

Developing from Level 2

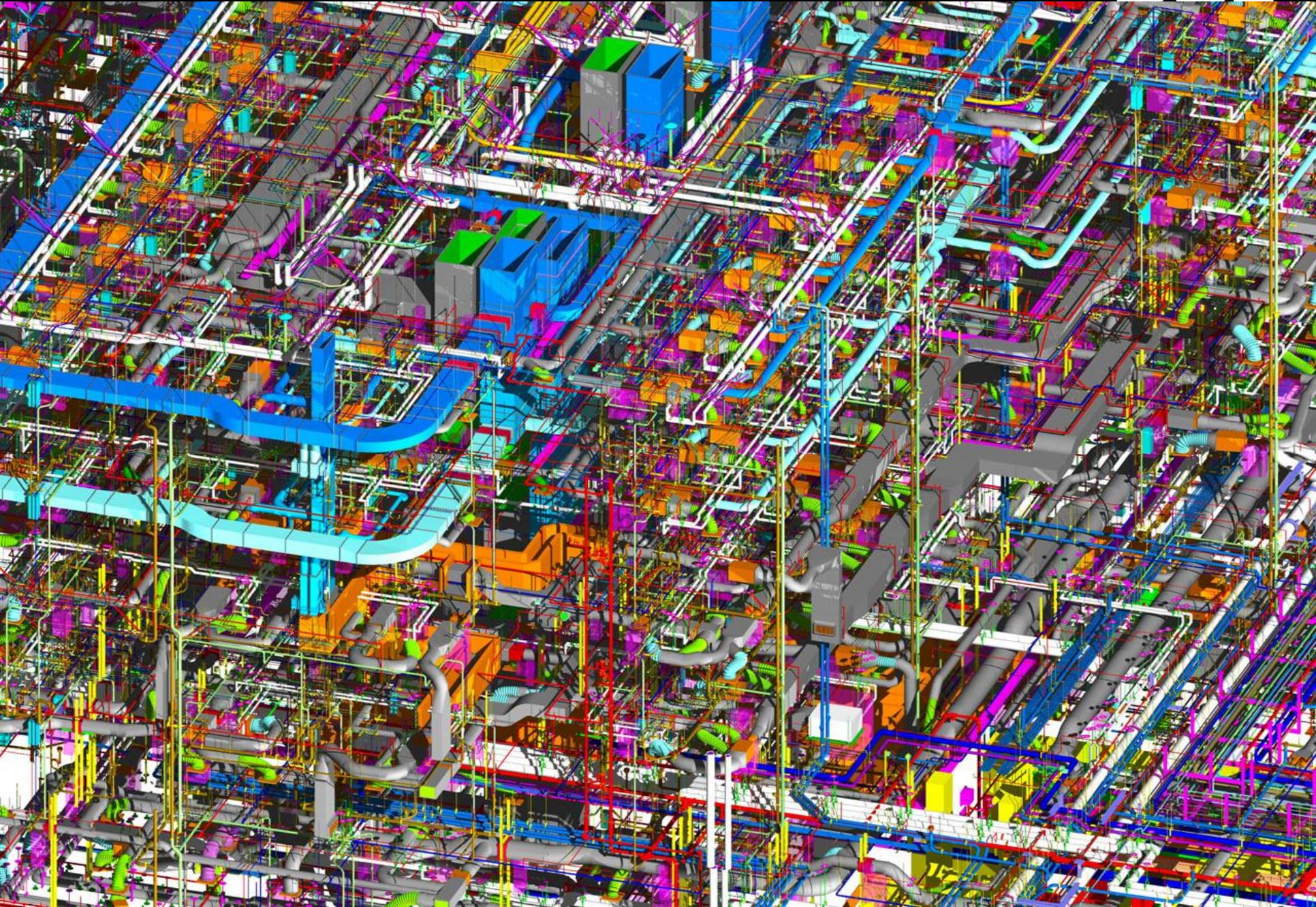
It's BIM folks, but not as we know it

Professor Tim Broyd

Chair in Built Environment Foresight, UCL

Vice President, ICE

thinkBIM, London, 17 September 2014



The logo for the Cabinet Office, which is a stylized crown or crest.

CabinetOffice

Government Construction Strategy

May 2011

2 Strategy Objectives

Modelling (BIM). This will be a phased process working closely with industry groups, in order to allow time for industry to prepare for the development of new standards and for training.

2.32 Government will require fully collaborative 3D BIM (with all project and asset information, documentation and data being electronic) as a minimum by 2016. A staged plan will be published with mandated milestones showing measurable progress at the end of each year.

Progress to May 2011

A Client BIM Mobilisation and Implementation Group to drive the adoption of BIM across government has been established and met for the first time in May 2011, and a staged implementation plan will be published in June.

 HM Government

Industrial strategy: government and industry in partnership



Building Information
Modelling

Our long term ambition is to be a global leader in the exploitation of this technology and increasingly as a supplier of BIM services and software by developing the UK's capability in this area.

To realise this ambition we have developed a three part action plan: The parts are:

- 1) FULLY COMMIT TO THE EXISTING BIS BIM PROGRAMME TO CREATE CRITICAL MASS**

- 2) AIM FOR GROWTH**

- 3) HELP CREATE THE FUTURE BY CONTINUALLY DEVELOPING OUR CAPABILITIES.**

Industrial Strategy: government and industry in partnership



Construction 2025

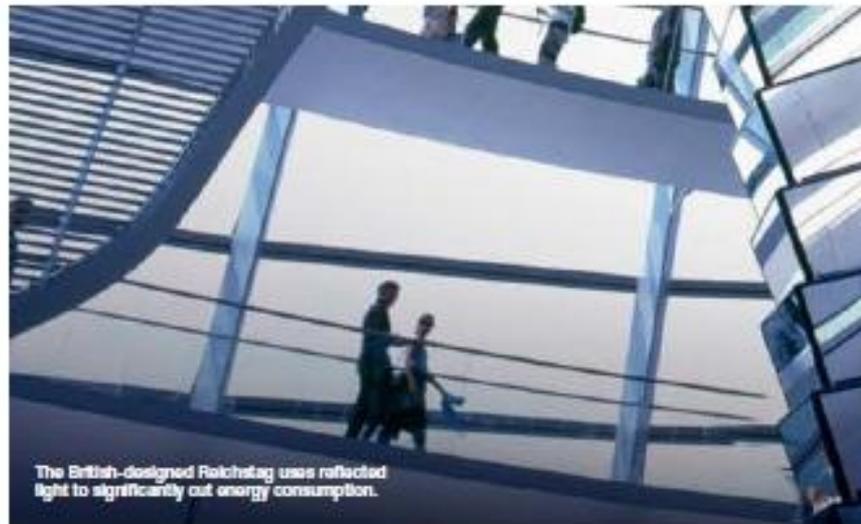
July 2013

Our vision for 2025

Working together, industry and Government have developed a clear and defined set of aspirations for UK construction.

It begins with a clear vision of where UK construction will be in 2025:

- **PEOPLE** An industry that is known for its talented and diverse workforce
 - **SMART** An industry that is efficient and technologically advanced
 - **SUSTAINABLE** An industry that leads the world in low-carbon and green construction exports
 - **GROWTH** An industry that drives growth across the entire economy
 - **LEADERSHIP** An industry with clear leadership from a Construction Leadership Council
- This vision will provide the basis for the industry to capitalise its strengths in the global market.



The British-designed Reichstag uses reflected light to significantly cut energy consumption.

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



The global construction market is forecast to grow by over 70% by 2025.

Global Construction 2025; Global Construction Perspectives and Oxford Economics (July 2013)

Level 2 “Package”

- PAS1192:2 Capital Delivery
- PAS1192:3 Operational Delivery
- BS1192:4
- BIM Protocol
- Government Soft Landings
- Classification
- Digital Plan of Works (Levels of Detail)

"BIM is the first truly global digital construction technology and will soon be deployed in every country in the world. It is a 'game changer' and we need to recognise that it is here to stay - but in common with all innovation this presents both risk and opportunity.

The UK programme based on the BIS BIM Strategy is currently the most ambitious and advanced centrally driven programme in the world. The UK has a window of opportunity to capitalise on the success of its domestic programme and to take on a global leadership role in BIM exploitation, BIM service provision and BIM standards development. In taking on the role it will greatly enhance the global image of UK designers, contractors and product manufacturers which in turn will translate into winning new work, growth opportunities and increased employment.

The comprehensive scope and integrated structure of the current UK programme is also an ideal platform on which to take BIM to the next logical level and aim for a fully integrated BIM - which will bring untold benefits.

The UK has displayed a high degree of courage to embark on the current programme and I, for one would urge that they continue to press ahead on the global stage together with their ambitions to develop BIM to the next level. It is often said that 'fortune favours the bold' and this will have resonance with this endeavour."



