



## European public sector aims for world class construction sector

**Dr. Ilka May**  
**Co-Chair and Head of Delivery EU BIM Task Group**



Co-funded  
by the  
European Union







## Handbook for the Introduction of BIM by Europe's Public Sector Community



**Who is the EU BIM Task Group?**

**Why is it needed?**

**Why do we need a BIM handbook?**

**What is in the handbook?**

**Driving digital innovation: strategic action for  
competitiveness, value and growth**







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## Who is the EU BIM Task Group?



**Driving digital innovation: strategic action for  
competitiveness, value and growth**





# Representatives from 21 EU Member States



## The public sector: driver for innovation

As large public procurers they are:

- Non-competitive
- Transparent
- Non-discriminating

By investing public money, they

- Underlie certain rules and regulations
- Lead and influence the market through procurement
- Have the power to create fertile environment





# The EU BIM Task Group

## Deliverables and Planning

- 2-year program co-funded by the EU Commission, started Feb 2016
- Create a Common Framework for BIM in public works in Europe
- **Handbook**, Video, Website and Materials
- Launch and Closeout Conference

## Target Groups

- EU Public estate owners
- EU Public procurers
- EU Policy makers

## Acknowledgements

The production of this handbook has been a pan-European collaboration of public sector organisations across 21 countries. This collaboration is the EU BIM Task Group, co-funded by the European Commission. Its work is overseen by a Steering Committee of the following individuals:

Pietro Baratono, Angelo Ciribini: Italian BIM Commission and Ministry of Infrastructure and Transport  
 Mark Bew MBE: UK Government's BIM Task Group and Digital Built Britain  
 Barry Blackwell: UK Government's Department for Business, Energy and Industrial Strategy  
 Diderik Haug: Norway Statsbygg, Special Adviser to the EU BIM Task Group  
 Benno Koehorst, Hester van der Voort: Netherlands' Rijkswaterstaat  
 Richard Lane: Project manager for the EU BIM Task Group  
 Ingemar Lewen, Jennie Carlstedt: Trafikverket, Swedish Transport Administration  
 Adam Matthews: Chair of the EU BIM Task Group  
 Ilka May: Deputy chair of the EU BIM Task Group  
 Souheil Soubra: CSTB on behalf of France's PTNB  
 Virgo Sulakatko: Estonia's Ministry of Economic Affairs and Communications  
 Jorge Torrico, Elena Puente Sanchez: Ineco on behalf of the Spanish Ministerio de Fomento

*Steering Committee*

The Steering Committee would like to thank the General Assembly members of the EU BIM Task Group for contributing their time and expertise to this handbook:

Belgium _____ Belgian Buildings Agency	Netherlands _____ Rijkswaterstaat (Ministry of Infrastructure and the Environment); Rijkswastgoedbedrijf (Government Real Estate Company)
Czech Republic _____ Ministry of Industry and Trade	Norway _____ Statsbygg, Norwegian Building Authority (DiBK)
Denmark _____ The Danish Building and Property Agency	Poland _____ Ministry of Infrastructure and Construction
Estonia _____ Ministry of Economic Affairs and Communications; Estonian State Real Estate LTD	Portugal _____ University of Lisbon
Finland _____ Senate Properties and Finnish Transport Agency	Slovakia _____ Slovak University of Technology in Bratislava
France _____ France PTNB; MediaConstruct; AIMCC	Slovenia _____ Ministry of Infrastructure
Germany _____ Federal Ministry of Transport and Digital Infrastructure; Federal Institute for Research on Building, Urban Affairs and Spatial Development	Spain _____ Spanish Ministerio de Fomento (represented by Ineco)
Iceland _____ FSR (Government's Construction Contracting Agency)	Sweden _____ Trafikverket (Swedish Transport Administration)
Ireland _____ The Office of Public Works	UK _____ Department for Business Energy and Industrial Strategy; UK Government's BIM Task Group and Digital Built Britain
Italy _____ Italian BIM Commission - Ministry for Infrastructure and Transport; ANAS (Road Administration); Italian Railways Italferr (FS Group)	European Parliament _____ European Parliament; General-Directorate of Infrastructure
Lithuania _____ Ministry of Environment, Lithuanian Road Administration; JSC Lithuanian Railways; State Enterprise Turto bankas	European Commission _____ Office for Infrastructures and Logistics
Luxembourg _____ Centre de Ressources des Technologies et de l'Innovation pour le Bâtiment (CRTI-B)	

*General Assembly*

This programme has been made possible through the support and co-funding of:

- The European Commission Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG-GROW)
- The UK Government's Department for Business, Energy and Industrial Strategy (BEIS), in its capacity as lead coordinator of the programme

The Steering Committee wishes to especially thank both Lutz Köppen (DG-GROW) and Barry Blackwell (BEIS) who have contributed greatly to the ambition, scope and realization of this programme.







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Why is it needed?





Driving digital innovation: strategic action for  
competitiveness, value and growth



# Rapidly evolving national digital programmes



Germany		Norway	
Finland		Spain	
France		UK	
Netherlands		Denmark	





# Ireland?

Germany		Norway	
Finland		Spain	
France		UK	
Netherlands		Denmark	

Any other comments?

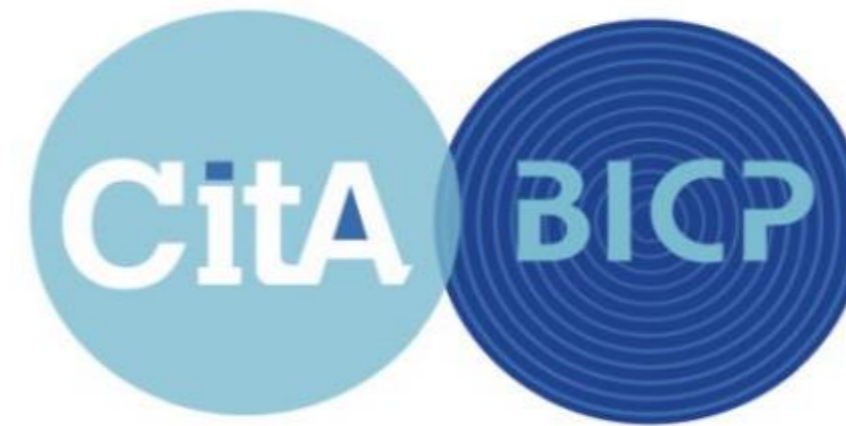
An Irish BIM programme is in its infancy. The BIM lished and is developing a guidance document contracting authorities.” Our organisation is a m

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CitA: **BIM** Innovation Capability Programme



Irish BIM Study 2017



BY THE EDITOR ON APRIL 24, 2017

IN THE NEWS, TOP STORIES

**The Construction IT Alliance (CitA) recently published its Global BIM Study as part of its BIM Innovation Capability Programme (BICP).**





## Risks to the EU market of not collaborating

- Adding cost burden
- Slowing economic growth
- Confusing the market
- Closing markets







# 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 through better alignment







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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
- Security
- Non-skilled workforce
- Resource scarcity
- Climate change
- Globalized markets
- Ageing infrastructures
- Improving existing stock

