Supporting the digital transformation of the Built Environment through standards

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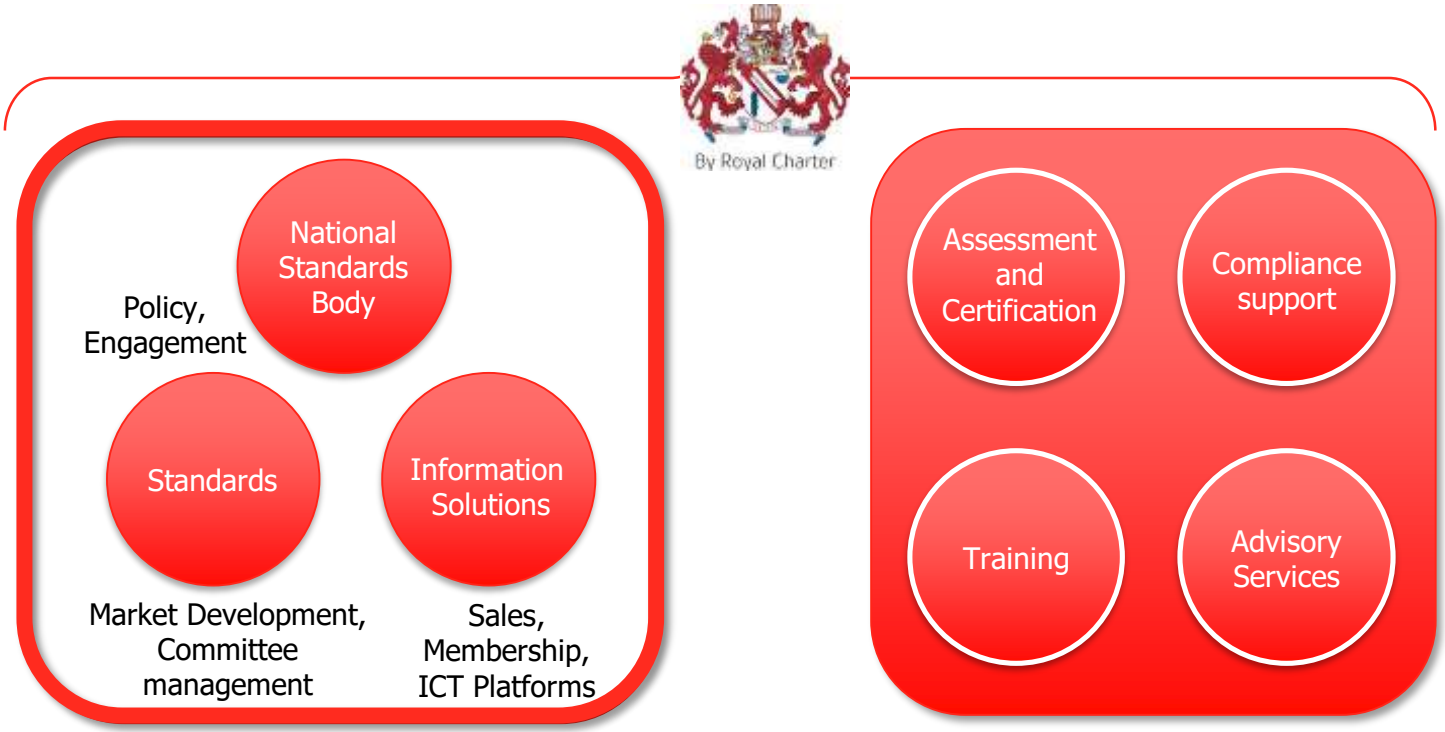
Head of Built Environment, BSI Standards

26th March 2018

BSI Group supporting the digital transformation of the Built Environment through standards

- Introduction to the BSI Group
- The process of developing Standards to support the Built Environment Sector
- Development of Standards to support the implementation of BIM
- Global adoption of BIM Standards
- Opportunities for BIM Standards to support the UAE market
- Future Standards development, including Smart Cities & IoT

BSI Group structure



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The process of developing standards to support the Built Environment Sector

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Standards are made by people for people.

BSI publishes 2,500 and withdraws over 1,000 standards per year, supporting the single standard model wherever possible.

This maintains a coherent, consistent body of knowledge for the entire sector.

BSI is a neutral facilitator for industry experts.

For BSI, standards are a consensus of what good looks like.

The role of consensus knowledge in accelerating innovation

Standards managed by BSI provide:

- A forum for stakeholder consultation and shared understanding under independent governance,
- Access to leading industry knowledge in a dynamic and regularly revised format,
- Increased confidence in the commercialisation of complex or novel technologies,
- Connectivity to rapidly evolving supply chains,
- Rapid global reach to engage with international and European practice,
- No IP barriers or risk of technology lock-in,
- A channel to build public and investor confidence in new technologies and products.

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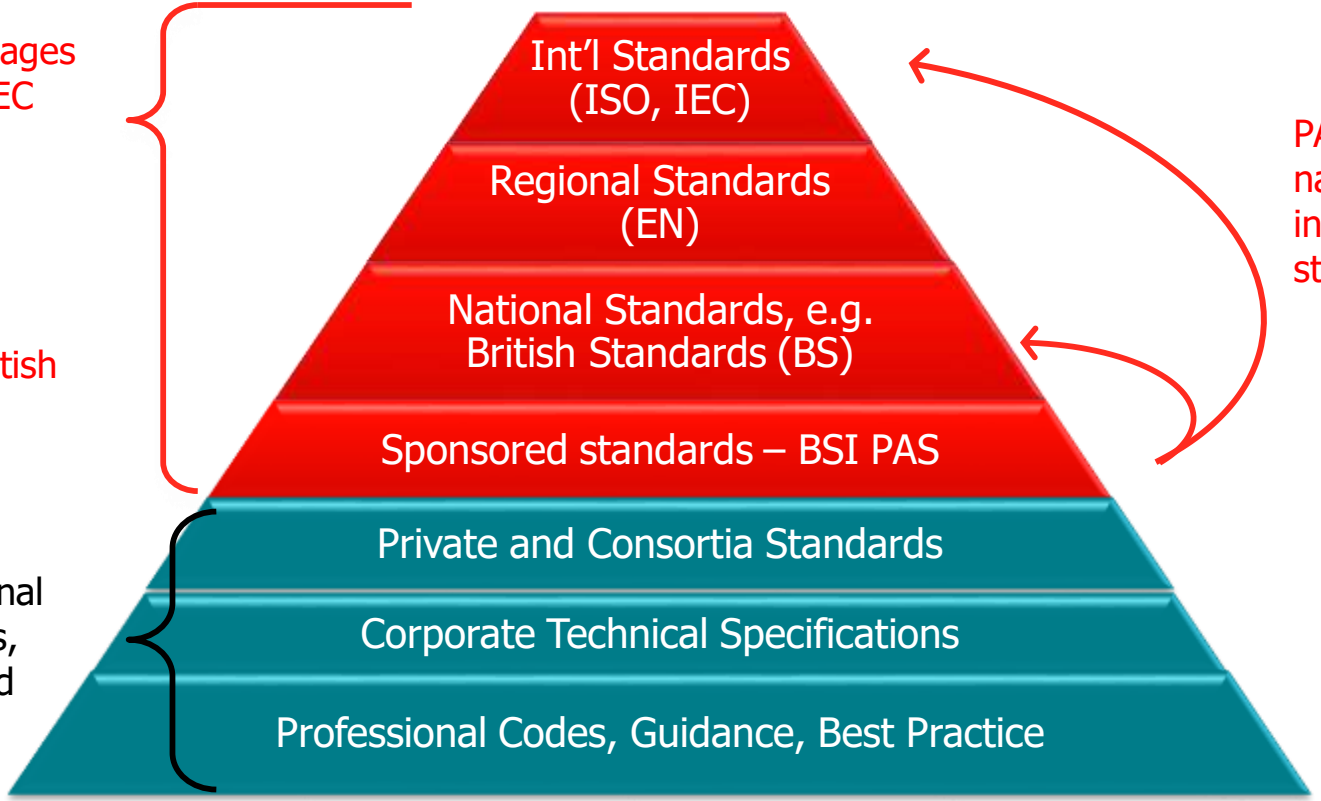
National, European and International standards

BSI as NSB manages BS, EN & ISO, IEC standards.