Patrick MacLeamy - Chief Executive Officer - HOK Architects

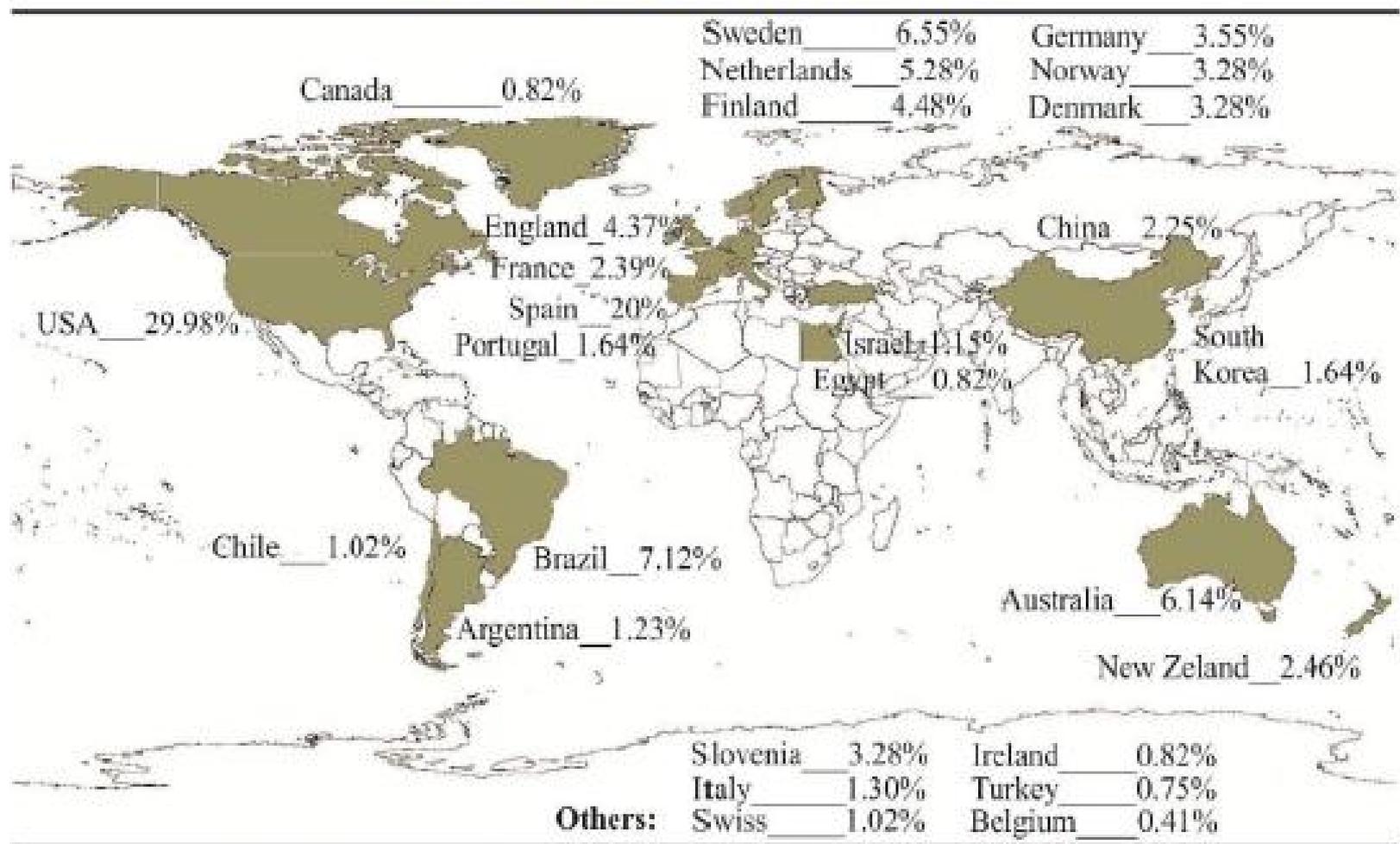


"The progress and leadership of the UK's 'Collaborative BIM' initiative is of such international importance that I am committing to spend several months per year here in the UK to support the advancement of Levels 2 and 3, by way of innovations in information mobility for sustaining infrastructure. This has already become a source of global competitive advantage for this country and its enterprises. The effectiveness of the UK's BIM Strategy can be gauged not only by the zeal to achieve its goals shown by both its own Government and Industry, but also by the consequent international investment drawn here on the part of global businesses such as mine."

Greg Bentley - Chief Executive Office, Bentley Systems

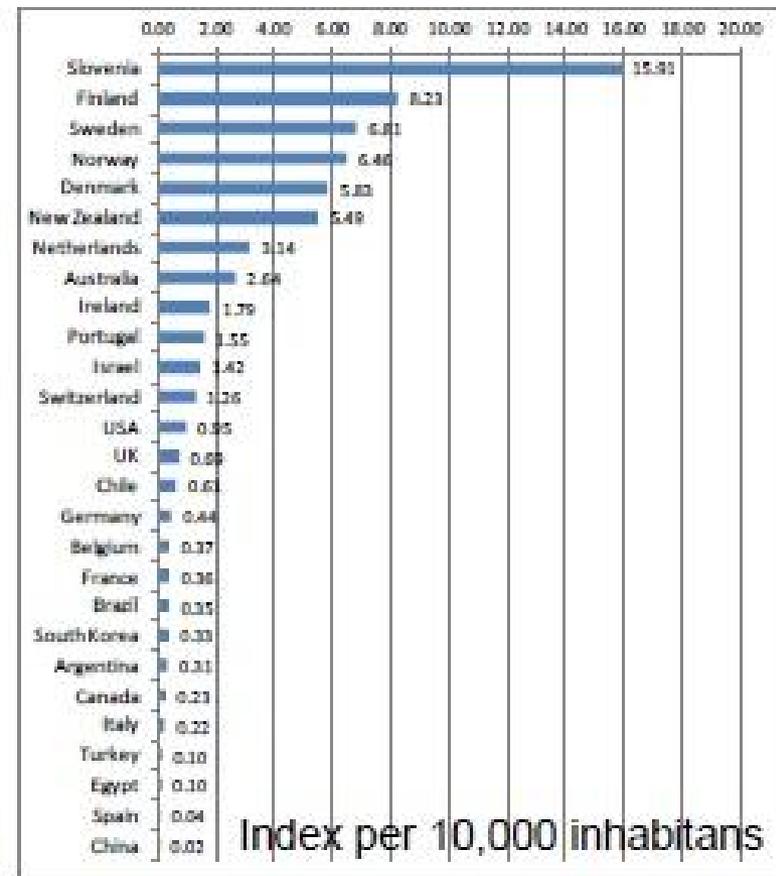
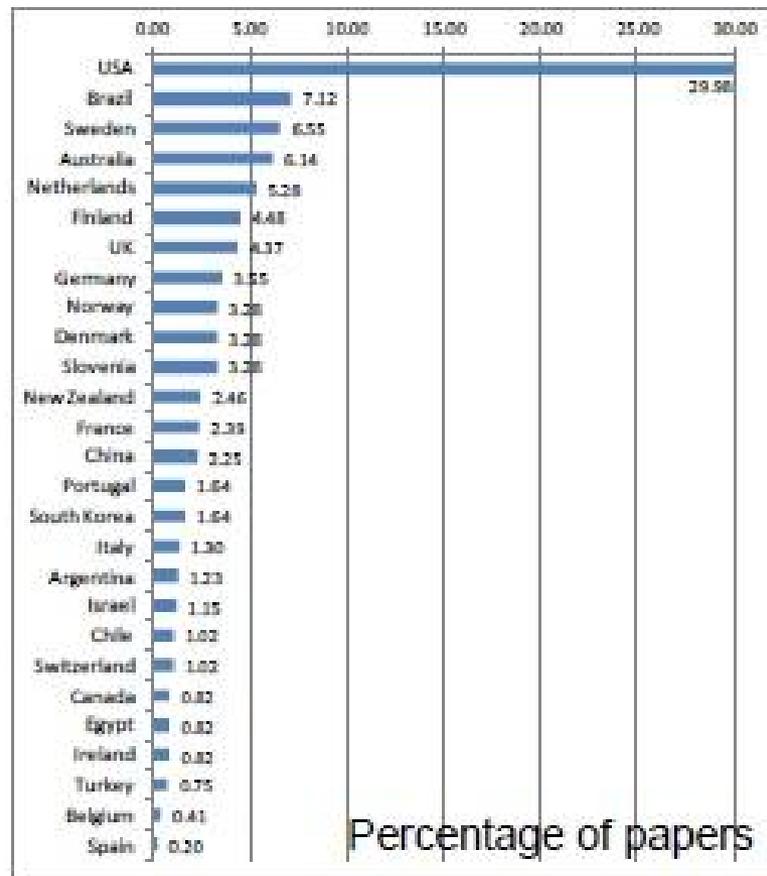