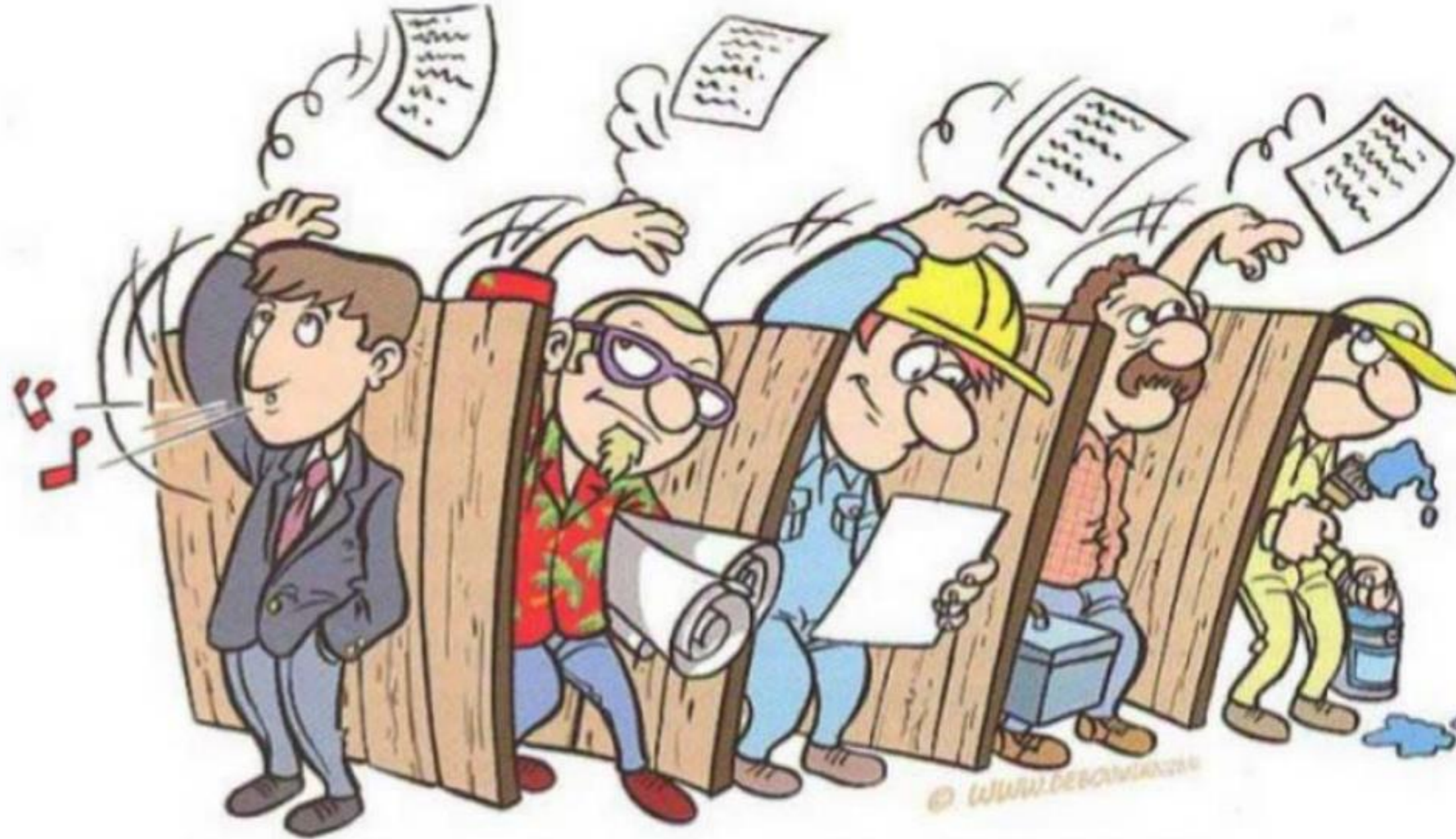


Ref: The European construction sector (EC- 2016-1253962)