All EN and most international standards are "adopted" as British Standards



PAS route to national and international standards

Private & professional standards, codes and guidance

How do we make our standards?

idea

Feedback and new proposals

Stakeholder 'community'

Committee drafting

Public consultation

Review comments

Consensus

Publish and support

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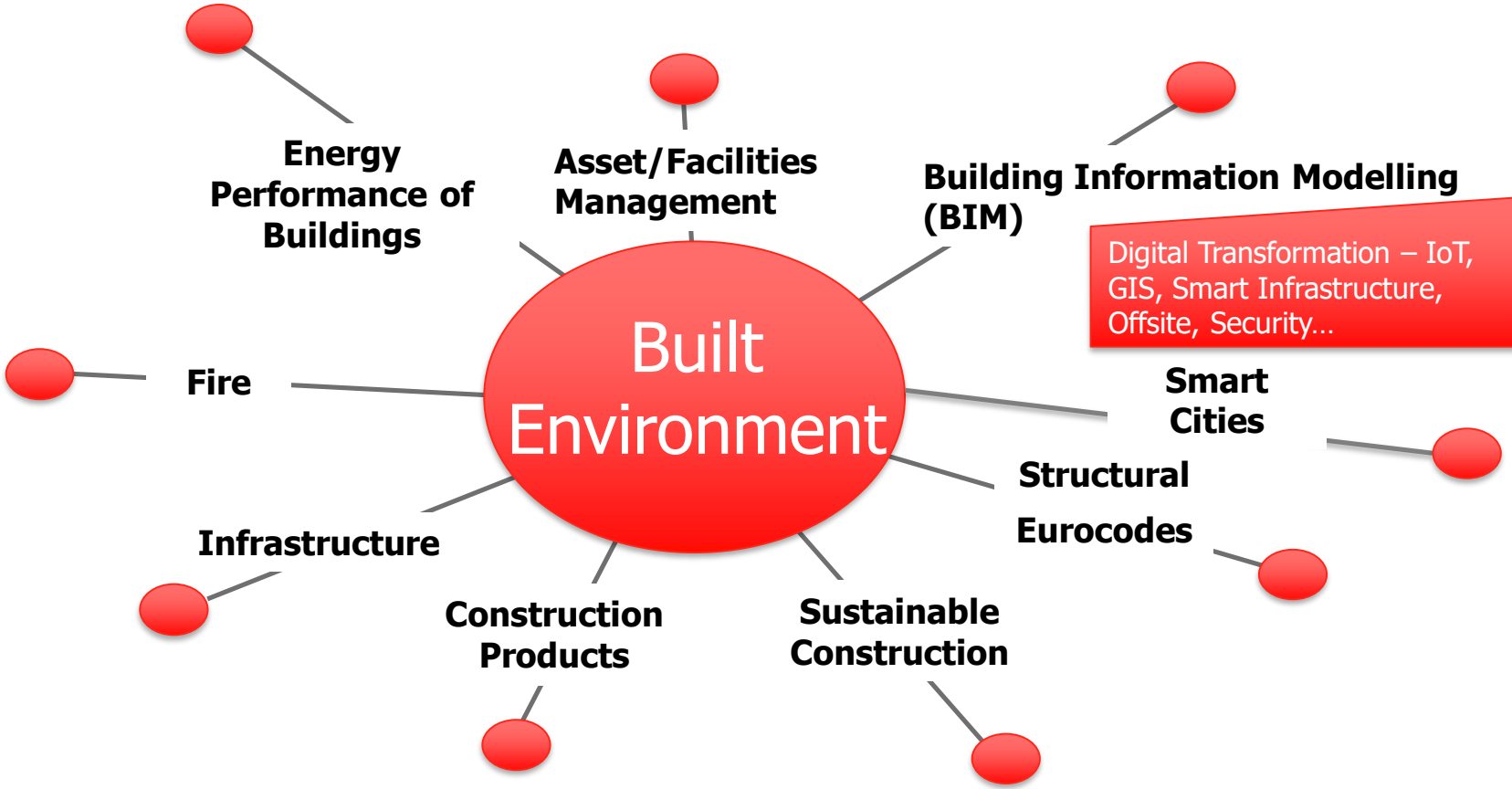
Built Environment community.

Clients • Designers • Constructors • Manufacturers • Operators

How do we define the Built Environment?

'The Built Environment encompasses all forms of **buildings** … housing, industrial, commercial, hospitals, schools … as well as civil engineering **infrastructure** both above and below ground and the **urban space and landscape** between and around buildings.'

Built Environment standards landscape



Development of Standards to support the implementation of BIM

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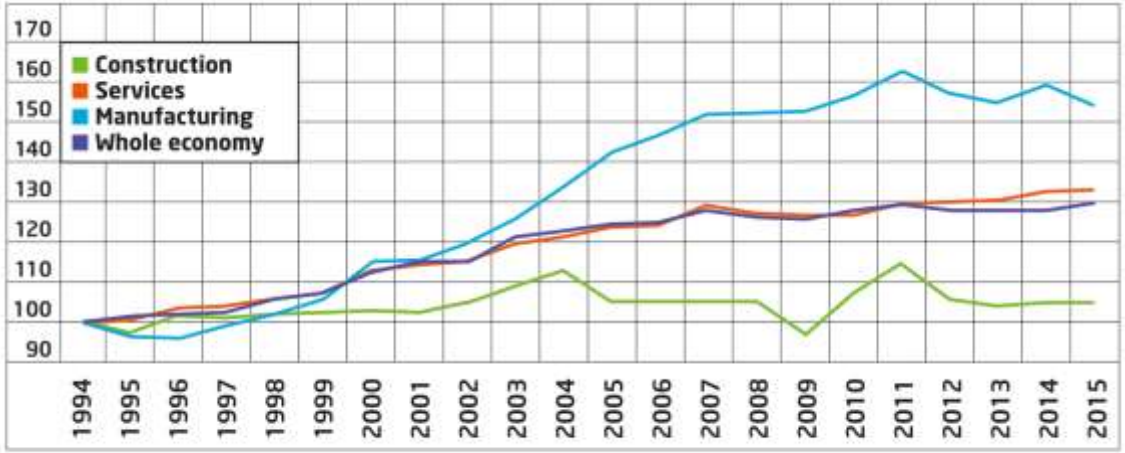
So, what was the problem?

Not that long ago it wasn't uncommon for our new assets to be drawn 2.5 times, and constructed 1.5 times…



Source: ONS. Index adjusted to 1994 = 100

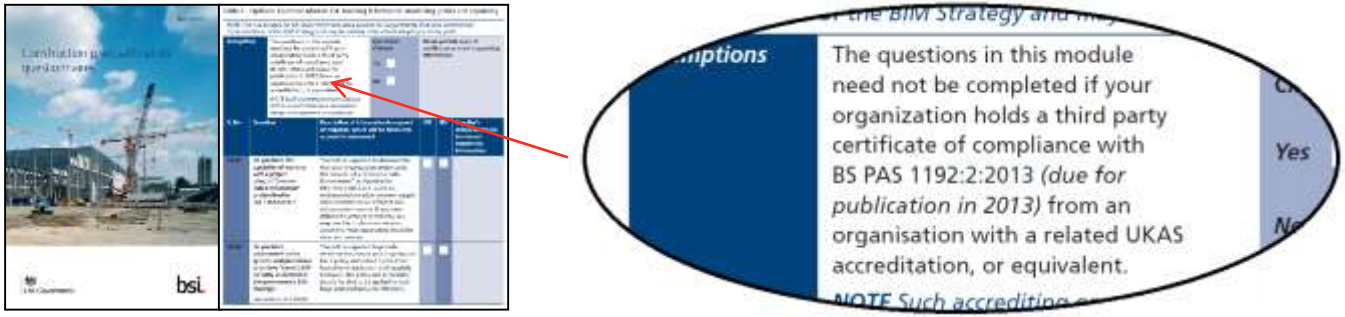
= poor value, and poor productivity - and that was just the construction phase…