Countries with the largest percentages of BIM publications in international research sources



Source: Carneiro, Lins & Neto: Spread of BIM - A Comparative Analysis of Scientific Production in Brazil and Abroad 2012

BIM publications in different countries



“I reckon 75% of the dissertation students in the built environment have elected to do “BIM” and the market is overloaded with requests”

Government's BIM target unachievable, says Pinsent Masons Survey

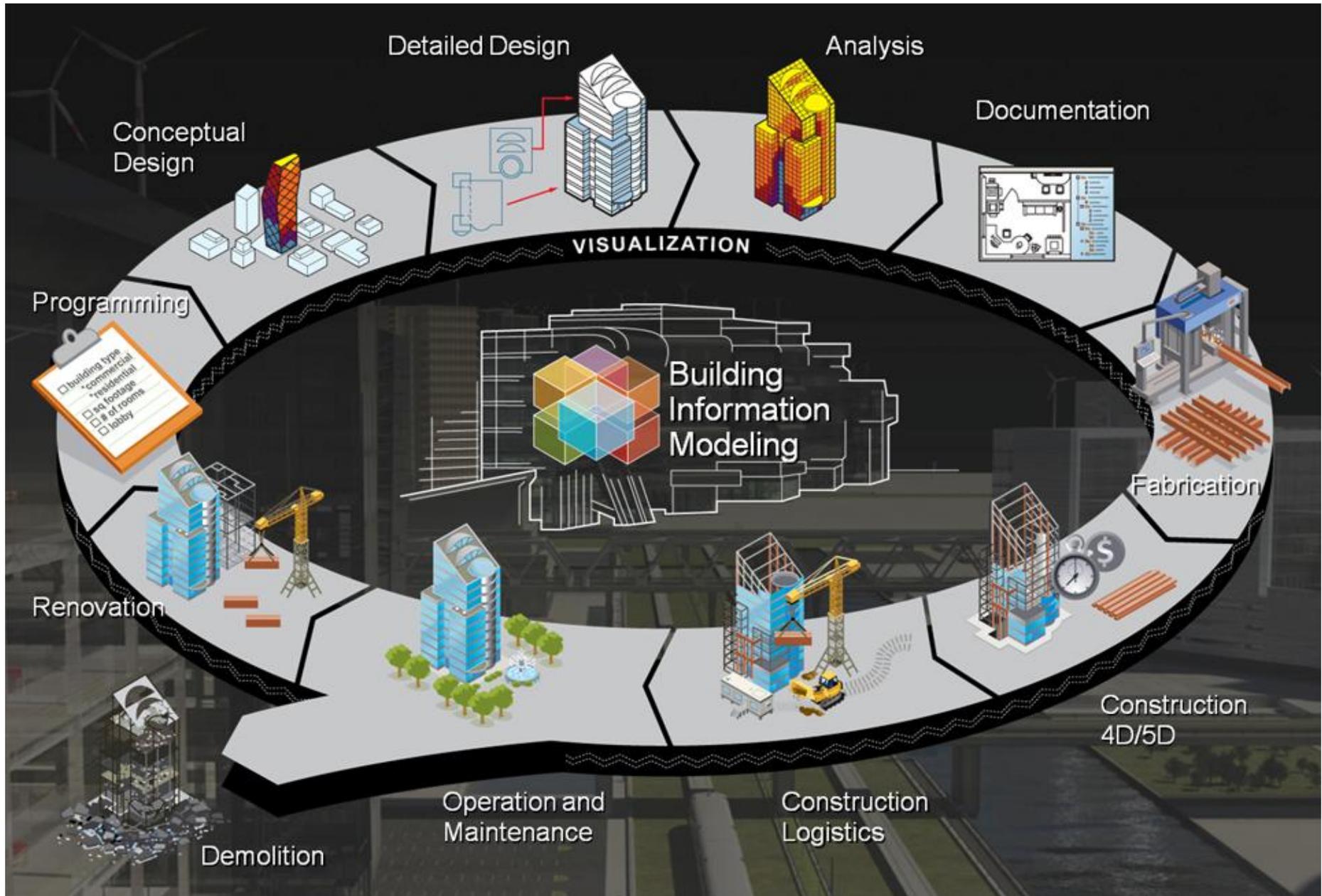
A Pinsent Masons survey into the use of Building Information Modelling (BIM)* in the construction sector found that nearly two-thirds (64%) of construction experts believe that the Government's 2016 target to achieve Level 2 BIM capability on all centrally procured infrastructure projects** is unachievable.

According to the survey, which canvasses the views of experts from 70 organisations across the infrastructure industry, reveals that collaboration is the key to making BIM a success.

The vast majority (94%) of respondents believe that the use of BIM requires a more collaborative approach between the client and construction team, and over a quarter (27%) cite the absence of collaboration as the most significant barrier to achieving Level 2 BIM capability in their organisation.

Chris Hallam, Partner in Pinsent Masons' Projects, Construction and Engineering team, said: "The overriding message from our survey points to greater collaboration if BIM is to be a success. Collaboration is not, however, a new concept for the industry. For over a generation the Government and industry stakeholders have strived to create a utopia of a more collaborative construction industry with some, albeit limited, success.

"The problem is that the majority of construction contracts are not very collaborative. Risk tends to be allocated in a binary manner, with each party incentivised to look after its own interests – rather than the wider interests of a project. Because the parties' interests are rarely aligned, this tends not to create an environment where true collaboration is possible – at least not if things go wrong. BIM, however, by its very nature requires a more collaborative environment."

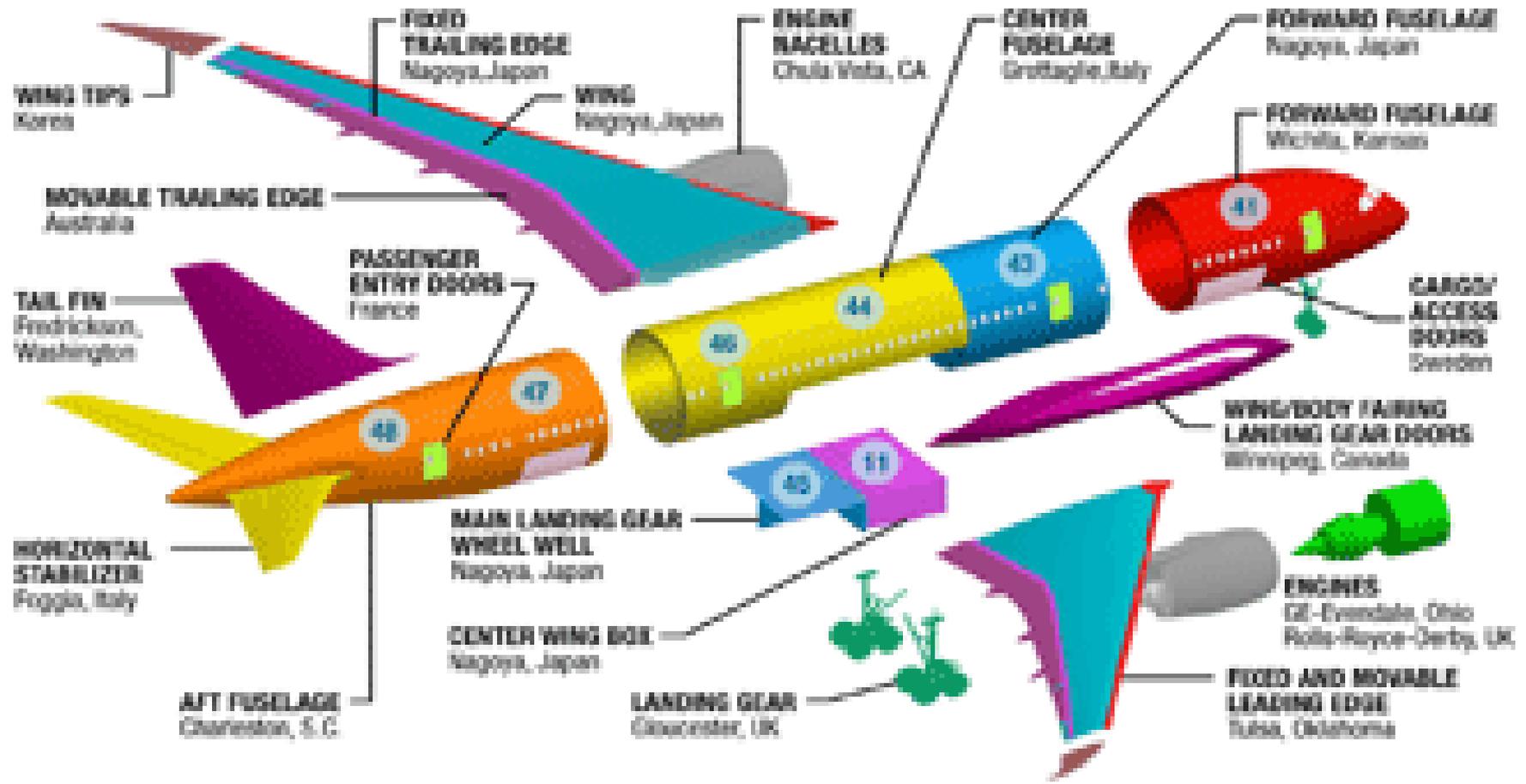






THE COMPANIES

U.S.	CANADA	AUSTRALIA	JAPAN	KOREA	EUROPE
Boeing	Boeing	Boeing	Kawasaki	KAL-ASD	Messier-Dowty
Spirit	Messier-Dowty		Mitsubishi		Rolls-Royce
Vought			Fuji		Lufcocons
GE					Alenia
Goodrich					Saab