# The Construction Sector – paper based silos

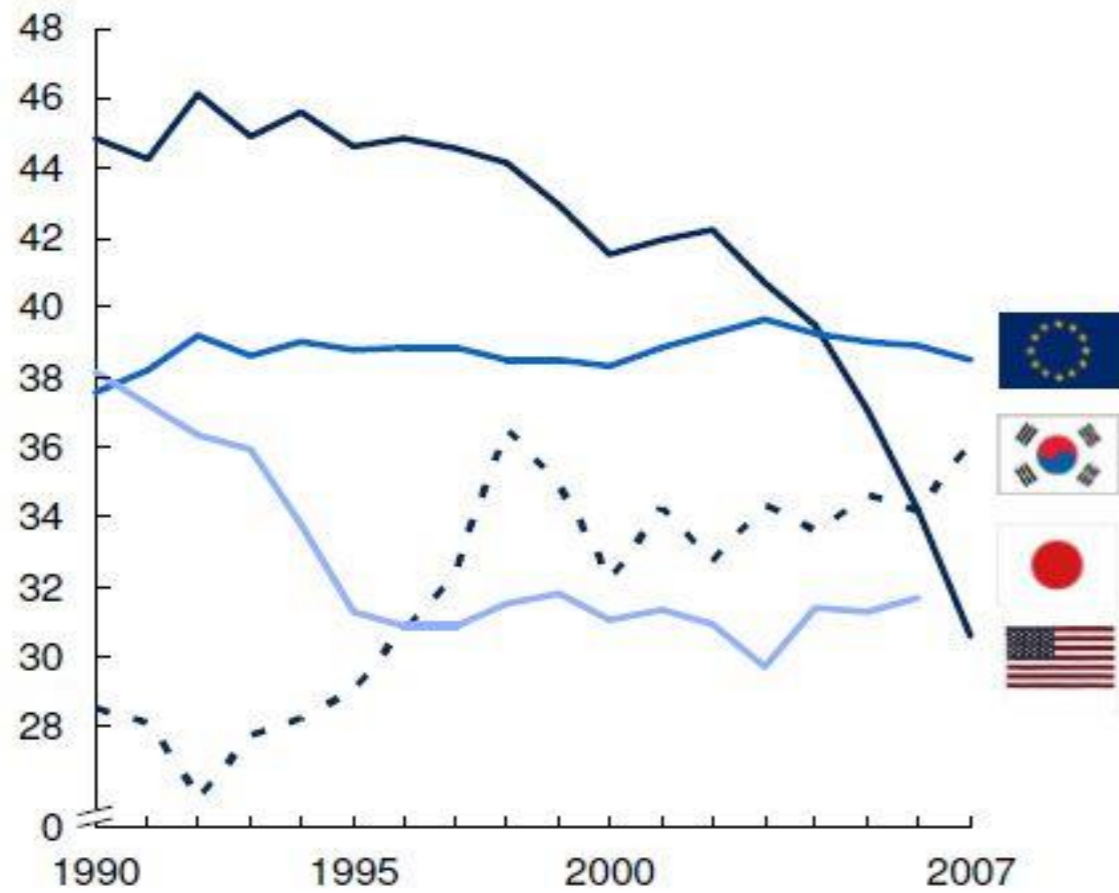






# Construction: declining productivity and low digitalisation

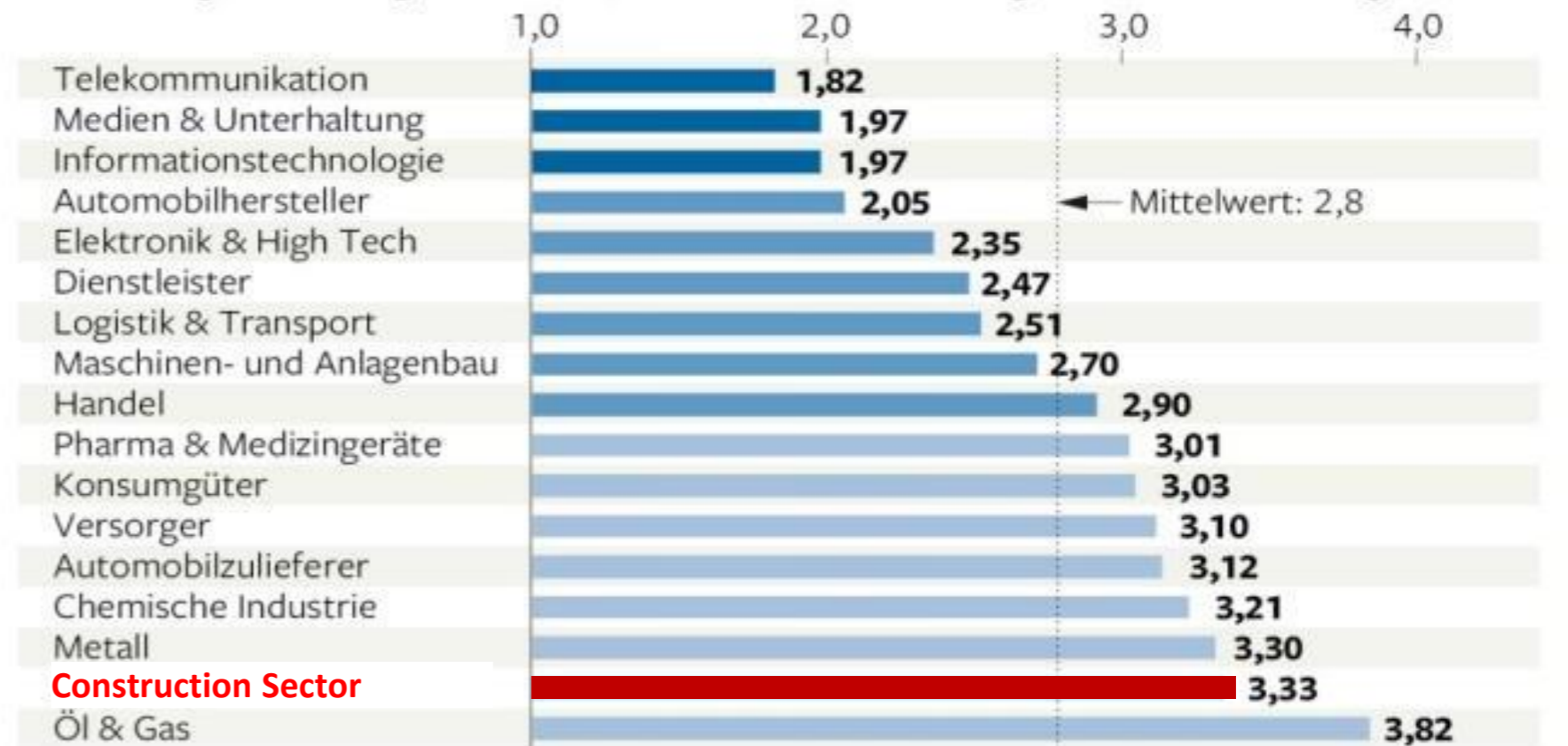
Construction productivity  
GVA per hour worked in 2007 PPP \$



SOURCE: EUKLEMS; Associated General Contractors of America, 2011; U.S. Bureau of Labor Statistics

## Productivity

Bewertungsskala 1 = größtenteils, 2 = teilweise, 3 = wenig, 4 = ansatzweise digitalisiert



QUELLE: TOP 500 STUDIE 2014/ accenture

## Digitalisation





# Spectacular failures in project deliver

Oxford Review of Economic Policy, Volume 25, Number 3, 2009, pp.344–367

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**Berlin**



The following key observations pertain to cost overruns in transportation infrastructure that in such situations promoters and forecasters intentionally use the following formula in order to secure approval and funding for their projects:

$$\text{underestimated costs} + \text{overestimated benefits} = \text{funding improved over time.}$$

Germany's most expensive construction site: Berlin Brandenburg Willy Brandt Airport.

**Berlin's beleaguered new international airport is turning out to be Germany's most expensive construction site. Round-the-clock lighting and air-conditioning contribute to energy costs even higher than those of the city's still-active Tegel Airport.**

May 27, 2013 - 01:49 PM

Print | Send

Feedback

**Berlin's new airport**, officially known as Berlin Brandenburg Willy Brandt Airport (BER), is shaking out to be the most expensive construction site in Germany. Since last summer, work on the once-touted, long-awaited and largely completed terminal has almost come to a standstill. For months, activity has been restricted

## Survival of the unfittest: why the worst

The following key observations pertain to cost overruns in transportation infrastructure that in such situations promoters and forecasters intentionally use the following formula in order to secure approval and funding for their projects:

$$\text{underestimated costs} + \text{overestimated benefits} = \text{funding}$$

improved over time.