UK Market Driver

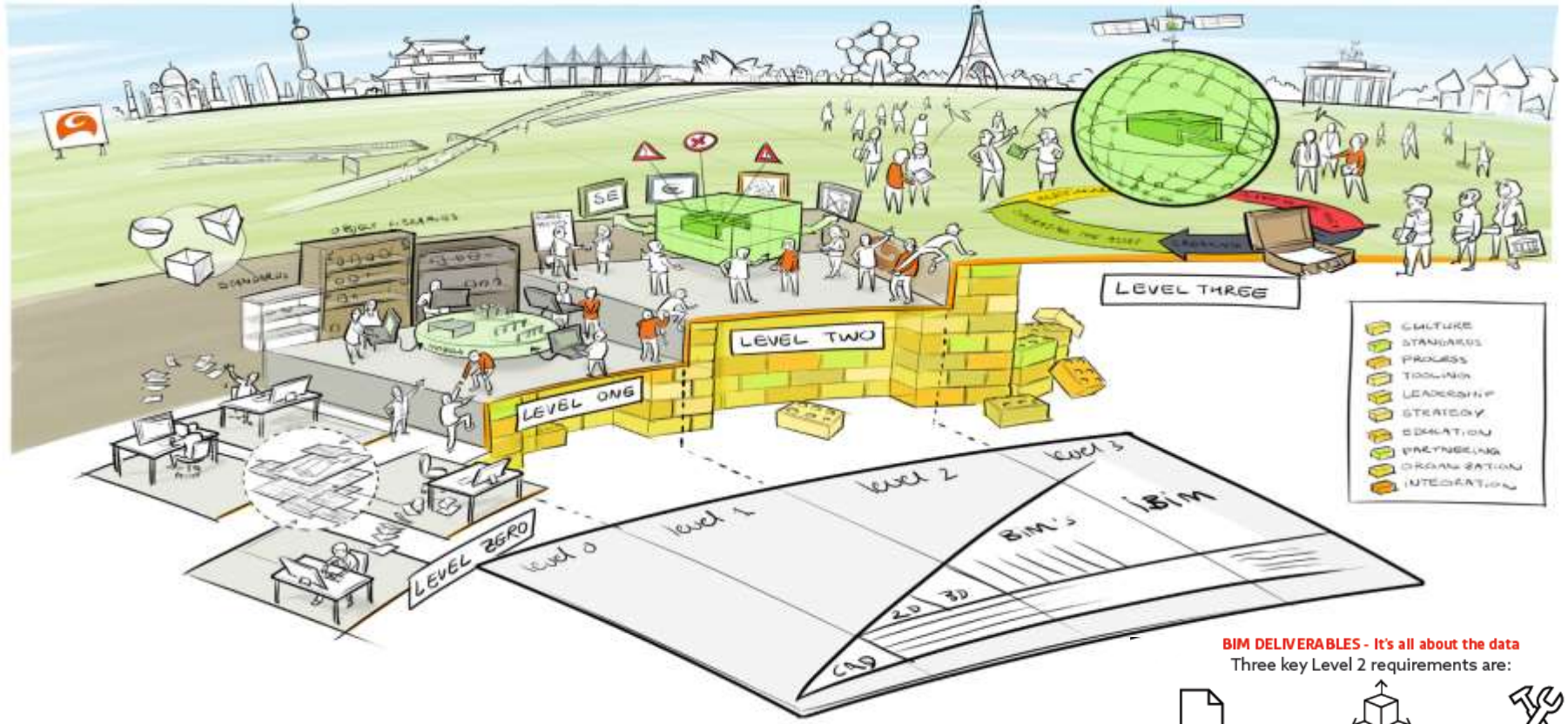
Since April 2016, all centrally procured Government construction should be carried out to BIM Level 2:

"Government will require fully collaborative 3D BIM (with all project and asset information, documentation and data being electronic) as a minimum by 2016."

The way in which BIM readiness is judged is through a pre-tender pre-qualification questionnaire (PQQ): PAS 91 (Table 8)



The UK BIM Maturity Model - Level 2: Managed 'Collaborative' 3D environment



BIM DELIVERABLES - It's all about the data

Three key Level 2 requirements are:

PDF

2D reviewable PDF design deliverables cut from the models

Individual 3D domain models in native file formats

COBie data

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Source - Arcadis

But what is BIM?

Building Information Modelling (BIM) is a collaborative process that seeks to add value throughout the life-cycle of an asset.

A BIM process sees the creation, collation and exchange of shared 3D models - and a range of intelligent, structured data - with the aim being to improve productivity and reduce waste.

Defined Information requirements

Collaborative working practices

Data exchange and validation

Security Minded digital working

Better outcomes & end user value

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part technology - part process - part culture shift

The benefits of BIM

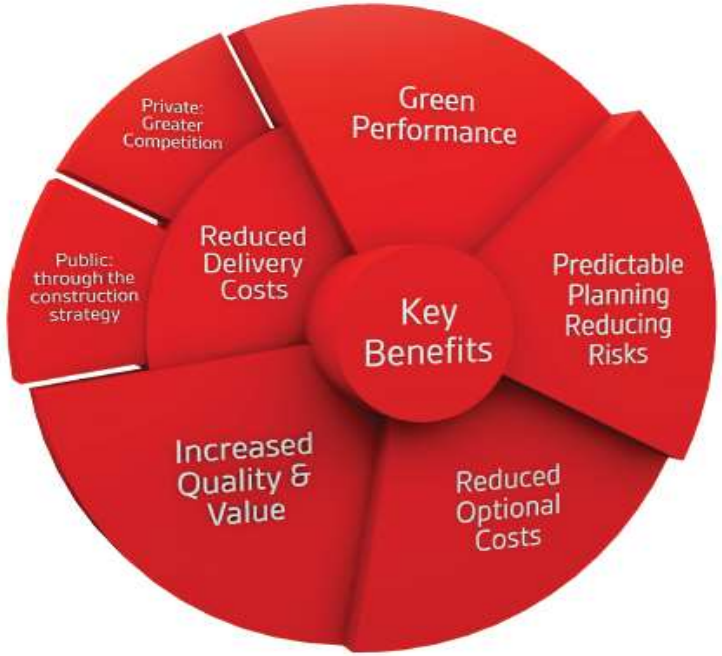
Client

- Lower costs
- Faster delivery
- Lower emissions
- Better customer services
- Risk management

Constructors

Contractor/Subcontractor, Fabricator & Supplier/Manufacturer

- Sequencing
- Clash detection
- Reduced abortive work
- Off site manufacture
- Competitive export & growth
- Health & Safety



Designers

Designers, Specifiers & Cost consultants

- Improved coordination
- Visualisation
- Better cost estimating
- Competitive export & growth

