating.

The difference between these ratings – or between the predicted and actual performance of buildings – is known as the 'performance gap'. This Information Paper looks at a way to bridge this gap and bring together these two assessments using the Green Deal assessment tool for non-domestic buildings, which allows the input of non-standard operating conditions, hours of operation and occupancy patterns. By defining these aspects of the building 'in use', the predicted energy performance of the asset can be brought closer to the in-use reality.

This publication is aimed at all those working to identify energy waste and deciding on energy-saving measures and programmes.



Figure 1: Buildings rarely perform as well as their designers predicted and energy consumption can be as much as double what was expected; this difference has become known as the 'performance gap'

Acknowledgements

The author would like to thank the Energy Services and Technology Association (ESTA), the UK's leading energy management industry association (www.esta.org.uk), for both its financial contribution to the production of this Information Paper and for organising an industry steering group.

With gratitude for the contributions of the steering group:

- John Field (Native-Hue)
- Martin Fry (Martin R Fry & Associates)
- Robin Hale (Executive Director of ESTA)
- Andrew Innes (EAV Associates & Financial Energy Ltd)

1 Introduction

But so far we have only scratched the surface, a lot more research is needed and to do that data is required

2007

↪ 3x ↩

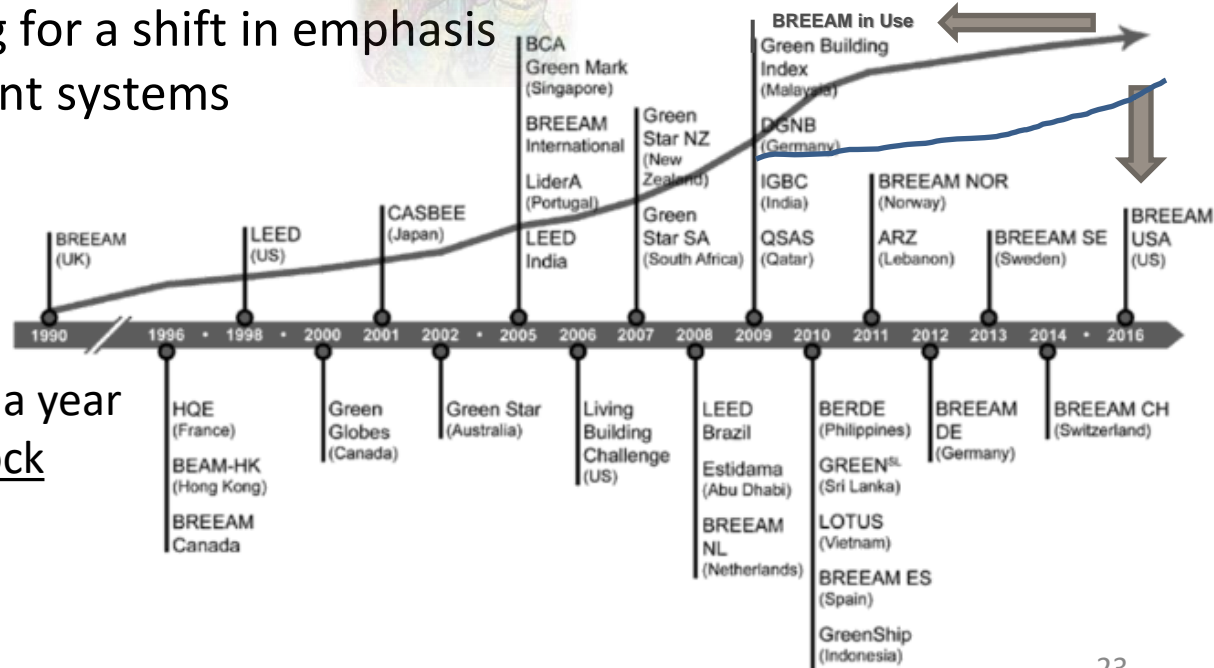
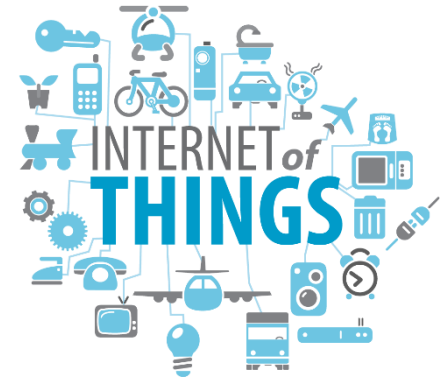
Environmental assessment over the data horizon