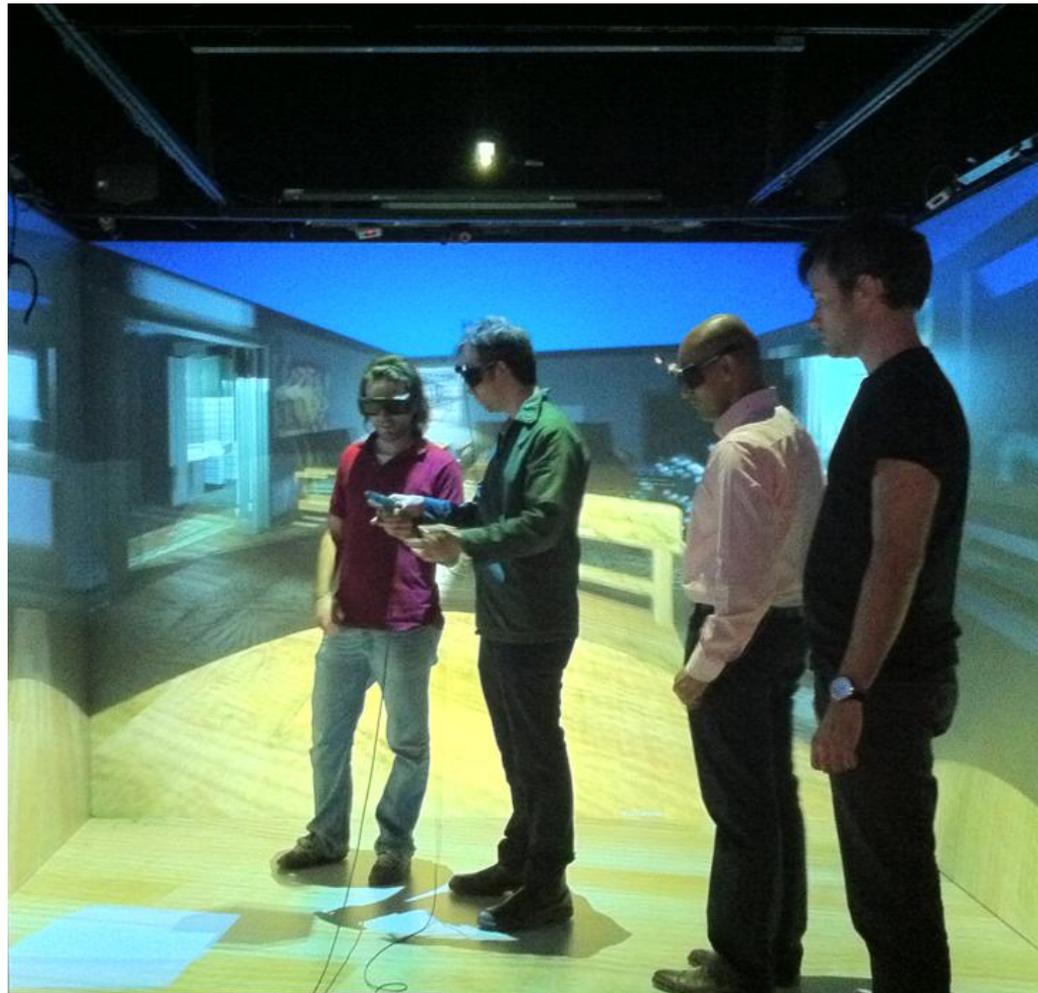
Using 3D printing and scanning methods could notably drop the costs. Sellafield has already used the technique of additive manufacturing to reproduce a new lid for a 40 ton Solid Waste Export Flask, and the financial results are immense. Normally, reproducing this rare lid would have cost about 25,000 pounds, but using 3D scanning techniques dropped the costs to a total price of 3,000 pounds.

In a statement, **Sellafield's Head of Metrology - Alistair Norwood** states: "We're seeing huge numbers of possibilities where we don't have to redesign work."









A detailed 3D cutaway rendering of a futuristic, dark-colored headset. The headset features a large, curved visor and a central display area. A blue power button is visible on the side of the device. The background is a plain, light color.

ADVANCED PRISM DISPLAY



32 1253

MAX SPEED 50 ALTITUDE

12:15 PM



**BUDDY
TRACKING**



Sunday 03 February 2013



The
INDEPENDENT



Last month, Google co-founder Sergey Brin was photographed on the New York subway, sporting what appeared to be a pair of extremely expensive shades.

Now, new details of the eagerly awaited “Google Glass” device have emerged in a test report published by a US regulator. The web search giant’s latest hardware project is an augmented reality headset, which, according to the test report by the Federal Communications Commissions (FCC), plays video and audio to the wearer, and includes a “vibrating element”.

Smart Buildings

“ A smart building is one that doesn't make its occupants look stupid!”

Adrian Leaman, The Useable Buildings Trust

Smart Meters

“ It is not enough to presume that the information from ‘smart metering’ will encourage people to reduce their energy consumption any more than a car speedometer will reduce speeding”

*Stevenson, Leaman, 2010
'Evaluating housing performance in relation
to human behaviour: new challenges'*

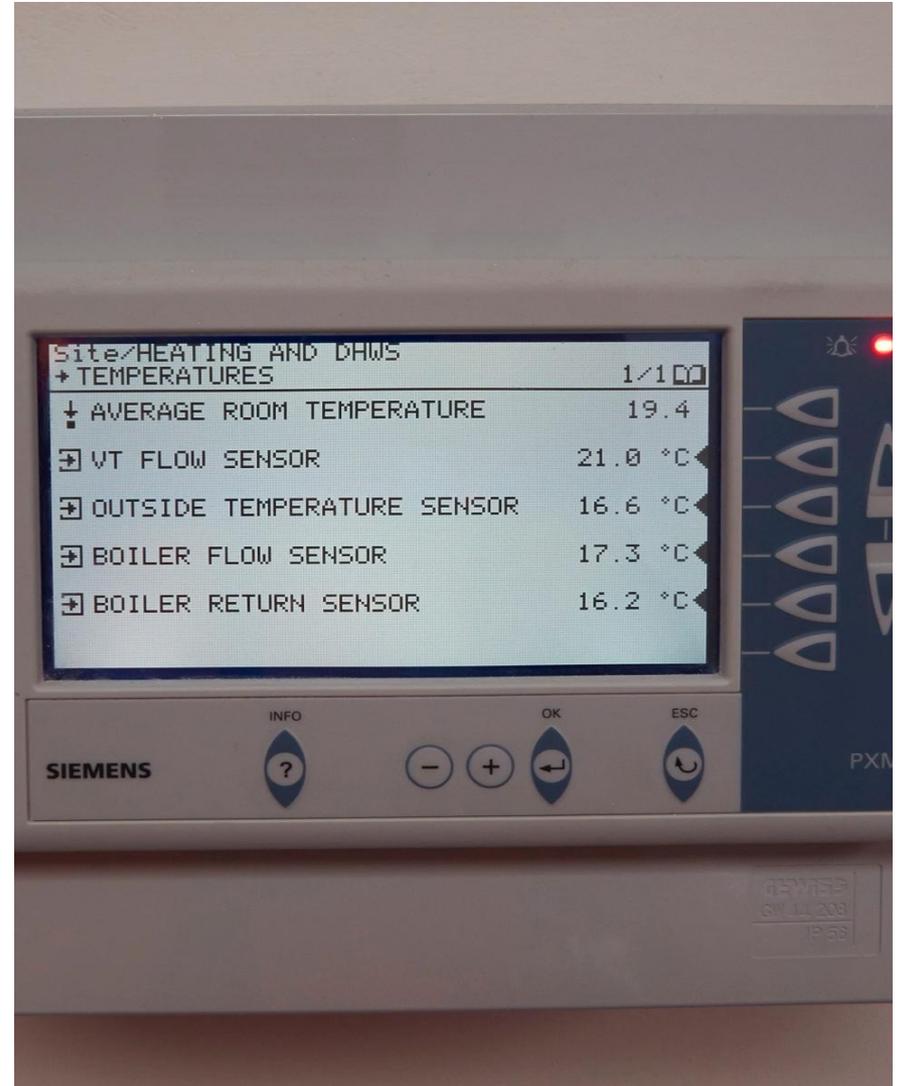
Smart Interface

“ If user controls are ambiguous in intent, poorly labelled, or fail to show whether anything has changed when they are operated, then the systems that lie behind them are unlikely to operate effectively or efficiently”