Operators

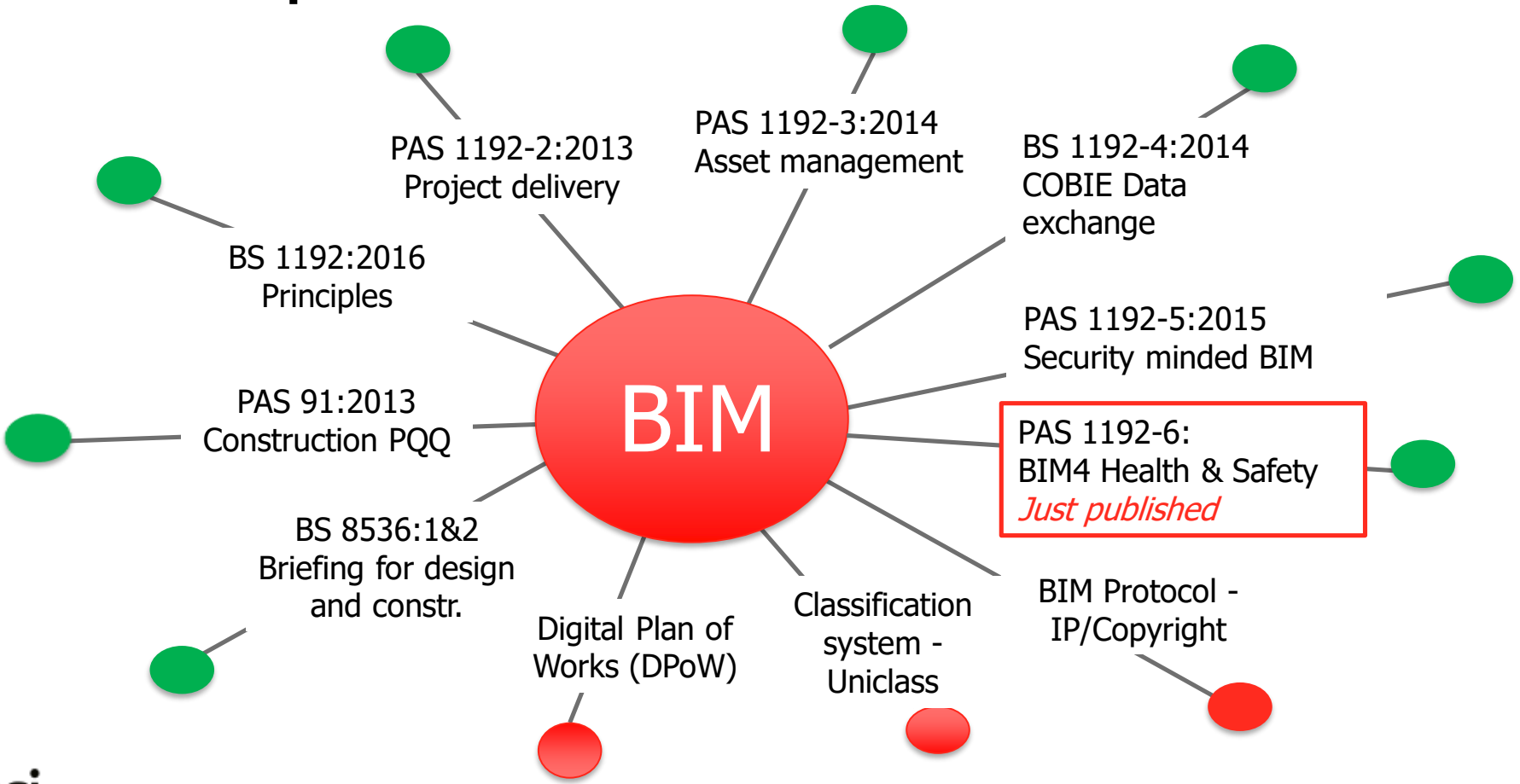
Facilities Manager & Occupier

- Asset knowledge
- Better information
- Soft landings

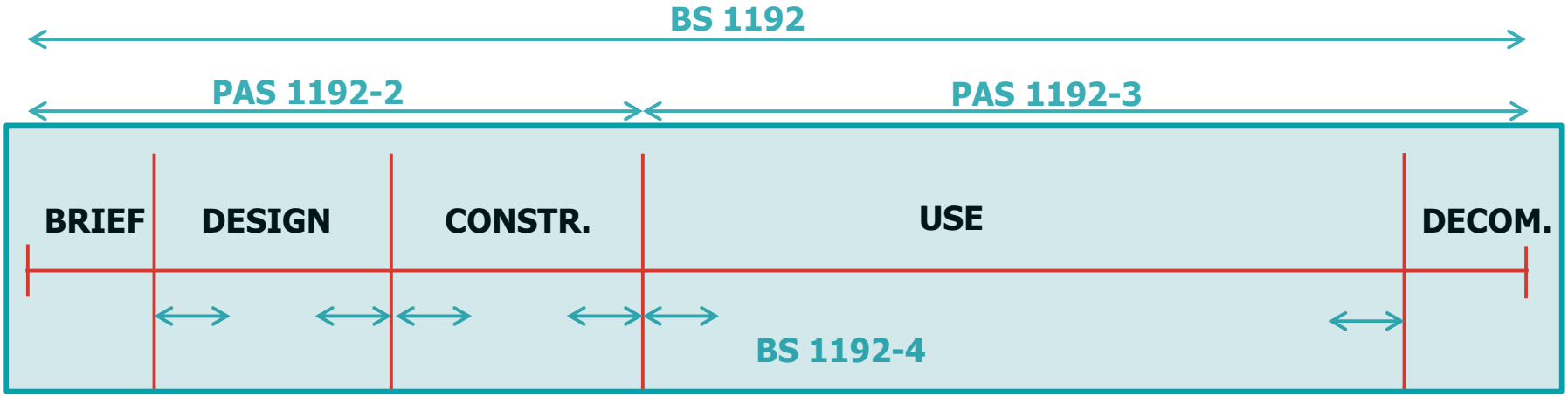
Additional benefits:

- High levels of collaboration
- Consistent and coordinated designs
- Highly constructible design solutions

Essential Components



Applying BIM throughout the asset lifecycle



PAS 91 BS 8536 PAS 1192-5

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Introducing BIM 4 Health & Safety – PAS 1192-6:2018

PAS 1192-6 sets out a model process of how digital health and safety risk information should flow through every stage of a construction project, focusing in particular on the needs and perspective of the end user

It specifies how H&S information can be used in order to:

a) Provide a safer and healthier environment for end-users
b) Mitigate the inherent hazards and risks across the asset lifecycle
c) Result in improved construction H&S performance, fewer incidents and associated impacts
d) Provide for clearer and more relevant H&S information to the right people at the right time
e) Reduce construction and operational costs

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Global BIM Standardization

Committee: ISO/TC 59/SC13 Construction works information
ISO 19650-1 BIM Concepts and principles (2018/19)
ISO 19650-2 BIM Delivery phase of assets (2018/19)
ISOs based on PAS 1192-5 (Security) and PAS 1192-3 (Opex) confirmed

Committee: CEN/TC 442 Building Information Modelling
Adopts ISO/IECs i.e. EN ISO 19650?(TBC)
Develops ENs to complement ISO/IEC
4 new work items being developed in CEN – LOD and PDT's.

Committee: B/555 Construction design, modelling and data exchange
Coordinates UK input into CEN an ISO
Develops BS and PAS
Adopts ENs and ISOs

Innovation in Building Information Modelling (BIM)

- Official BIM Level 2 Hub, provides guidance aimed at the UK and international markets,
- International chapters to be translated into a number of languages, including Arabic and Chinese,
- 145,000+ copies have been downloaded of the standards since 2013 (~20% from outside UK),
- Our standards are being utilised all over the globe including UAE, Australia, Germany, Netherlands, Belgium, Spain, Romania, Russia, Chile

www.BIM-level2.org

But where is digital transformation taking us?