So, we have the elephants:

- the existing building stock and
 - the performance gap
- and
- the rapid advances in ‘things’

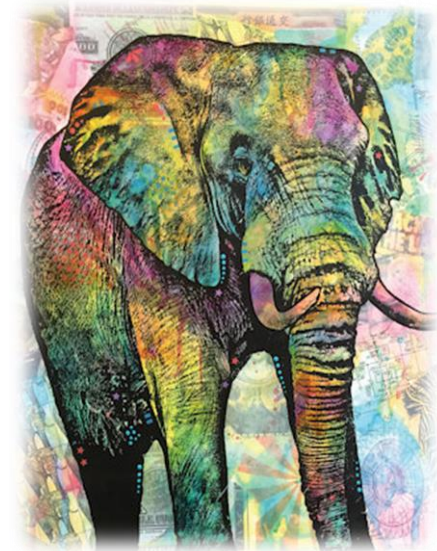
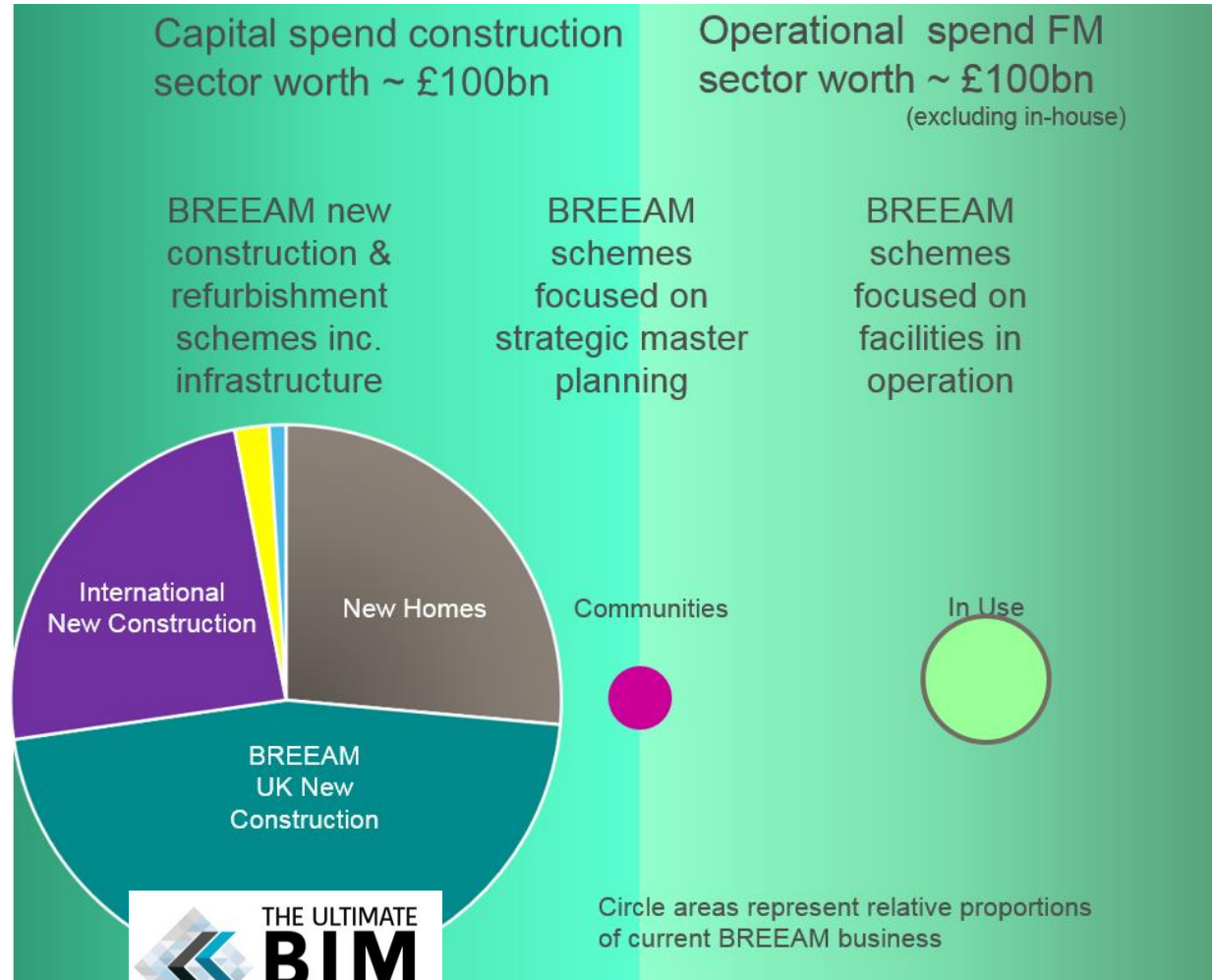
Maybe we should be looking for a shift in emphasis for environmental assessment systems such as BREEAM.