Bordass, Leaman, Bunn 2007

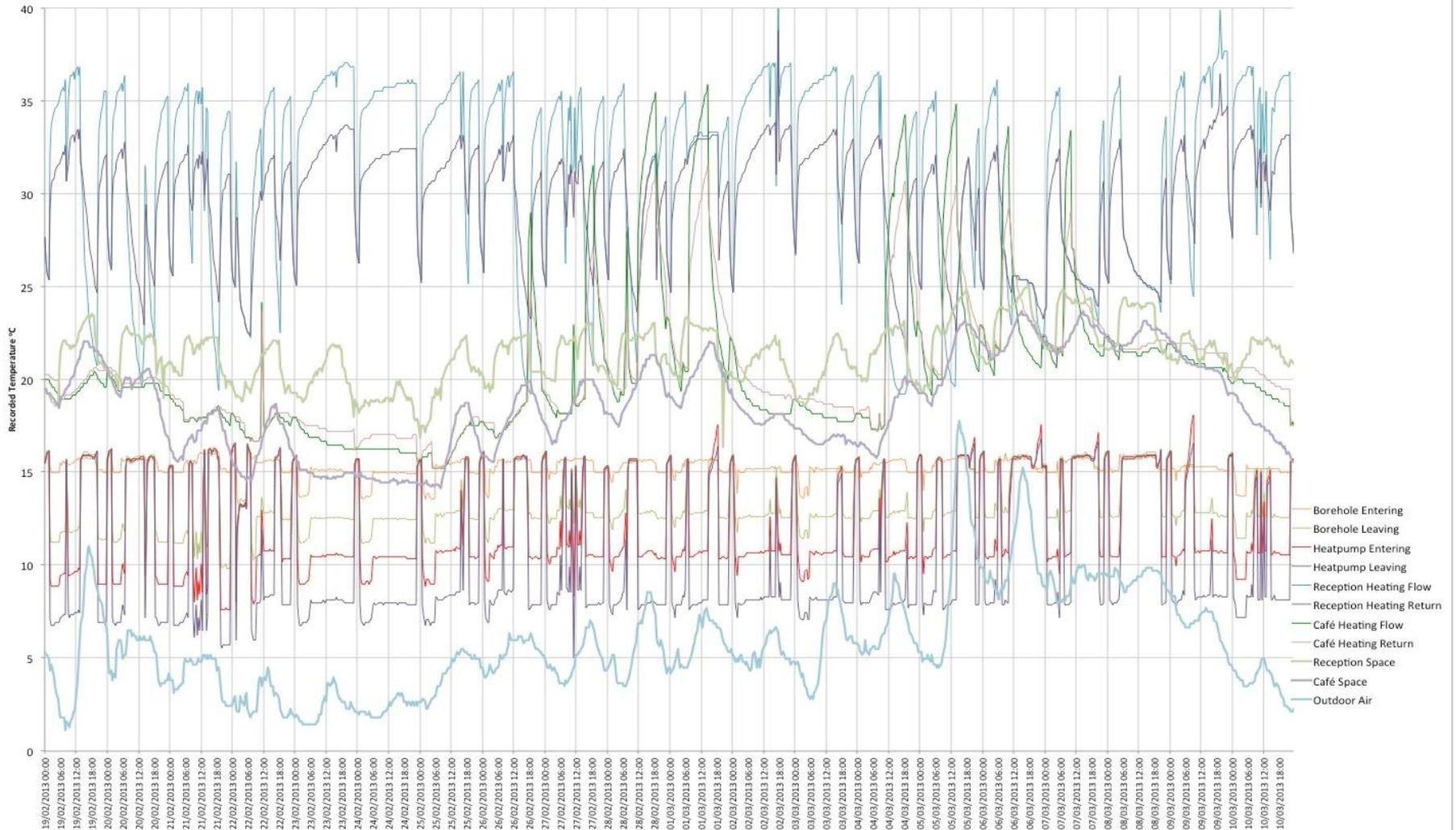
‘ Controls for end users: A guide for good design and implementation’

Smart Interface



Smart or Complex?

Reception / Cafe Heat Pump System Temperatures 19th Feb - 10th March



Smart Becomes Dumb

1997



Smart Becomes Dumb

2013



Smart Becomes Dumb



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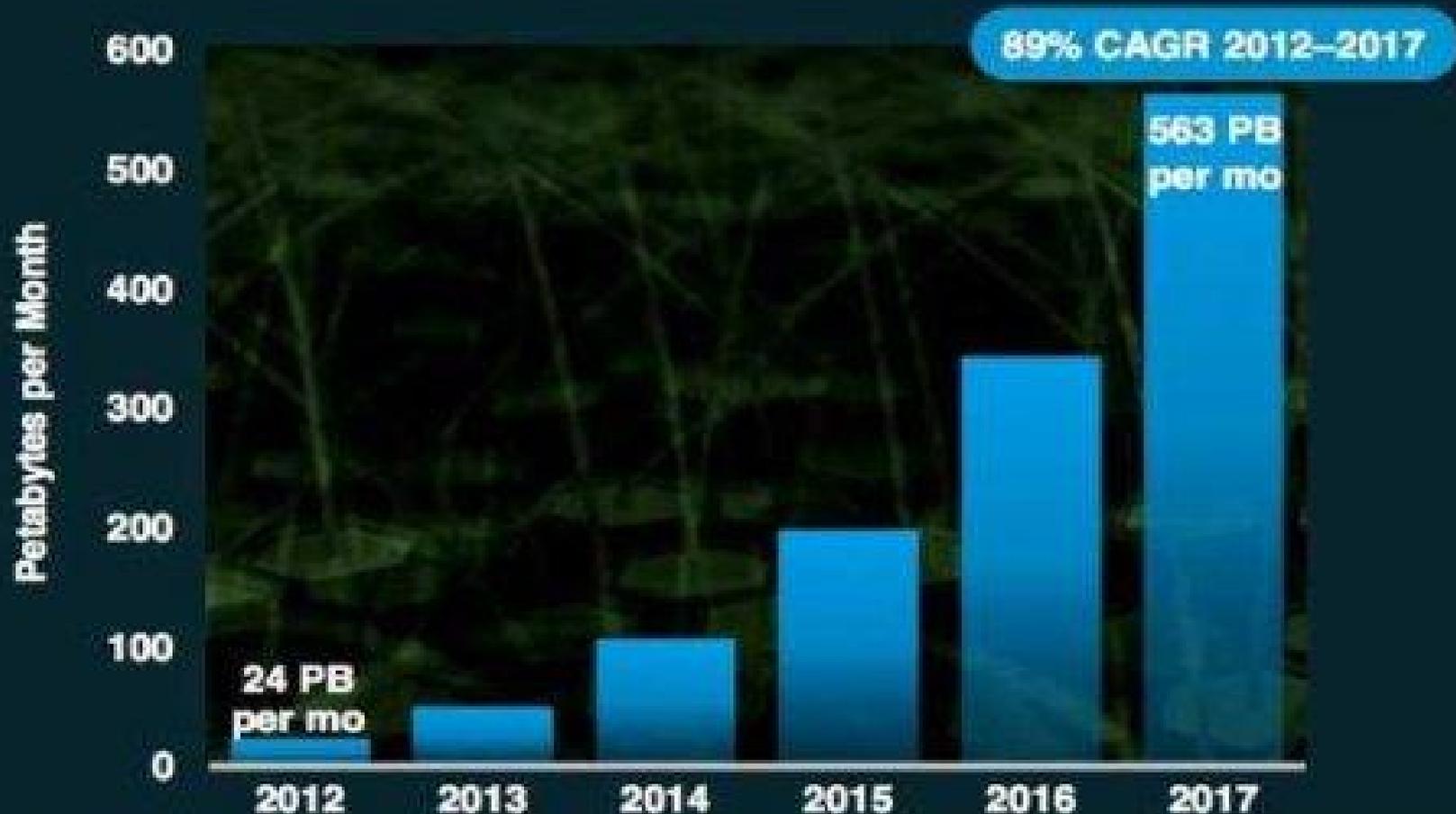
Sign in