# Improving asset performance

**HM Government  
Construction**

## 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

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


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

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

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

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

 **Digital Built Britain**

Courtesy of Dr. Mark Bew MBE, UK

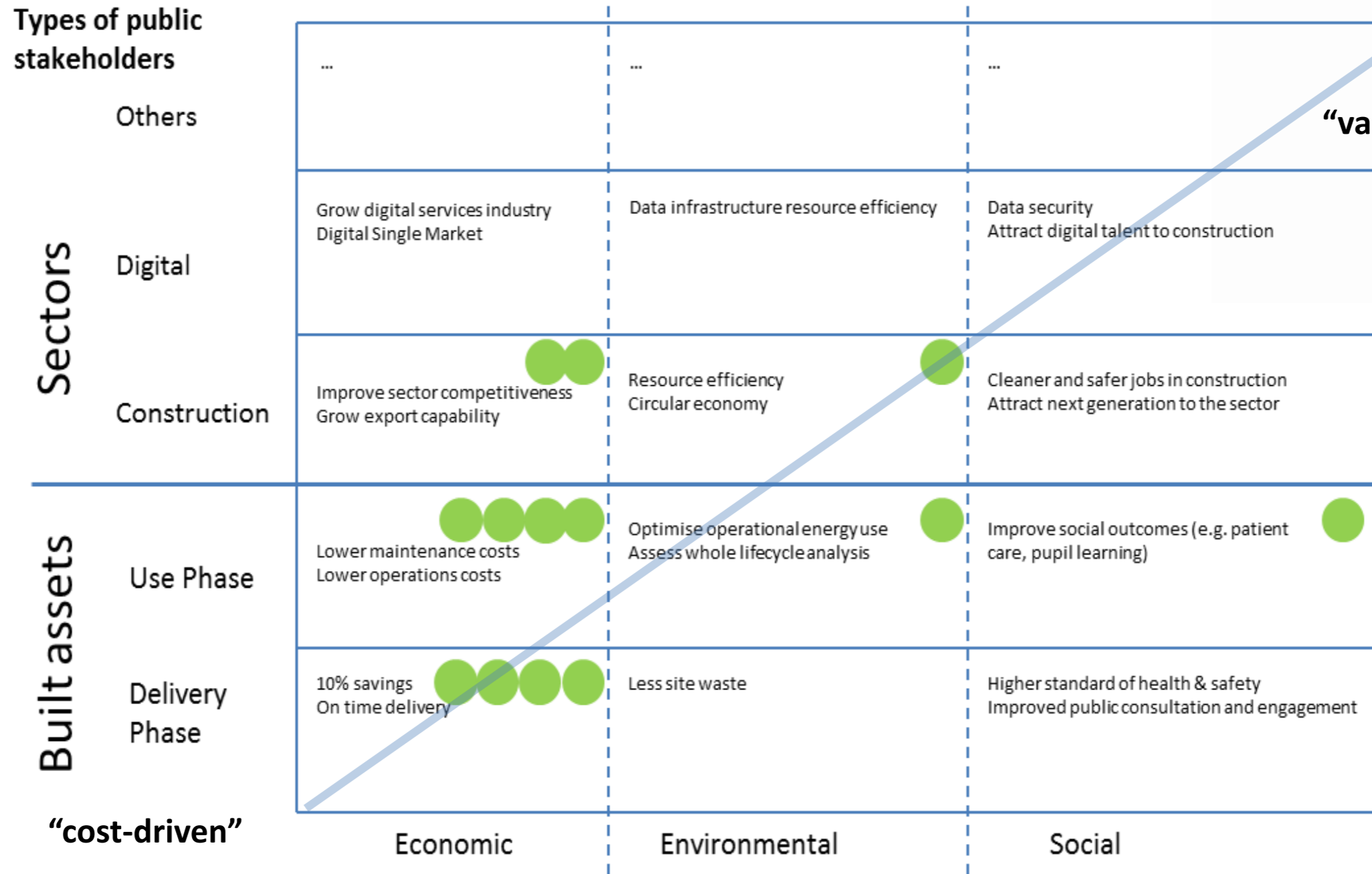
Dr. Ilka May | What Smart Cities can learn from F1 | SCS Forum | 26.09.2017







# What drives your organisation or nation to adopt BIM?







## 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 including for the “otherwise unemployable”, ...

### What kind of savings are possible on the € 1.2 trillion\*

- 0,1%: 1,2 billion €
- 1% : 12 billion €
- 10% of 120 billion €



\*Funding from the EU for this project was 115.000 €. The gap was funded by the UK





## So, why?

### Why provide public leadership to encourage BIM?

- Better value for public money
- Public procurement as a motivator for innovation
- Network effect of adoption: support for SMEs
- Digitalisation agenda

### Why are public organisations adopting a common approach to BIM?

- Accelerate national efforts
- Minimise costs
- Impactful and robust programmes
- Reducing trade barriers to growth
- International critical mass
- Encourage international standards developments







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## Strategic framework for public sector BIM programmes

### 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 and 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, visions and goals  
Aligned value proposition and strategy  
Sponsor, funded programme, stewardship team



© 2016 Matthews





# Strategic Framework Recommendations



Strategic Area	Action high level description
<b>Public leadership</b>	<ul style="list-style-type: none"> <li>Define compelling drivers, a clear vision and goals</li> <li>Describe the value of BIM to the public and private sector</li> <li>Document the general approach for moving the industry towards the defined vision and goals</li> <li>Identify a public sector champion to sponsor the initiative</li> <li>Establish an implementation team to drive the programme. The value proposition and sponsor can unlock the required funding and resources</li> </ul>
<b>Communication and communities</b>	<ul style="list-style-type: none"> <li>Early and frequent engagement with industry stakeholders is essential to support the industry change process</li> <li>Participate in and provide encouragement for regional and special interest networks to disseminate best practice</li> <li>Use mass communication tools, such as online media, events, web and social media to reach audiences</li> </ul>
<b>Collaborative framework</b>	<ul style="list-style-type: none"> <li>Assess and address legal, regulatory, procurement and policy barriers in order to facilitate collaborative working and sharing of data.</li> <li>Develop or use international standards for data requirements</li> <li>Reference international standards for encouraging collaborative processes and sharing of data</li> <li>Produce guidance and tools to support the upskilling of industry and development of academic curricula</li> </ul>
<b>Capability and capacity development</b>	<ul style="list-style-type: none"> <li>Run pilot projects and promote training to encourage early successes.</li> <li>Increase the use of public procurement as a driver for industry capacity development</li> <li>Measure progress, produce case studies to increase industry awareness and support</li> </ul>



## Strategic framework for public sector BIM programmes



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## PUBLIC LEADERSHIP ACTION 2 DOCUMENT THE VALUE PROPOSITION AND STRATEGY

### What are the actions?

Firstly, define the expected benefit of BIM in relation to the objectives of the public sector organisation. Secondly, document the proposed strategy to be implemented by the public sector organisation to introduce BIM to the public estate and/or across the construction sector.

### Why are the actions important?

The value proposition is important to clearly explain why the public sector should provide its resources to support the wider adoption of BIM across private industry. It provides the required support for an investment request, i.e. a business case for funding.

Documenting the strategy of the programme is required to gain the support and buy-in from key industry and public sector stakeholders to ensure people pull together in the same direction rather than taking different actions that could weaken the overall programme. A well described and approved strategy is a standard component of any successful change programme.

### What are the recommendations?

	Highly recommended	Recommended
Value proposition & Strategy	<p>Define clear value proposition and strategy for introduction of BIM. Use public sector procurement as a lever for the introduction of the programme.</p> <p>Adopt the strategic framework and performance level introduced in this document.</p>	<p>Should consider phased roadmap development for progressive introduction of BIM to public works.</p> <p>Should provide a definition for BIM. Ideally refer to a set of levels or modules that require a level of performance.</p>

## CASE STUDY



### Digital Road Map for Design & Construction, Germany

**Framework/ Performance Criteria:** Strategic Framework Recommendations  
**Topic:** Document the value proposition and strategy  
**Recommendation:** Define a clear value proposition and strategy for the introduction of BIM. Use public sector procurement as a lever for the introduction of the programme.