NB Buildings and other assets come Into Use as soon as they are occupied and certainly after a year they are legitimately existing stock



So it looks like BREEAM is beginning to consider the first elephant Existing buildings

But where is it relative to the market?



And what about elephant # 2?

BREEAM in Use

BREEAM In-Use is a journey to understand and improve the performance of a building or portfolio

Establishing current operational practices

Bridging the 'performance gap'

Measuring and understanding the performance of a building or portfolio of buildings will assist in achieving designed levels of performance. By undertaking a BREEAM In-Use assessment, users can start planning improvements and stimulating positive change based on actual performance data and transform modelled outputs into actual outputs.

Realising operational and financial benefits

Reducing operational costs

By reviewing both consumption data and operational and maintenance procedures, BREEAM In-Use enables clients to highlight good performance, formalise processes and pro-actively maintain the building.

This process helps in identifying where improvements can be made so that operational costs can be reduced and managed effectively, whilst delivering environmental benefits.

Increasing operational efficiency

More than 70% of those who use BREEAM In-Use indicated that their building operation was significantly improved by regularly updating environmental performance targets and policies, an outcome of completing a BREEAM In-Use assessment.

Within BREEAM In-Use, users are rewarded for implementing policies, systems and procedures that encourage optimum use and management of the building.

Bridging the 'performance gap'

Measuring and understanding the performance of a building or portfolio of buildings will assist in achieving designed levels of performance. By undertaking a BREEAM In-Use assessment, users can start planning improvements and stimulating positive change based on actual performance data and transform modelled outputs into actual outputs.

Improving health and wellbeing

Healthy, comfortable and safe working environments contribute to increased occupier satisfaction, lower staff turnover and increased productivity. BREEAM In-Use rewards

Case study

La Caserne de Bonne,
Grenoble, France – MERCIALYS



Bonne is a shopping centre of Grenoble, France. Built in 2010, forms part of a conversion of a former military into a mixed-use district with offices, housing, a student residence