Data over the Internet



Machine-to-Machine Mobile Data Traffic Growth

M2M Data Traffic will Increase 24X from 2012 to 2017



Source: Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast, 2012-2017

Apps on the Underground: transforming London's railway



David Waboso

17 September 2014

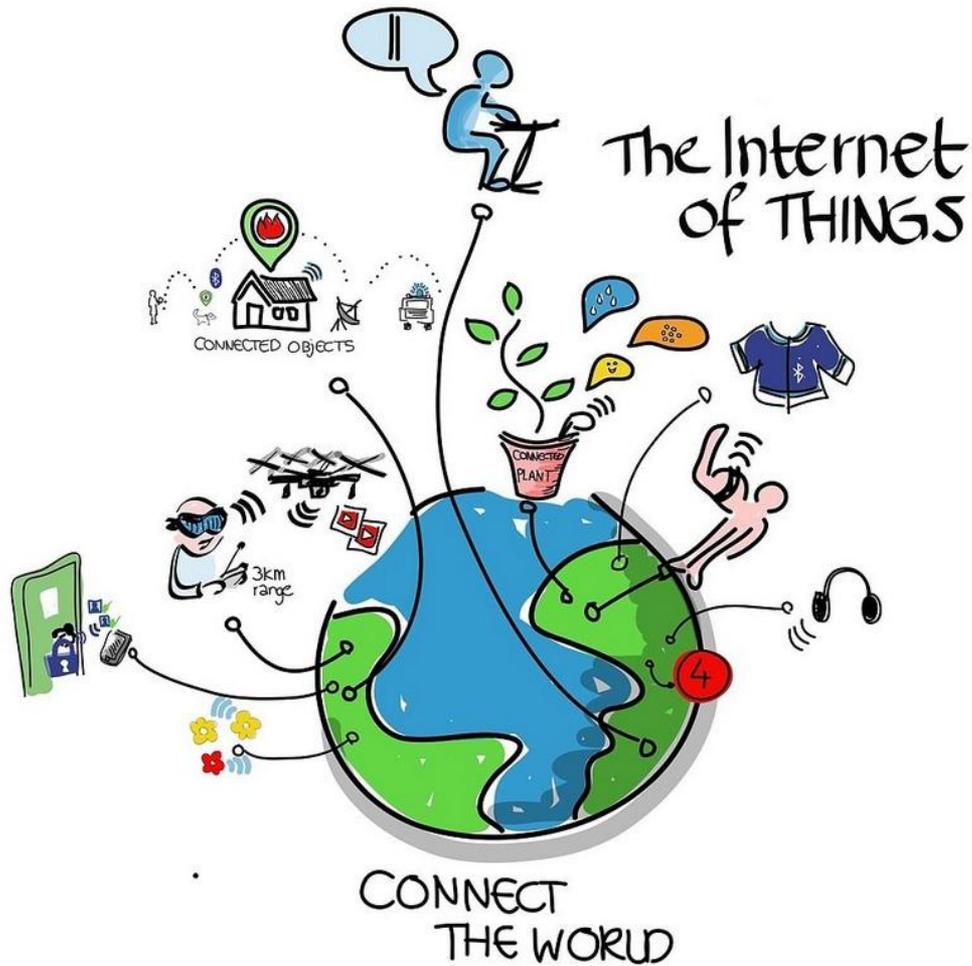


Topics

[Rail](#)

[Innovation](#)

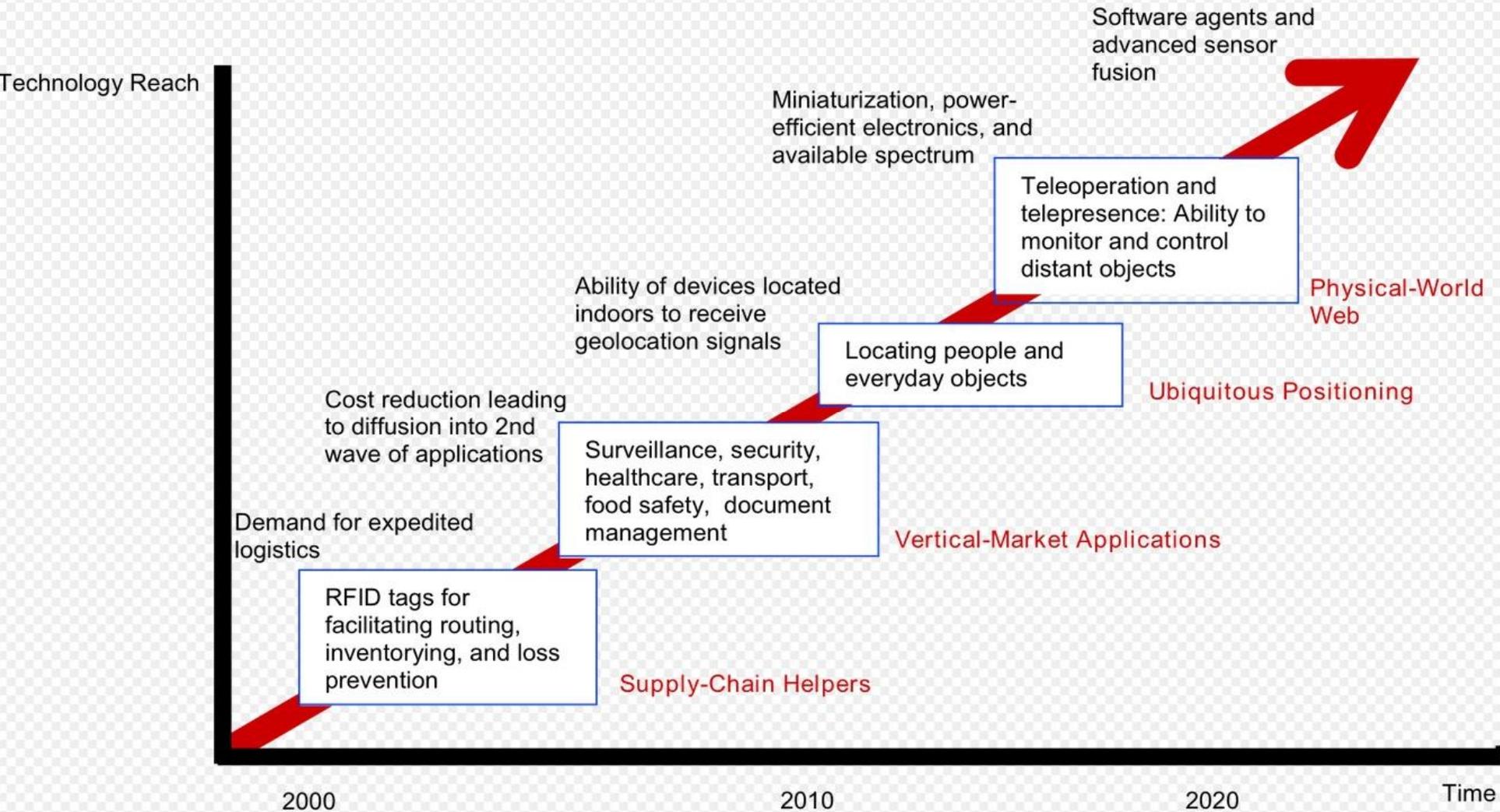
Smart phone apps are allowing Underground engineers to diagnose Tube health niggles before they become a problem. And there's more, says David Waboso.