Creation of markets for data analytics

Extension into asset performance

Integration across portfolios of assets

Use of performance data to optimise operation

Feedback of performance into design and assembly

Creation of a hierarchy of data for different purposes

Greater emphasis on Asset Operation

Development of BSI's Smart City and IoT Standards

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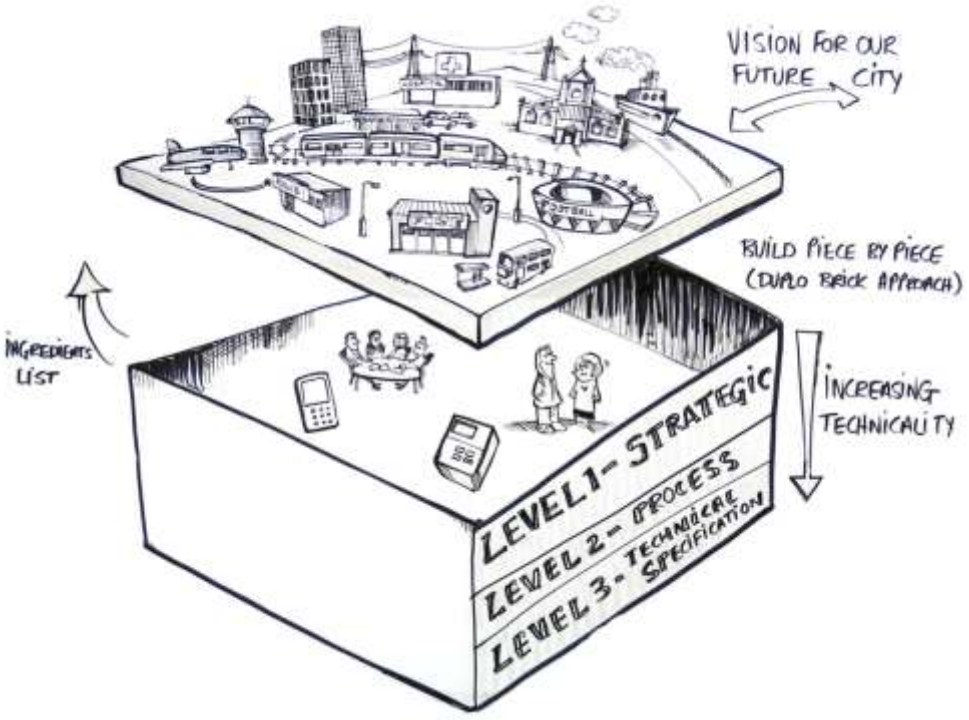
Smart city standards landscape

✓ **Principles-based standards**
guidance to help the City Authority define its targets

✓ **Performance standards**
help the City Authority procure and deliver the infrastructure and services

✓ **Technical standards**
ensure data across the city is suitable for use in a range of service delivery sectors



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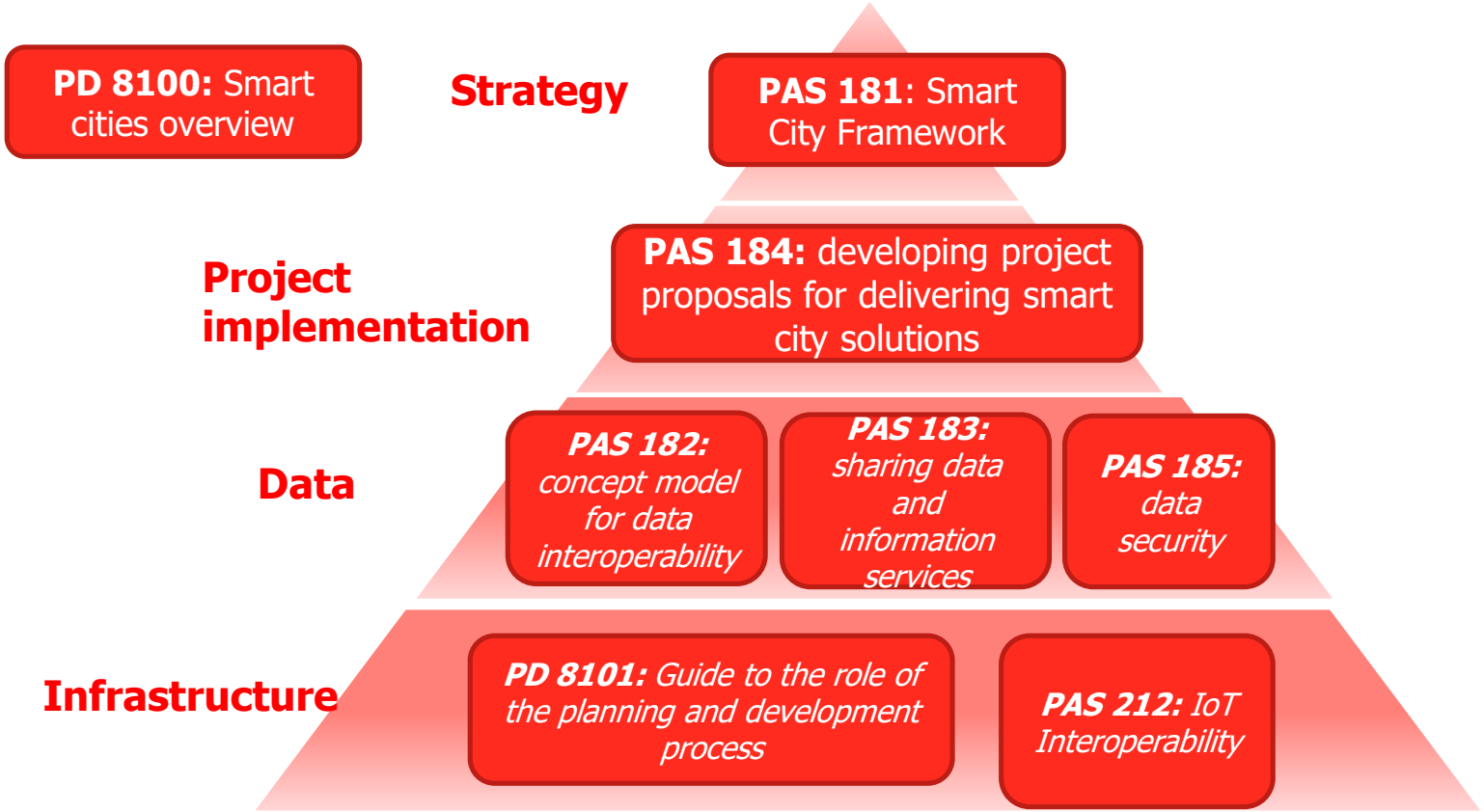
Integrated suite of BSI smart city publications



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Smart city leadership programme

- Based on our PD 8100 - *Smart City Overview* and PAS 181 - *Framework*
- Brings together city leaders to help set smart city strategy
- Results in development of a bespoke smart city roadmap

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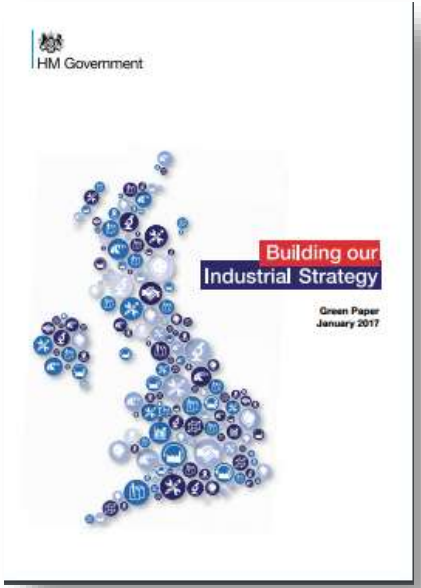
Smart infrastructure / assets standards

Developing a Smart Infrastructure standards strategy which will support industry and governments through:

- **Take up** – create clarity over existing landscape, consistent standards framework across data, communications, security, IoT and BIM,
- **Knowledge transfer** – grow communities of interest with cross-sector expertise to ensure a joined-up IOT led approach to BIM, Smart Cities,
- **Innovation** – identify where agile approaches to consensus standards development can build trust in technology and supply chain, accelerate routes to market and the adoption of good practice by clients and industry.