**CONTEXT**  
 Awareness is growing across the industry that a step change is required in both pace and behaviour, if Germany wants to avoid falling even further behind other nations in Europe and international markets. Recent spectacular major project failures, such as Berlin Airport or Stuttgart's central train station, have fuelled that debate and triggered strategic action.

**Strategy**  
 In December 2015, the Federal Ministry of Transport and Digital Infrastructure (BMVI) launched its strategic Road Map for BIM for the transport infrastructure sector in Germany. This internationally aligned plan, a joint project of government and industry was largely developed by an industry-led initiative "planen-bauen 4.0" in 2015. It has been designed to facilitate the target that BIM is to be applied on all new public projects procured in Germany from the end of 2020 onwards. A phased mobilization period prior to 2020 is intended to provide a progressive roadmap for the development of capability and capacity in the market.

At a strategic level, the Road Map comprises a guiding principle, a hypothesis that describes the value proposed for Germany and a vision for the German construction industry in the digital age.

The plan defines a common definition of BIM that can be understood across the entire industry, and used within organisations and on construction projects. This common definition for BIM, known as "Performance Level 1", includes a reference process for creating, managing and sharing digital data. The consistent application of this process can unlock the benefits of BIM, such as increased planning confidence for on-time delivery, transparency and productivity efficiencies, in a proven, low-risk and cost-efficient manner.

Performance Level 1 is the first step on a progressive journey of the digital maturity of the market. Three levels of maturity are envisaged for Germany. This first step provides the foundation of a lossless and secure data exchange between all the parties involved in the project and asset lifecycle.

In addition to the processes required to achieve this, vendor-neutral data exchange formats have been defined as Performance Level 1 criteria. The aim is to support neutrality towards software products and tools; and to encourage innovation in processes, tools and workflows.

**Value Proposition for Germany**  
 The strategy supports the wide use of BIM at "Performance Level 1". The value proposition to Germany and its construction value chain is to lay the foundations for an even more integrated way of working in an open and collaborative data environment. It is intentionally designed to deliver better products, services and data with the software and tools available today and particularly under the currently existing policy, procurement and legal framework in Germany.

**WHY WAS IT DONE AS DESCRIBED?**  
 Progressive roadmap to support and grow SMEs  
 The small and medium enterprises (SME) – the "Mittelstand" form the engine room of Germany's strong and successful economy. There has been a huge concern that the change introduced through BIM might overburden SMEs and lead to monopoly positions and dependencies.

Germany's strategic plan, similar to the UK Government's Construction Strategy 2011, sets out clear targets and objectives in a five year programme as intended to protect and grow the SMEs and to support the wider industry transformation. This included procuring on public projects the delivery and sharing of neutral open format data and not specifying vendor-specific solutions.

**Documenting the strategy, essential support for the industry change**  
 The challenges of introducing change to an entire industry sector are vast. A clearly documented strategy, that can be published, communicated, discussed and explained in all means of communication is an essential milestone and enabler to the change process.

**Developing the strategy, building buy-in**  
 The development of the road map took five months. The process involved three workshops with over 40 participants from client organisations, designers, architects, contractors, lawyers, software vendors and operators. The workshops were crucial in building maximum buy-in and support from all members of the construction value chain. The plan was published by the German Transport Minister Alexander Dobrindt at a high profile launch event in December 2015. This event attracted significant media interest and facilitated the industry change process.

**WHAT LESSONS CAN BE LEARNED?**  
**What worked?**  
 The strategic roadmap provides essential clarity and consistency at a high level. It also helped to identify and prioritise activities and funding requirements. Client and supply chain organisations use the plan as a guide for procuring projects with a consistent understanding and common implementation activities.

**What we learned**  
 What the year 2016 has shown is how hard it is to communicate a strategic plan to an industry that employs over 6 million people and to make people feel that the plan is relevant to them. It has also revealed that with a top-down implementation in the public sector it can be difficult to overcome special stakeholder interests preventing change in some areas.  
 However, there is no doubt that the plan is being adopted by the industry on both sides, client and supply chain, and that it contributes to an accelerated adoption of BIM in Germany.

**FURTHER INFORMATION**  
 The "German Road Map for Digitalisation in Construction" can be found on the website of the German Ministry for Transport and digital infrastructure (German and English version):

■ <http://www.bmvi.de/SharedDocs/EN/publications/road-map-for-digital-design-and-construction.html?nn=212250>





## PUBLIC LEADERSHIP ACTION 3 IDENTIFY SPONSOR, FUNDING AND STEWARDSHIP TEAM

### What are the actions?

The last component in establishing public leadership highlights the value of a public sector representative to be a sponsor or champion for the programme, and for the necessary funding and resources to drive the programme forward.

A public sector sponsor or champion is an individual or group of stakeholders (e.g. a Minister, Director or Construction Client Group) that have the appropriate level of seniority and responsibility to inform and influence others within the public sector organisation(s). For example, the sponsor might support the funding request decision-making process, or speak publicly at an industry conference about the programme.

Funding for the programme would likely include a modest investment to fund a small team of people to lead the programme, for developments and for communications and skills development activities.

### Why are the actions important?

This is the last step in establishing public leadership, enabling funding to be provided and practical action to be taken. Gaining the support of a senior public sector advocate increases the visibility and authority of the programme both within government and with industry stakeholders. It also unlocks access to funding and acquires resources that allow the programme plans to be executed.

### What are the recommendations?

	Highly recommended	Recommended	Encouraged
Sponsor, funding and stewardship team.	<p>The introduction of BIM to the public estate or as a policy requires resources and a plan.</p> <p>Therefore there must be funding for a defined program and an executive team with sufficient experience to implement the program.</p>	<p>Should provide a visible public sponsor (i.e. the individuals that are ultimately responsible for the program).</p> <p>Ensure that all parts of the industry are engaged in the program.</p>	<p>Could consider a public and private initiative for funding and a joint program.</p> <p>Encourage alignment with EU funded programmes and make use of available funding</p>

## CASE STUDY



### UK Government's Construction Strategy 2011 & BIM Programme

**Framework / Performance Criteria:** Strategic Framework Recommendations  
**Topic:** Sponsor, funding and stewardship team  
**Recommendation:** The Introduction of BIM to the public estate or as a policy requires resources and a plan.

#### CONTEXT

The UK's BIM Strategy was issued as part of the UK Government's Construction Strategy 2011. The strategy set a mandate for the use of "collaborative BIM" on all centrally procured built assets across all government departments by 2016. The UK defined "collaborative BIM" as Level 2 BIM. The levels indicate the progressive digital maturity of the market.

This mandate was later supported across parliamentary terms by the Construction 2025 policy and the Construction Strategy 2016-2020.

#### SPONSOR

The UK Government's Cabinet Office are responsible for co-ordinating the UK Government's drive to the development of standards enabling all members of the supply chain to work collaboratively through Building Information Modelling (BIM). The Construction Strategy and the BIM programme were launched by the Minister for UK Government's Cabinet Office, Lord Francis Maude in May 2011 at a high profile industry event.