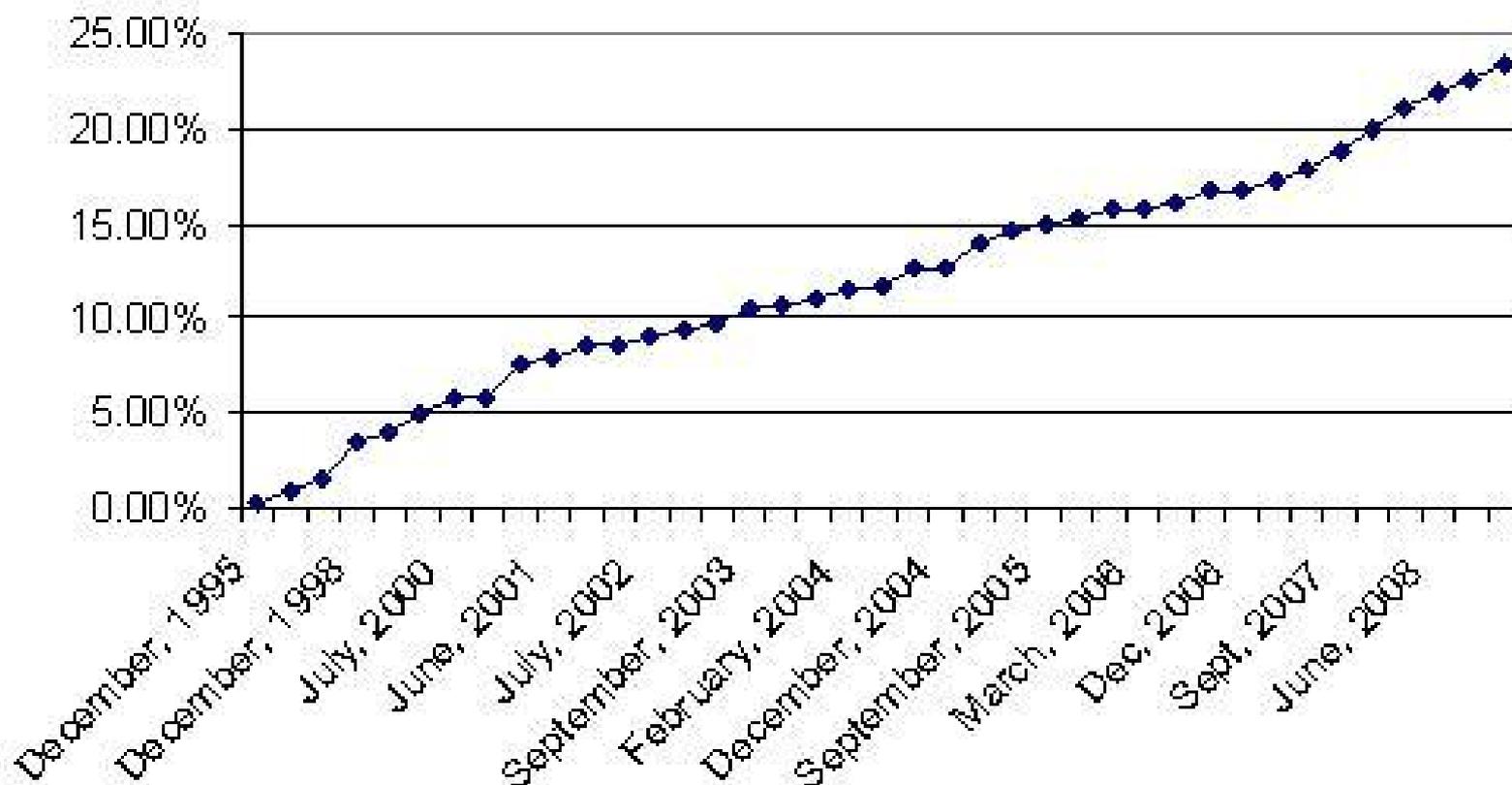
26 billion devices by
2020 – Gartner

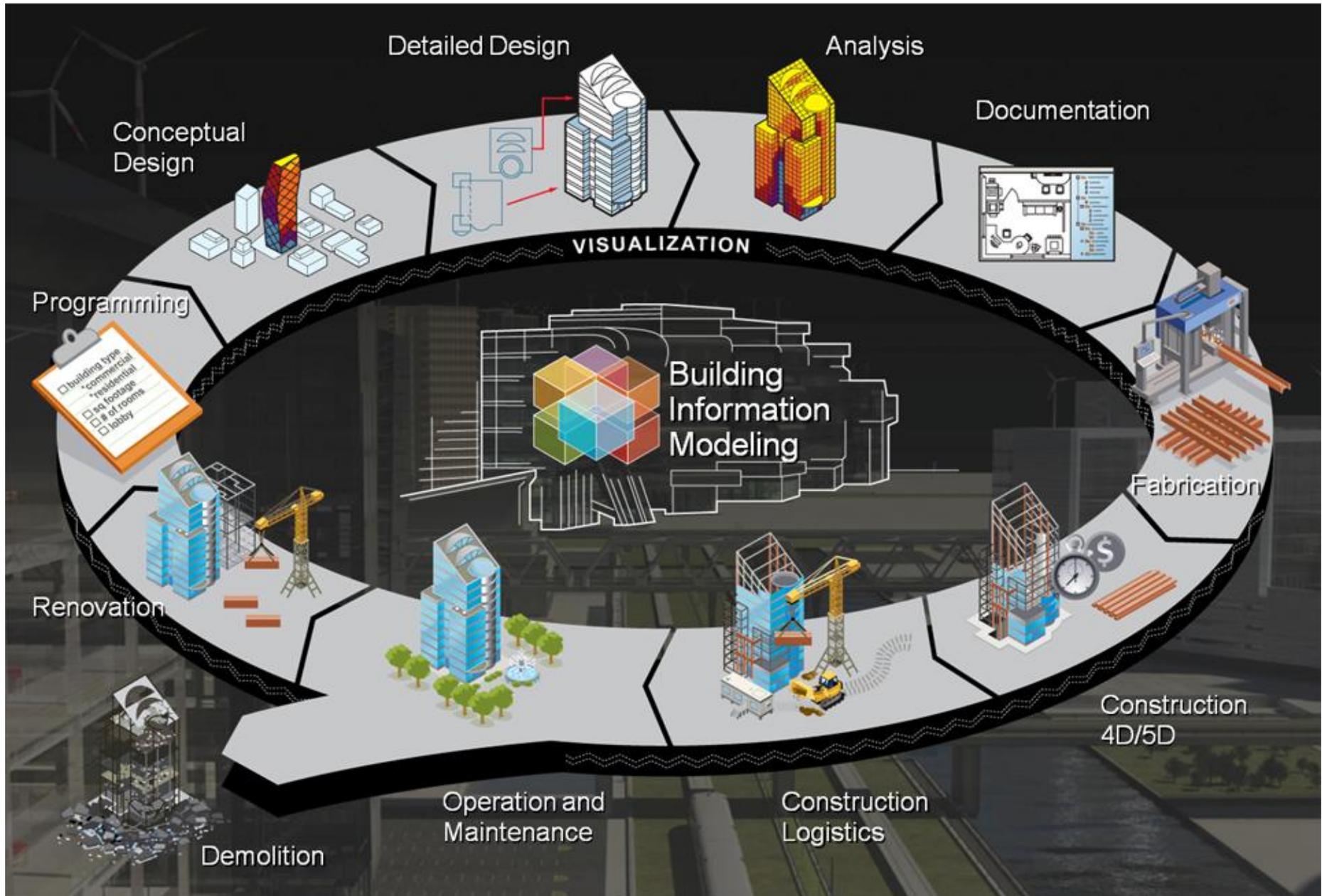
30 billion devices by
2020 – ABI Research

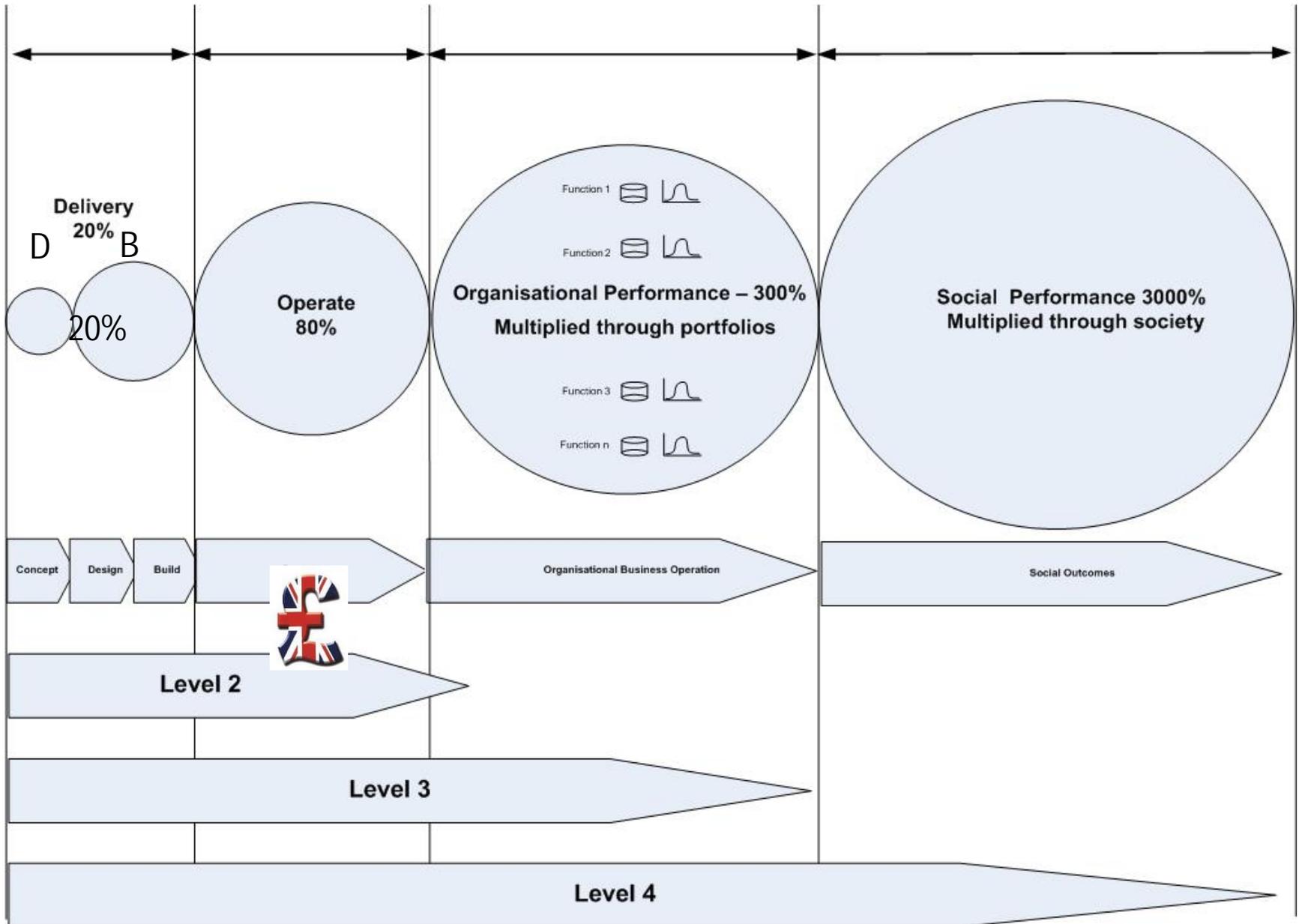
TECHNOLOGY ROADMAP: THE INTERNET OF THINGS