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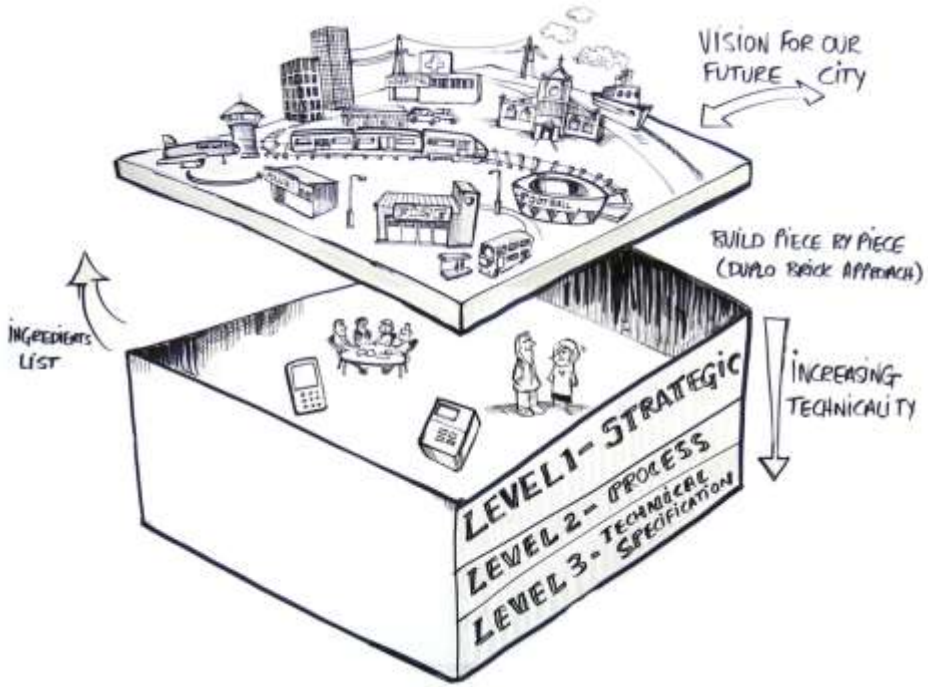
So, we start with truly Smart cities



Which are served by smart infrastructure

Which contain smart buildings and assets

Source - Hypercat

In conclusion…

- Collaborative BIM is being embraced around the globe,
- The first ISO BIM standards should be available around the end of the year,
- BSI host all of our BIM standards and supporting guidance on –

  www.BIM-level2.org

- We have now started work on the convergence of BIM with Smart Cities, and IoT,
- It's been a long time coming but the digital revolution of our sector has truly begun - care to join us?

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BSI Group Supporting the digital transformation of the Built Environment

- Andy Butterfield
- Director of Built Environment,
- Global Product Certification
- 26th March 2018

UK Superbrands 2018

By Royal Charter

BSI Group Supporting the digital transformation of the Built Environment through Certification solutions

- Introduction to BSI Product Certification and the BSI Kitemark
- The process of developing BSI Kitemark certification, collaboratively
- Global adoption of the BIM Kitemark, and overview of market development
- Supporting clients with BIM Certification, a case study (RTA case study)
- Future Certification development, including Smart Cities and the IoT

Introduction to BSI Product Certification and the BSI Kitemark

The Kitemark™

The Kitemark:

- Was introduced by BSI in 1903
- Is a 'trust mark' owned by BSI
- Is used on products, services, websites and now organisations

The Kitemark stands for

British **S**tandards **V**erified

All Kitemark schemes are voluntary

The Kitemark demonstrates that the product or service has been tested as it will be used

The Kitemark has Global reach

Above all, the Kitemark remains relevant

BSI Kitemark, a diverse product & service portfolio


Electrical Appliances


Complex Electronics


Lighting


Fire detection and alarm systems


Masonry


Cement and Concrete


Guttering


Simple Financial Products


Gas fires and space heaters


Central heating boilers


Fire extinguishing equipment


Valves


Impact Protection


Wastewater and drainage


Fittings


Eye protection


Locks


Vehicle Damage Repair


Electronic components


Electrical devices


Domestic alarms


Hoses


Respiratory protection


Hearing protection


Windows and Doors

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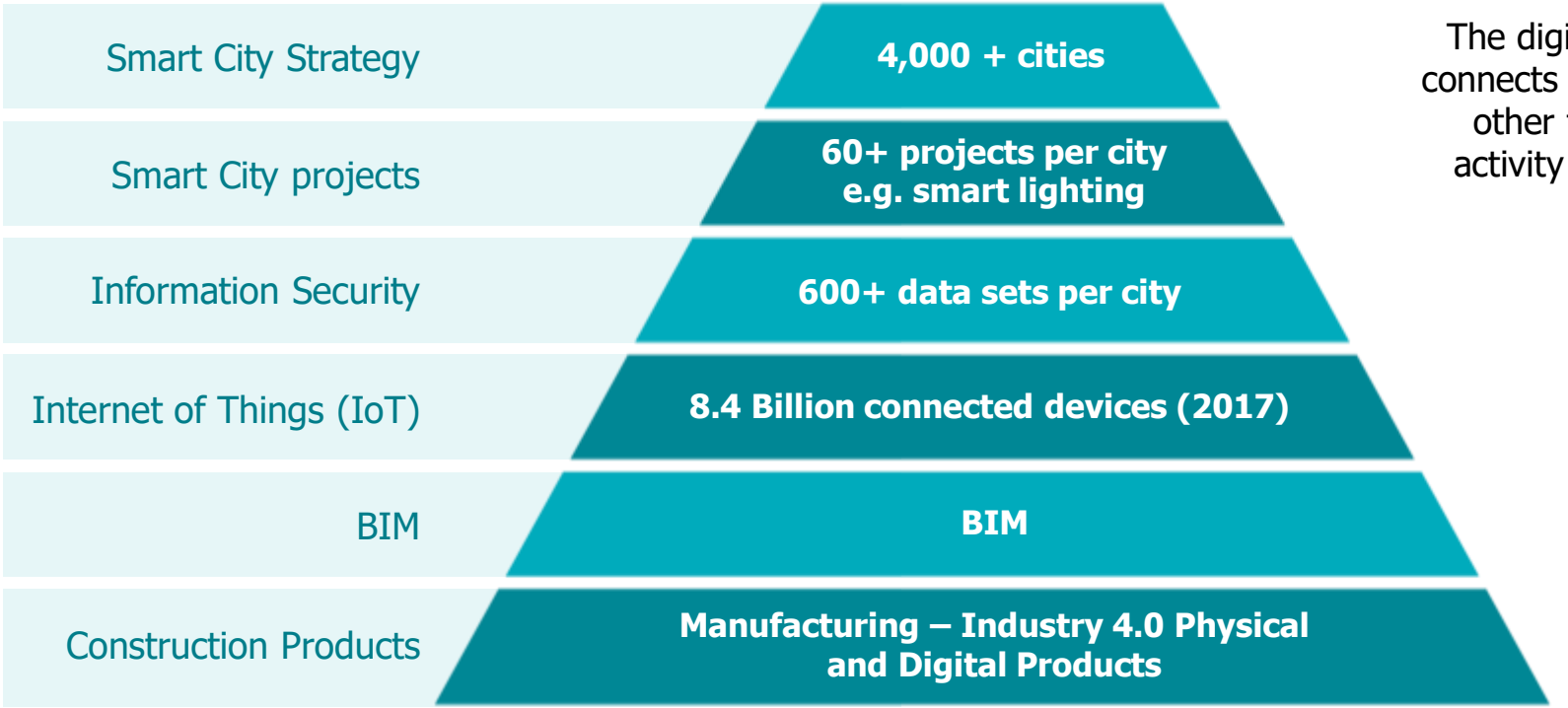
Supporting digital transformation of the Built Environment