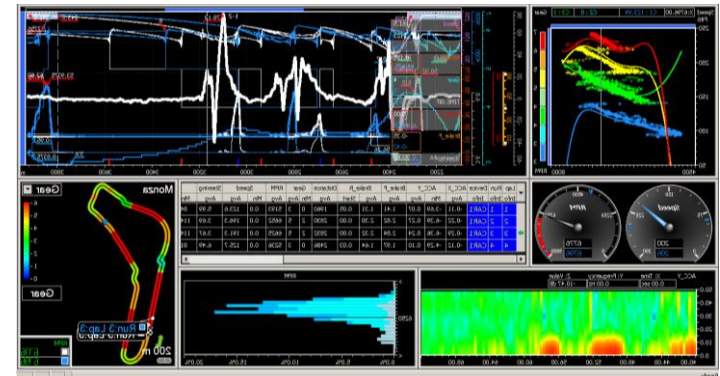
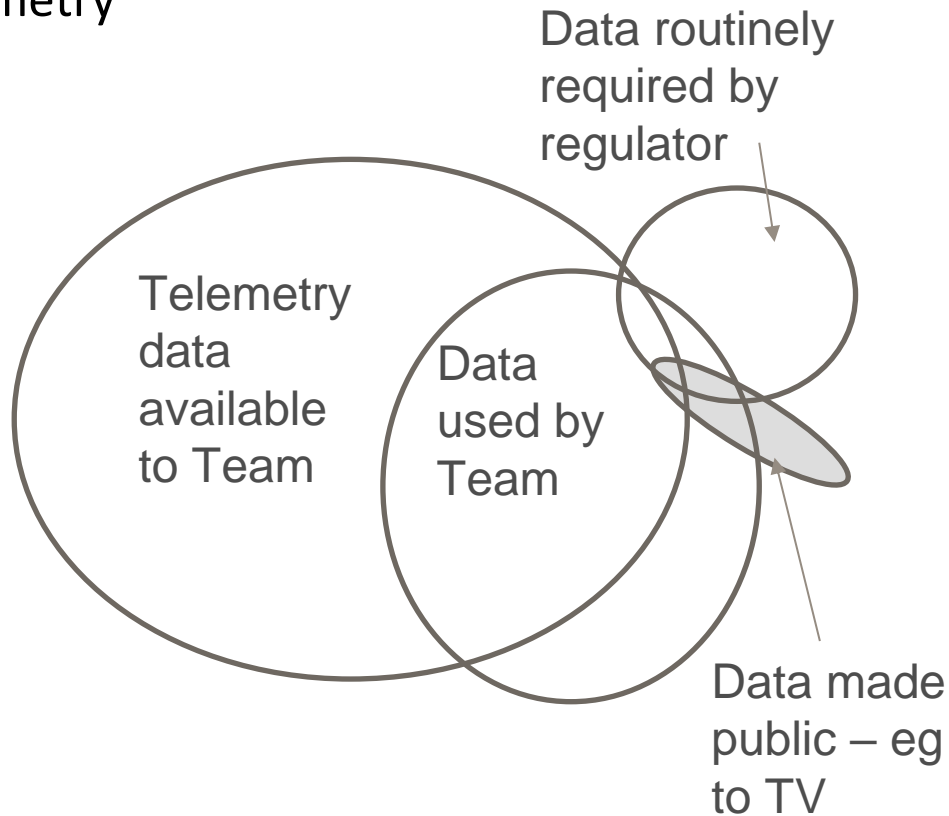
In process introduced the of new guidelines regarding procedures, ensuring continuity of performance in the event the company management team changed. It since the dialogue between all with regard to environmental improved the performance of the g run. For investors, certification designed, environmentally managed retail centre which und class of asset investment.

environmental criteria and its high standards have been prime elements in Mercialis choosing BREEAM In-Use as the core certification tool for environmental matters.



Remember this? Data centric digital world

It is difficult to not be impressed by Formula 1 motor racing telemetry



Could this provide us with a useful model?