#### Funding, with a plan and implementation team

The BIM strategy set out a clear progressive plan of activities over a five year period. The plan defined strategic areas of work:

- communications with industry and academia
- development of tools and standards
- increasing the capability of public clients and increasing the introduction of BIM on public projects

The plan defined a budget and resources to deliver the strategy. £5m was granted to industry and provided to the Construction Industry Council (CIC) to establish the UK BIM Task Group. This group would work with industry to define the new ways of working, standards and support Government Departments in adopting the new ways of working and disseminate knowledge to industry. <http://www.bimtaskgroup.org/>

#### WHY WAS IT DONE AS DESCRIBED?

**Strategic fit with existing economic and environmental drivers**  
 With increasing demands on Government investment in a period of reduced tax receipts, the UK Government Level 2 BIM programme supports the achievement of the following targets set in the Construction 2025 policy:

- 33% cost reduction in the initial costs of construction and whole life cost of built assets
- 50% reduction in the overall time from inception to completion for new build and refurbished assets
- 50% reduction in greenhouse emissions in the built environment
- 50% reduction in the trade gap for construction products and materials

The programme underpins and enables the realisation of the Government's policy objectives.

Info@eubim.eu

#### Funding and an implementation team

The digital transformation of the public estate and the construction industry of approximately 3 million people is a large change programme requiring resources, a clear plan and a dedicated team to drive forward.

The strategy identified a clear value to the UK in terms of public savings on construction; and a clear benefit to the industry sector – in terms of higher levels of productivity and competitiveness. This value proposition unlocked a modest sum of funding to support the activities of the programme team.

#### WHAT LESSONS CAN BE LEARNED?

##### Progressive roadmap

The UK Government's BIM mandate required the supply chain to progressively develop their BIM capability. By setting a long term target (of five years) this provided sufficient time for the industry to adapt its processes and increase training and skills.

##### Freely available standards and tools

The UK BIM Task Group also made freely available the British Standards and the Publicly Available Specifications along with the legal addendum (called the "BIM Protocol").

##### Challenges

The largest challenge has been the up-skilling of Tier 2, Tier 3 etc suppliers. However, recent efforts are making progress in this area, for example, the Construction Products Association and Lexicon is helping manufacturers to respond to the BIM opportunity.

#### FURTHER INFORMATION

The UK Government's Construction 2011 and 2025 policy documents and the Government Construction Strategy 2016-2020 can be found using the following links:

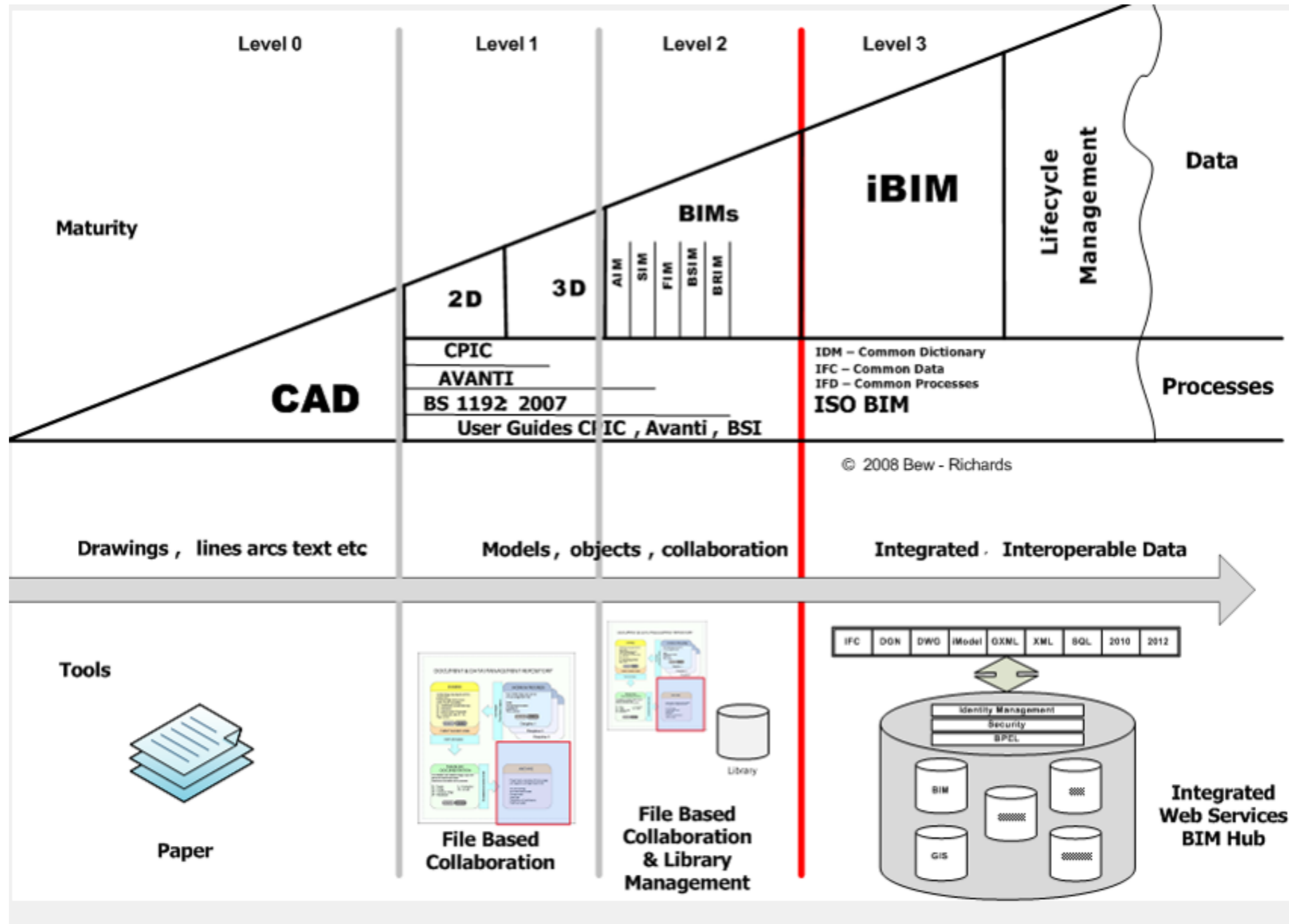
- <http://bim-level2.org/en/>
- [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/61152/Government-ConstructionStrategy\\_0.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/61152/Government-ConstructionStrategy_0.pdf)
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- [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/510354/Government\\_Construction\\_Strategy\\_2016-20.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/510354/Government_Construction_Strategy_2016-20.pdf)

Outputs achieved from implementing the UK Government's Construction 2011 policy are published on the Cabinet Office website and can be accessed using the following link:

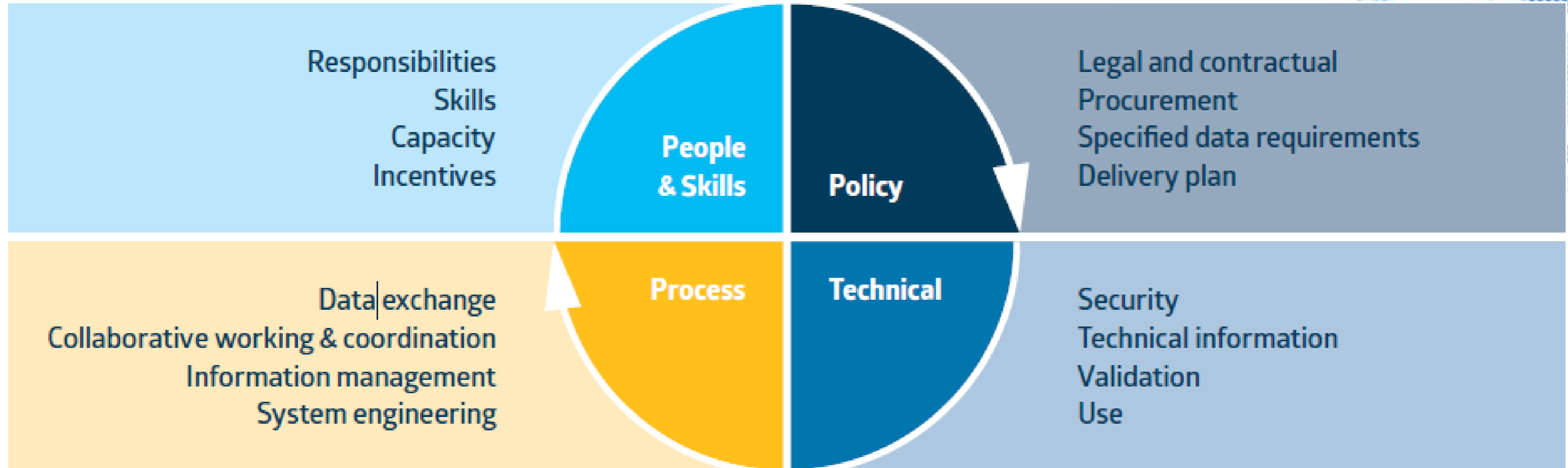
- [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/466952/20150825\\_Annex\\_A\\_Departmental\\_Cost\\_Benchmarks\\_Cost\\_Reduction\\_Trajectories\\_and\\_Cost\\_Reductions\\_2015\\_Final\\_Draft.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/466952/20150825_Annex_A_Departmental_Cost_Benchmarks_Cost_Reduction_Trajectories_and_Cost_Reductions_2015_Final_Draft.pdf)

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# Common EU BIM Performance Level



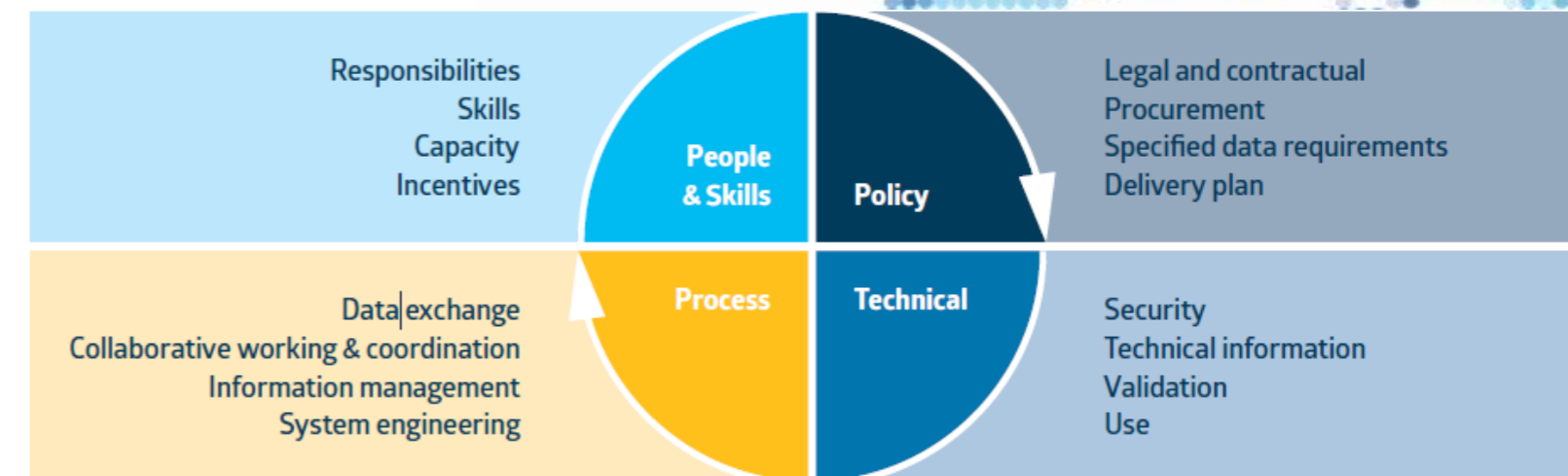




# Common EU BIM Performance Level



Definition Area	Characteristics high level description
Policy	<ul style="list-style-type: none"> <li>Commercial, legal and contractual matters are agreed and documented in an appropriate format and become part of the contractual arrangements between the parties involved.</li> <li>The tender process includes an appropriate assessment of the supplier's capability, capacity and willingness to deliver the BIM requirements.</li> <li>Information requirements associated with a construction project are specified and expressed in terms of the project stages that the project client or the supply chain intends to use. The fundamental principle of avoiding over-generation and over-processing of data should be applied through the specified information requirements.</li> <li>Details on how the information requirements will be met and delivered are agreed and documented in an appropriate format.</li> </ul>
Technical	<ul style="list-style-type: none"> <li>The information requirements specify data to be provided in vendor-neutral, non-proprietary formats.</li> <li>An object-oriented approach forms the basic principle of specifying, modelling and organising data</li> </ul>
Process	<ul style="list-style-type: none"> <li>The information planning and delivery processes require container-based and collaborative working principles.</li> <li>A Common Data Environment (CDE) is required as a means of providing a secure and collaborative environment for sharing work.</li> <li>System engineering tools and methods are required to encompass holistically all needs and requirements of all stakeholders in a comprehensive manner covering all architectural visions – operational, functional, organic – for all states of the built assets along its lifecycle, and to structure properly all information.</li> </ul>
People	<ul style="list-style-type: none"> <li>Responsibility for data and information management is assigned in accordance with the complexity of the project.</li> </ul>







## POLICY CRITERIA 3 BIM CAPABILITY CRITERIA

### What is it?

In the tender process before contract award, the contracting party evaluates the suppliers' capabilities and capacity to the extent necessary for them to be considered appropriate to undertake work and deliver services for potential buyers. The assessment of BIM related capability and capacity in relation to BIM, industry standards and the contracting party's information requirements includes the commitment and the experience of the contracted party as a whole and of the proposed team, access to and experience of the information technology specified or envisaged as well as the quantity of experienced and suitably equipped personnel within the contracted party with availability to work on the proposed project.

### Why is it important?

Assessing the BIM capability and capacity, but equally important the commitment and willingness of a bidder to comply with the BIM process and the information requirements set out by the contracting party, are crucial for the successful delivery of a BIM project. The capability criteria are also required in order to change the procurement process from a purely lowest price driven decision to one that provides robust and objective quality assessment criteria.