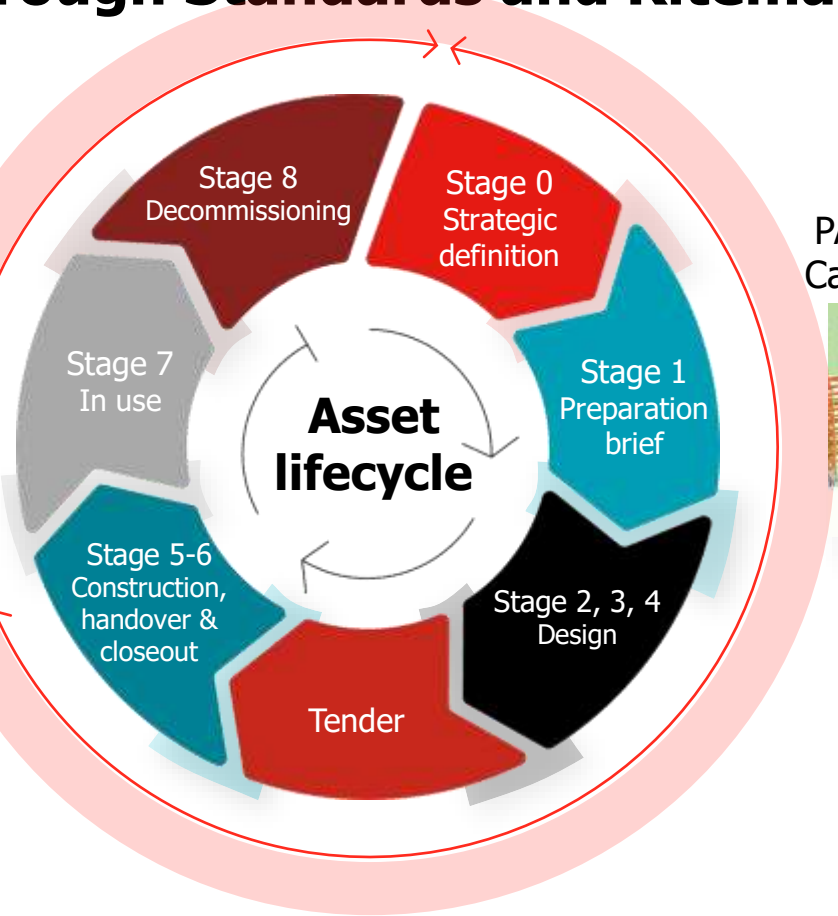
The digital approach connects across many other facets of BSI activity and thought leadership

Applying BIM through Standards and Kitemark

PAS 1192-3
Asset Management

BS 1192:2007
Collaborative
Information

PAS 1192-2
Capex phase



PAS 1192-5
Cyber security

BS 1192-4
Using COBie

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The process of developing BSI Kitemark certification, collaboratively

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The process for shaping our certification collaboratively

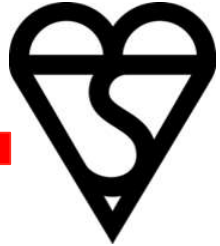
Standard

Stakeholder 'community'

Shaping of Kitemark Framework

Review comments

Consensus



Global alignment

Developing the Kitemark through collaboration

Built Environment community.

Clients • Designers • Constructors • Manufacturers • Operators

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Developing the Kitemark through collaboration

Built Environment community.

Clients • Designers • Constructors • Manufacturers • Operators

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Global adoption of the BIM Kitemark, and overview of market development

Supporting clients with BIM Certification, - RTA case study

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Global adoption of BIM Kitemark - China

Wanda Group, Beijing – largest commercial property owner in China

- 3 day BIM Kitemark Gap Analysis
- BIM & Smart Cities awareness seminar

Global adoption of BIM Kitemark - Europe

Cobouw50 speaker & BAM Infra certificate Ceremony

BSI Speakers:
Gary Fenton and Gary Pattison

Global adoption of BIM Kitemark - Europe

Press Release

Social media

In progress

Cobouw article (base on joint interview)

BAM video with stakeholder interviews

BAM case study

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Global adoption of BIM Kitemark - Australia

February

BIM Launch
Roundtable in Sydney
20+ potential clients
and influencers

October

CIMIC certified
Gary Pattison certifies one of largest contractors in APAC
Cross trains Oz team
Attends meetings with TfNSW and Ventia

November

Ferrovial certified
Introduction from UK team as certified in UK
Audit delivered by Australia auditor

December

Press Release
Joint PR with CIMIC about first Kitemark being released in December

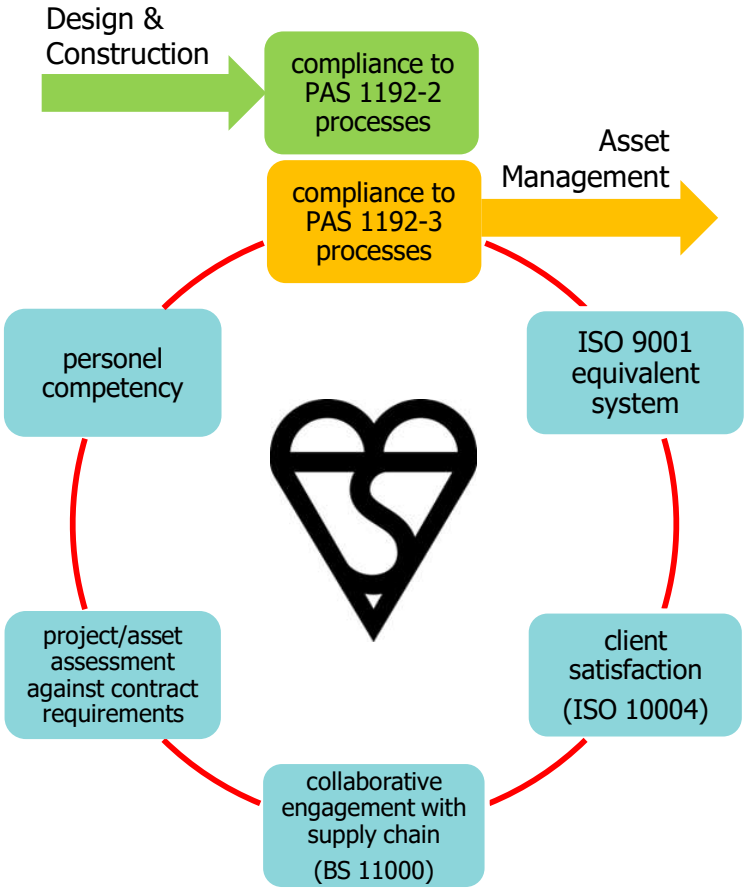
Global adoption of BIM Kitemark

BIM Kitemark clients in 8 countries

UAE, UK, China, Australia, Germany, Netherlands, Belgium & Spain

Case study: RTA

Creating consistent requirements across the entire asset lifecycle.



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Case study: RTA

Ensuring that BIM is embedded from the start.

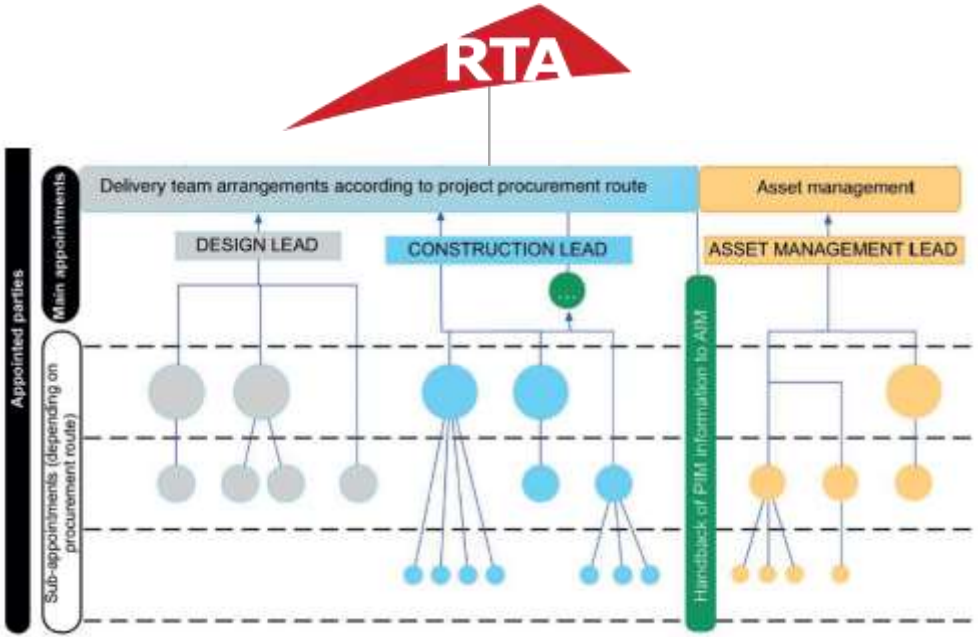
- Problem: lack of EIRs / information specification
- RTA **1st** BIM Kitemark specifier scope