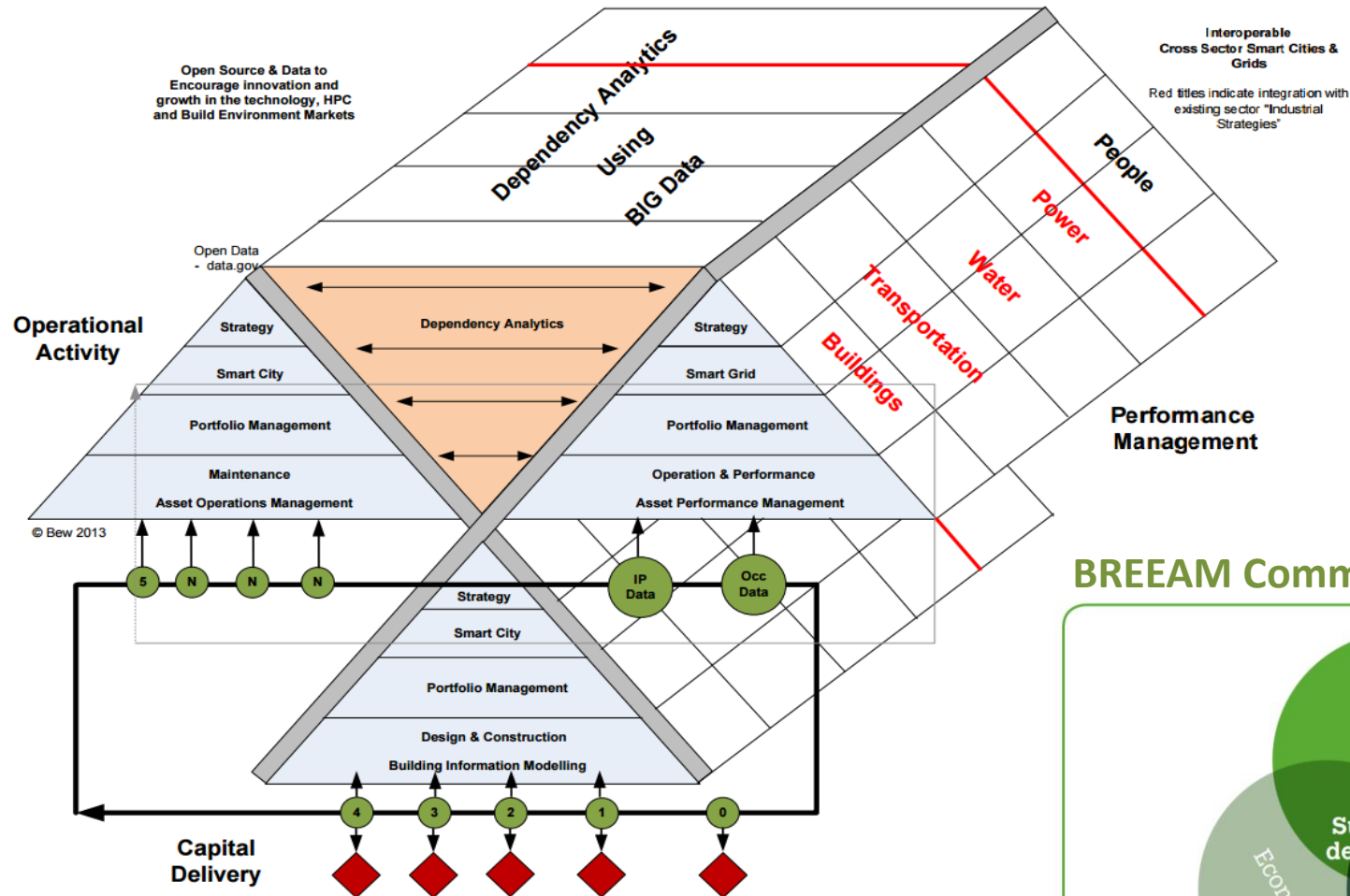
BREEAM Futures

Inspired by that, there are a number of reasons for BREEAM thinking about building telemetry – top of the list are:

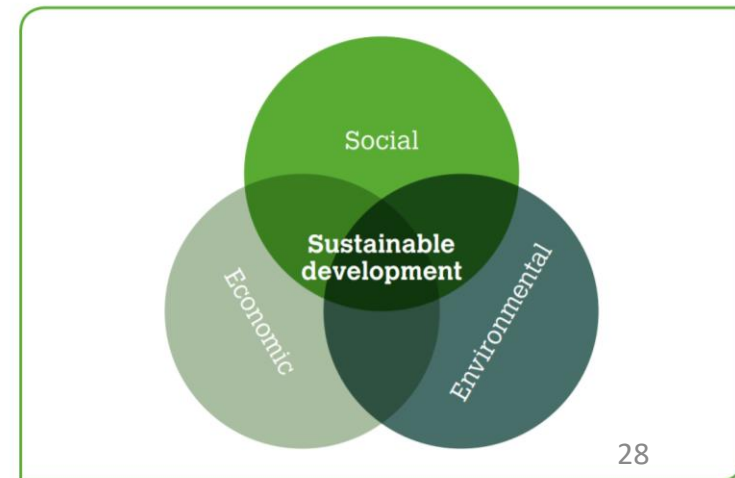
- Collecting real-time data to help unlock the mysteries of the performance gap and using that to create effective, responsive continual improvement measures and programmes well beyond that from ‘smart’ BMS.
- Using it to feedback into new and major refurbishment capital development
- Using the feedback to inform:
 - Regulation
 - Standards
 - Practice
- It is coincident with plans for greater automation
- There is so much (questionable?) data becoming available – others might do it **BADLY**



