European Public Leadership in BIM: Driving Performance, Innovation and Growth

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International Director, UK BIM Task Group

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European Construction Market –
Key figures and drivers for change

Key figures:

- € 1.2 trillion ($10^{12}$)
- 9% GDP
- 18 million jobs
- 3.1 million organizations (95% SMEs)

Drivers for Change:

- Urbanisation and housing crisis
- Workforce skill level
- Resource scarcity
- Climate change
- Ageing infrastructure
- Improving existing stock

Ref: The European construction sector (EC-2016-1253962)
Construction: declining productivity and low digitalisation

Productivity

Digitalisation

Other non-farm industries

Construction Sector
Causes of low productivity

Traditional ways of working...

- Fragmented project process
- Paper based - errors

Misunderstanding of client needs
Miscommunication
Rework and recreation of data
Poor or no information management

Cost of waste in the sector

35%
Value proposition of BIM

- **Economic**: increase productivity, potential for growth, enhance position of European industry on international markets (construction, IT), ...

- **Environmental**: less waste, lean supply chain, lower energy demands, lighter carbon footprint, ...

- **Social**: facilities aligned with societal needs, job creation

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What kind of savings are possible on the € 1.2 trillion

- 0,1%: 1,2 billion €
- 1% : 12 billion €
- 10% of 120 billion €
Why provide public leadership: a driver for innovation

As large public procurers we are;
- Non-competitive
- Transparent
- Non-discriminating

Investing Public Money;
- Leading the market through procurement
- Creating fertile environment
EU: Public Procurement Directive

Article 22

Rules applicable to communication

• (1) Member States shall ensure that all communication and information exchange under this Directive, in particular electronic submission, are performed using electronic means of communication [...].
BIM in Public Procurement:

• (4) For public works contracts and design contests, Member States may require the use of specific electronic tools, such as building information electronic modelling tools or similar.

• In such cases the contracting authorities shall offer alternative means of access, [...], until such time as those tools become generally available [...].
### Rapidly evolving national digital programmes

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<tr>
<th>Germany</th>
<th>Norway</th>
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<td>Bundesministerium für Verkehr und digitale Infrastruktur</td>
<td>STATSBYGG</td>
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<th>Finland</th>
<th>Spain</th>
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<td>Senaatti</td>
<td>es.BIM Implantación del BIM en España</td>
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<th>France</th>
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<td>Plan Transition Numérique dans le Bâtiment</td>
<td>BiM Building Information Modelling (BIM) Task Group</td>
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<th>Netherlands</th>
<th>Denmark</th>
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<td>Rijkswaterstaat Ministry of Infrastructure and the Environment</td>
<td>BYGNINGSSTYRELSEN</td>
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Risks of not collaborating

- Adding cost burden
- Slowing economic growth
- Confusing the market
- Closing markets
- Losing competitiveness
EU BIM Task Group

• Deliver greater value for public money

• Increased openness, fairness, competitiveness and productivity

• Stimulating innovation and growth in the construction and digital economies
Survey of current European public sector practices for the encouragement and introduction of BIM (into public estate and policy)

- Determine state of public BIM programmes across Europe

11 active programmes in progress (out of 16 responses)
The EU BIM Task Group

Deliverables

• 2-year program co-funded by the EU Commission, started Feb 2016
• Create a Common Framework for BIM in public works

Target Groups

• EU Public estate owners
• EU Public procurers
• EU Policy makers and
Establish a Common Framework / Handbook

The ‘why’ – key incentives for acting now:
- Drivers for Change
- The value proposition of digitalization and BIM
- The value proposition for EU Alignment on BIM

The ‘how’ –
Strategic Guidance for introducing BIM at
- National/strategic level
  - A framework for introducing Europe’s public sector BIM programs

The ‘what’ –
Operational Guidance for consistent procuring and delivery
- A common EU performance level
- Refer and encourage standards
Establish a Common Framework / Handbook

The Strategic Level: „The How“
Questions for the Public Sector

What makes a robust and impactful BIM programme?