EIR / **AIR** specification

Verification of the delivery team's capability

CDE setup & management

Project management



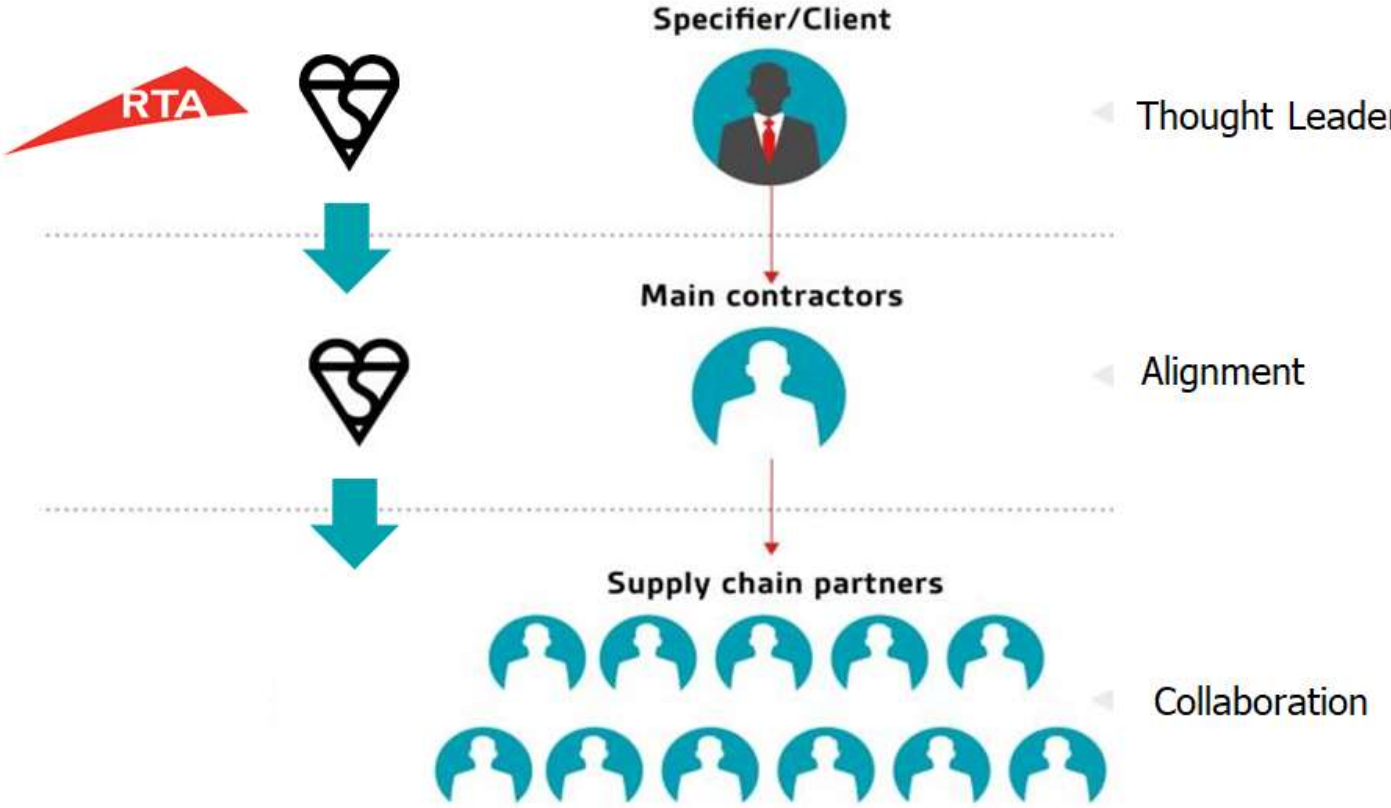
First organisation globally to achieve
PAS 1192-2 & PAS 1192-3 Kitemark

- Applying BIM to the entire lifecycle of the asset
- Adoption of Partnership approach across the supply chain

"I congratulate RTA on their achievement in becoming the World's first organisation to be awarded Kitemark across the whole asset lifecycle"

BSI Group

BSI certification model



Future Certification development, including Smart Cities and the IoT

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Built Environment, next steps

- Information Security
  - BIM – PAS 1192-5,
  - Smart City information security (PAS 185)
  - Internet of Things (IoT) Kitemark
- Smart Cities, Communities and Assets
  - Smart City Kitemark (PAS 181)
  - Development of a Smart Assets PAS
  - IoT international projects & programmes

Smart Cities Kitemark: PAS 181

- Assesses the maturity of Smart Cities and Communities
- Measures cities progress against four defining smart city principles:
  - Visionary
  - Digital
  - Citizen centric
  - Open & Collaborative

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The evolution of our cities

- Mobility as a service
- Summon a vehicle with your phone (e.g. Uber)
- Autonomous vehicles

BSI Expertise and Experience:
Enabling Digital Transformation

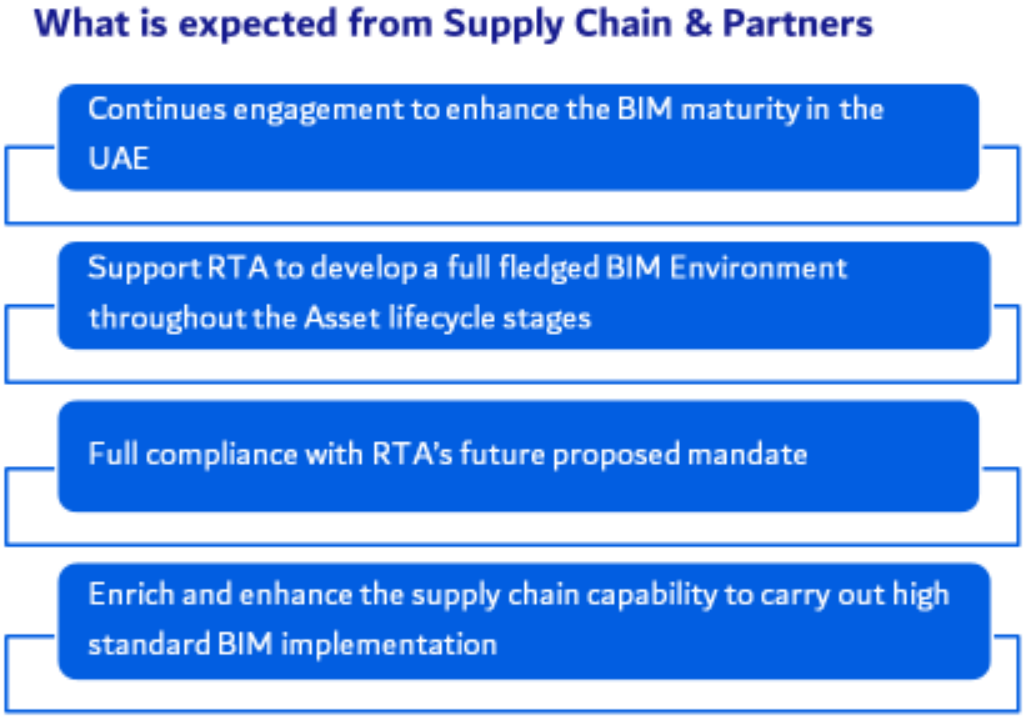
Summary

Thought leadership, RTA demonstrating best practice, globally

Alignment with Tier 1 contractors critical to success

Collaboration through the entire supply chain

…Congratulations to RTA



When it matters most
trust the **BSI Kitemark™**

TRUST

Quality, Safety, Trust