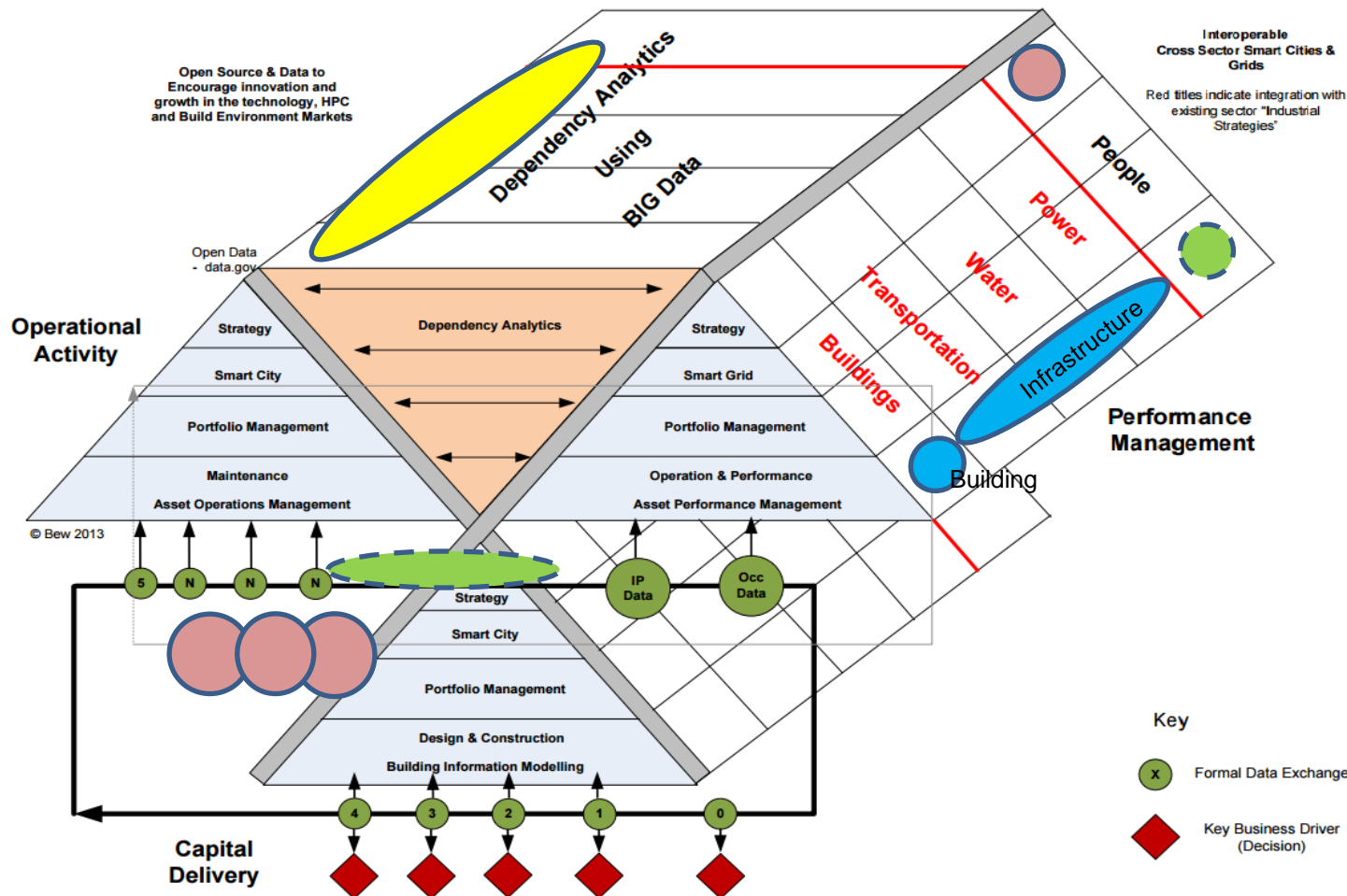
Digital Built Britain Operational Model (BIM level 3)



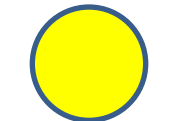
BREEAM Communities



Digital Built Britain Operational Model (BIM level 3) Incorporating present and possible future BREEAM



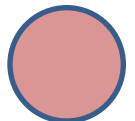
BREEAM schemes key



Communities



New construction or major refurbishment of all kinds



In Use of all kinds



Real Time

Key



Formal Data Exchange



Key Business Driver (Decision)



Environmental assessment over the data horizon:

BIM Its about the Planet
..... the purpose of BIM in improving the performance of the construction industry and building a better world together in a global context.

[illegible]

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So what we need is for the data from BIM, AIM and other sources to help us help you to build that better, sustainable world.

Thank you very much

I hope I have time for questions

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