WHAT IS THE ROLE OF THE PUBLIC SECTOR STAKEHOLDER?

When and how should I use pilot projects?

What is the role of industry, associations and standards bodies?

How should to introduce BIM as a public procurer?
Strategic Framework for Public Sector BIM Programs

Grow Industry Capacity
- Early wins, pilot projects, training
- Increasing use of strategic lever to grow capacity
- Measure and monitor, case studies, embed change

Communicate Vision & Foster Communities
- Engage industry stakeholders
- Create regional and focus networks
- Events, media, web, social media

Build a Common Collaborative Framework
- Legal and regulatory framework
- Data and process standards
- Skills, tools, guidance

Foundation of Public Leadership
- Compelling drivers, vision and goals
- Aligned value proposition and strategy
- Sponsor, funded programme, stewardship team
## What are the recommendations? 1 of 12

<table>
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<tr>
<th>Highly recommended</th>
<th>Recommended</th>
<th>Encouraged</th>
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<td><strong>1. Vision, Drivers &amp; Goals</strong></td>
<td>Ensure clear public drivers and goals are defined and documented.</td>
<td>During the BIM adoption process, change management strategies should be implemented to support and monitor commitment, to detect problems or inefficiencies, and where needed to take corrective actions.</td>
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Establish a Common Framework / Handbook

The Operational Level: „The What“
What is a BIM Project?

A BIM project | Design & documentation
- 3D object modelling software
- Agreed methodology and standards
- Embedded information generates tags and datasheets
- Creation of 2D and 3D output

A BIM project | Coordination
- Use of shared setting-out and coordinate data
- Direct referencing of other disciplines 3D information
- Coordination of discipline zones
- Virtual design reviews and clash detection workshops

A BIM project | Clash avoidance
- Course – Clashing between different building zones or spaces
- Medium – Clashing between building components
- Fine – Soft clashing for builder's work and maintenance access

A BIM project | Operation
- Facilities and operations management model
- Equipment lists, specifications and maintenance information
- Monitoring and feedback systems
- Portable hardware

A BIM project | Build
- Virtual construction and coordination
- Data driven setting out and monitoring
- Improved understanding of models over drawings

A BIM project | 4D Modelling
- Linking the construction programme to the project model
- Overall site planning
Common European BIM Performance Level

- People
  - Skills, training
  - Roles, professional development

- Policy
  - Legal and procurement
  - Requirements

- Process
  - Workflow
  - Sharing information

- Technical
  - Data
  - Objects
HOW TO TRAIN 18 MILLION PEOPLE...

- Responsibilities
- Consistent education
- Capacity building

HOW TO DEFINE OUTCOMES...

- Liability, IP
- Employers Information Requirements
- Execution Plan (pre- and post-award)

HOW TO DEFINE COMMON WAYS OF WORKING...

- Common data environment
- Version control
- Manage information

HOW TO DEFINE INPUTS...

- Exchange format
- Objects, classification
- Security minded

People & Skills

Legal & Procurement

Process & Workflow

Technical & Data

Responsibilities
Consistent education
Capacity building

Liability, IP
Employers Information Requirements
Execution Plan (pre- and post-award)

Common data environment
Version control
Manage information

Exchange format
Objects, classification
Security minded
### What are the recommendations? ...

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<td>Contractual arrangements</td>
<td>Obligations, liabilities and associated limitations for BIM are incorporated into the contract, for example as a BIM specific appendix or protocol.</td>
<td>Provide templates for BIM specific arrangements for different procurement strategies.</td>
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Launch Date:
6\textsuperscript{th} July 2017, Brussels
Innovation in Europe

- Public leadership growing
- Accelerating national adoption
- Benefits to private and public sector
- Common standards emerging
- Creation of Single Digital Construction Market
European alignment
A common approach to BIM

15-25% by 2025
Bringing together national efforts into a common and aligned European approach to develop a world-class digital construction sector