Importantly, the capability criteria is designed to be non-discriminatory and encourages the widest participation possible (for example, to be inclusive of SMEs).

### What are the recommendations?

	Highly Recommended	Recommended	
BIM capability criteria	The assessment of contracted party capability and capacity should include assessment of the highly-recommended activities provided in this document and the bidders commitment to comply with the relevant standards, this guide and the contracting party's information requirements.	Whilst practical BIM experience is still limited in some regions and markets, the assessment criteria should not exclude a large proportion of suppliers, otherwise there might not be sufficient capacity in the market.	Apply BIM capability criteria that can be assessed objectively. Each question can have two parts – first a yes / no response, for example does the supply chain do something / have capacity. Second half is details of what the supply can do / how they do it.

## CASE STUDY

### E4 Stockholm Bypass, Sweden

**Framework / Performance Criteria:** Performance Criteria

**Topic:** BIM Capability Criteria

**Recommendation:** The assessment of contracted party capability and capacity should include assessment of the highly-recommended activities provided in this document and the bidders commitment to comply with the relevant standards, this guide and the contracting party's information requirements

#### CONTEXT

The E4 Stockholm Bypass project used BIM capability as qualification criteria. During the pre-qualification stage, the tenderer were required to present the technical and professional capability required to deliver the requested services. Several relevant capability criteria were provided and requested by the client.

#### WHY WAS IT DONE AS DESCRIBED?

In the Stockholm Bypass Project, the Swedish Transport Administration is implementing an initiative to streamline the construction sector by promoting the broad use of Building Information Modelling (BIM) for all disciplines. 3D models will replace traditional 2D drawings in the future. The envisaged benefits of a wider use of 3D models are fewer drawings, improved design coordination as well as better quality of construction and hand-over documents and processes.

The contractual deliverables on the Stockholm Bypass project will be 3D models supplemented by drawing. As-built documentation must be delivered by the contractors in the form of 3D models.

For the Stockholm Bypass to succeed in this initiative, the successful bidders need to demonstrate that they have the required capacity, capability and willingness to deliver to these requirements.

#### WHAT LESSONS CAN BE LEARNED?

All bidders demonstrated sufficient relevant experience to be accepted. It was clear that they had all understood the importance of BIM-capability to succeed on the project.







## PEOPLE AND SKILLS ASSIGN RESPONSIBILITY FOR DATA AND INFORMATION MANAGEMENT

### What is it?

Clarity of roles, responsibility, authority and the scope of any task are an essential aspect of effective information management. For smaller or less complex assets or projects, information management roles may be performed alongside other roles – asset manager, project manager, design team leader, principal contractor, etc. Key to the allocation of roles, responsibility and authority is the appropriateness and ability of the organization to be able to fulfil the requirements of the role<sup>15</sup>.

### Why is it important?

The importance and complexity of project and asset information management activities and responsibilities are often underestimated. Every single person working on a construction project requires and generates an enormous amount of data and information. This is not limited to models and drawings. It includes all types of project data, for example schedules, emails, photographs, specifications, etc. Choosing and implementing the most efficient and appropriate technical solution that best supports the processes, security and other requirements as well as the needs of the people with the data, is not a trivial task.

### What are the recommendations?

	Highly Recommended	Recommended	Encouraged
Assign responsibility for data and information management	<p>Responsibilities for data and information management should be assigned to competent and qualified individuals</p> <p>Information management roles should not refer to design responsibilities.</p>	<p>Resourcing of data and information management responsibilities should be proportionate to the size and complexity of the project</p>	<p>Task-based role definition: identifying the information needs, related tasks and required workflows form the basis to fill the roles needed for any contract appropriately</p>

## CASE STUDY



### Es.BIM initiative

**Framework / Performance Criteria:** Performance Criteria

**Topic:** Assign responsibility for data and information management

**Recommendation:** Responsibilities for data and information management should be assigned to competent and qualified individuals. Information management roles should not refer to design responsibilities

#### CONTEXT

The Es.BIM initiative has been organized around specific tasks groups. One of them (Group 2.3) oversees the definition of specific roles in a BIM environment. Different project types and their corresponding delivery stages were identified and considered.

At the same time, a thorough review of existing international rules, standards and common practices was carried out to gather and summarize the current situation around BIM related roles and responsibilities in different countries. The international review was then compared with the current situation in the Spanish AEC Industry and recommendations for changes to the traditional roles as well as identification of new tasks were developed for different types of projects at different stages.

#### WHY WAS IT DONE AS DESCRIBED?

The BIM process puts a much higher attention on activities around data and information management than the traditional approach on construction projects. This change needs to be reflected in the relevant roles and responsibilities; relevant tasks must be defined and it must be clear which role they correspond to. In order to develop and provide a document that can consistently be used by owners, employers and suppliers alike, the Spanish initiative saw it as important to assess which roles or functions are necessary during the different stages of the building or infrastructure lifecycle.

There is currently no single international standard for roles and responsibilities on a "BIM project". By analyzing existing documentation and best practice from different countries and international standards, the Spanish initiative tried to benefit from the larger experience of BIM implementation in other places all over the world. At the same time, given the fact that some of the responsibilities and related liability in projects in Spain are regulated by law, it was necessary to adapt the findings to match the existing legal framework in Spain.

#### WHAT LESSONS CAN BE LEARNED?

The first version of the document developed by group 2.3 of the Spanish BIM initiative suggests several modifications of the existing roles and responsibilities on a construction project, aimed to:

- define more specific tasks related to data and information management, since some of them are far too general to serve as a guide
- revise some of the roles and describe the responsibilities more clearly. This will allow to identify interdependencies / overlaps, especially in cases where design quality responsibilities were mixed up with data quality tasks and responsibilities.
- link tasks more clearly to delivery stages,
- link roles more clearly to project types

It is envisaged that future versions of the document will include further details, especially when the ISO 19650 standard, which defines relevant roles and responsibilities, gets adopted at CEN to become a European standard.

#### FURTHER INFORMATION

- The following link provides further background information:
- <http://www.esbim.es/descargas/>





## Reality's next?

### SUPPORT FOR THE DEVELOPMENT AND CAPABILITY BUILDING OF THE EU BIM FRAMEWORK

(2018)

The purpose of this call is to request services for a 12-month period for a total budget of **max. 60k€ (low value contract)** in relation to the capability and capacity building as well as the further development of the EU BIM framework elaborated in the BIM Handbook (exact title: *Handbook for the Introduction of Building Information Modelling by the European Public Sector*). This should be carried out by the contractor by developing and providing awareness raising training or consulting work on the EU BIM Framework for groups of (e.g. public) stakeholders. This contract runs in parallel to two other Commission-financed contracts: one published in parallel to this contract that will provide communication actions around the EU BIM framework and the other to cover logistics support for meetings of the EU BIM Task Group. The latter contract is already engaged.





Bringing together national efforts into a common and aligned European approach to develop a world-class digital construction sector

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**Cita**  
BIM GATHERING



# Thank you

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Presenters name