% of world population using the internet since 1995



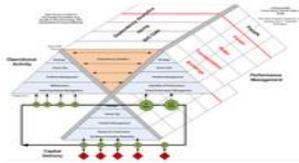




Analysis & Use

Building Information Modelling Geospatial Trending Analytic Dashboards Visualisation Big Data Social Interaction Process Management Operational Systems

Presentation & Methods



- Unified Modelling Language
- Industry Foundation Classes
- Information Delivery Manual
- Model View Definitions
- Classification
- Digital Plan of Work
- Dictionaries and Ontology's
- Construction Apps and Service Store

Storage & Transport

Cloud Technologies, Secure Storage, HADOOP, MAPreduce, Cyber Security, Lustre, Data Cleaning & Access Control, etc

Operating Systems

VxWorks, LynxOS, INTEGRITY, Nucleus, QNX, Linux, Windows (x), Bare Metal

Interface Technologies

USB, Serial Drivers, Networks, TCP/IP, VME/VPX, PCI/PCIe/CPCI, sRIO, L2C, SPI, SCSI, etc

Protocols

LonWorks, ANSI/CEA-709.1-B, KNX, BACnet MODBus, ISO 16484-5, etc

Hardware Solutions



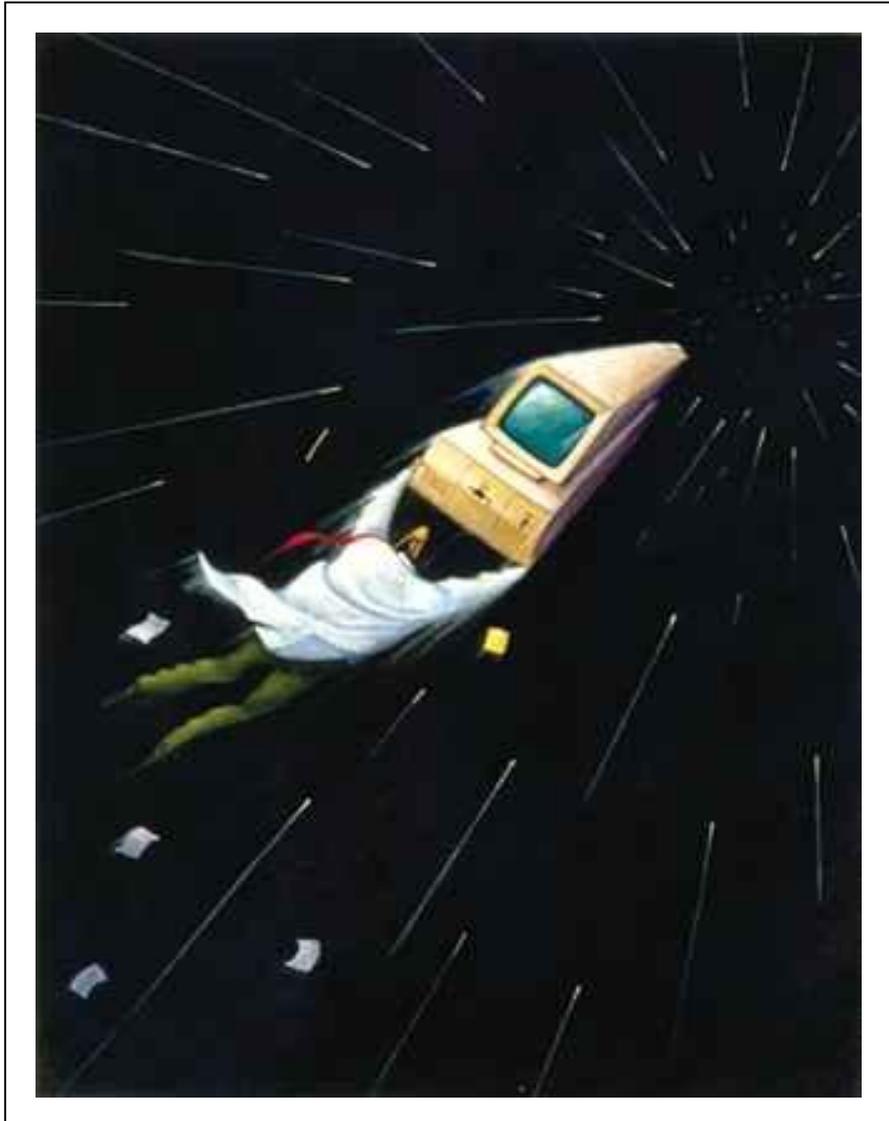
Security
Cyber ISO 27001

Complementary Research

Proposal to EPSRC for a £7.5m, 5 year, fully-funded research programme aimed at harnessing novel forms of sensors, telemetry and Big Data analysis with information structuring techniques from areas such as BIM and GIS. The objective will be to redefine and measure the performance of built environment assets (both buildings and infrastructure), and use the results both to improve the performance of existing assets and to improve the development of new assets.

Research partners:

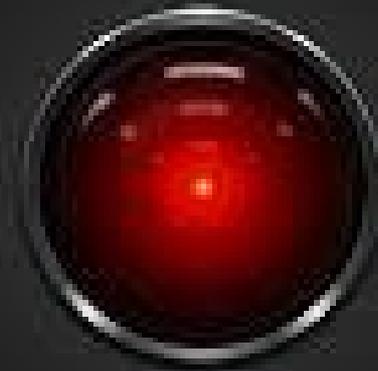
- UCL – The Bartlett Faculty of the Built Environment and The Engineering Faculty
- University of Cambridge – The Centre for Smart Infrastructure and Construction
- University of Reading – The Design Innovation Research Centre

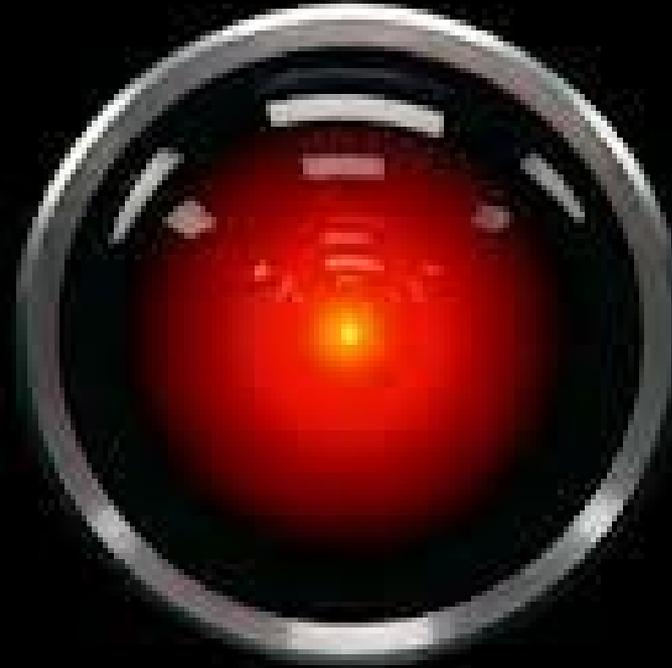


Fox News 30 August 2014: Is there a microchip implant in your future?

“Ramez Naam, who led the early development of Microsoft software projects and is now a popular speaker and author, said he envisions using chip implantation to help monitor the location of people with Alzheimer's disease.”

I think you know what the
problem is just as well as I do





Dave... I'm afraid I can't
let you do that...

SADHILL
TOWNS

Thank you