

Digital Construction

Building the present – Creating the Future

Changing the way we create our built environment



Menno de Jonge
Director Digital Construction

CitA BIM Gathering – Dublin, Ireland – 23 November 2017

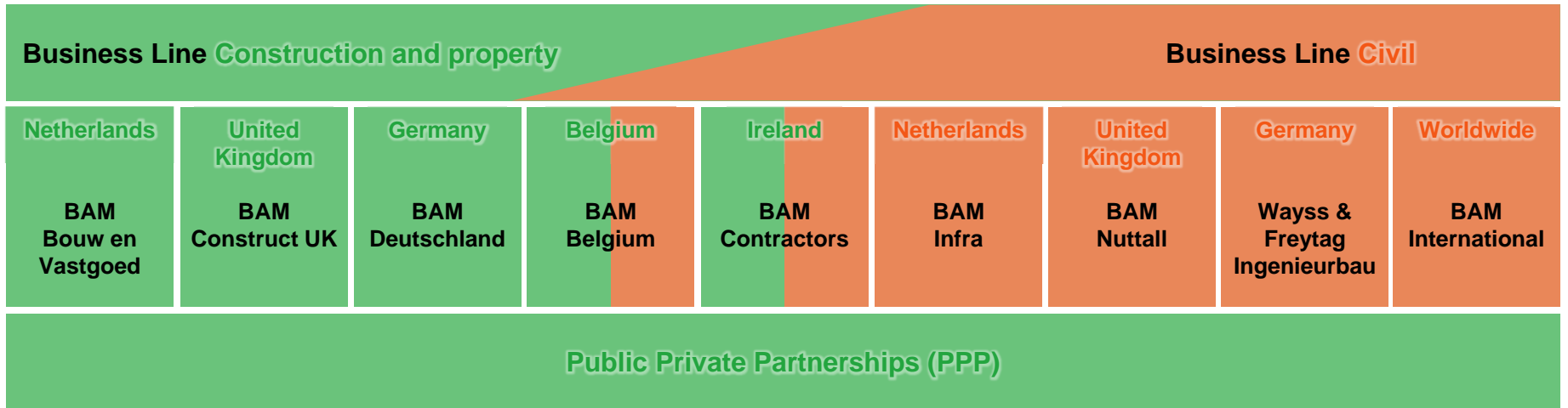
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 [@mfdejonge](https://twitter.com/mfdejonge)

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Introduction to Royal BAM Group

BAM Leader in Digital Construction



Revenue
(2016)
€6,976 Million

Result
(2016)
€102.7 Million
(1,5%)

Order book
(2016)
€10,193 Million

Employees
(2016)
20,370 (fte)

Revenue sector / geography

% of gross total revenue 2016

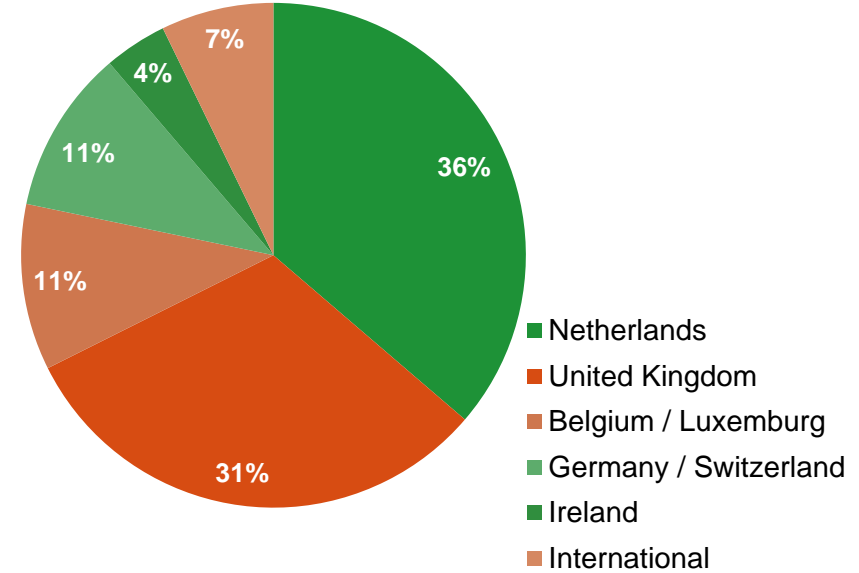
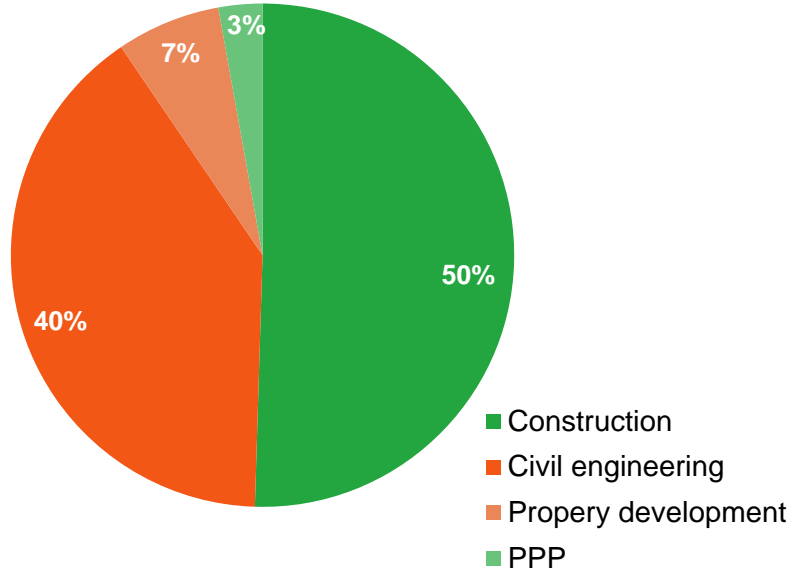


Image courtesy of Royal BAM Group

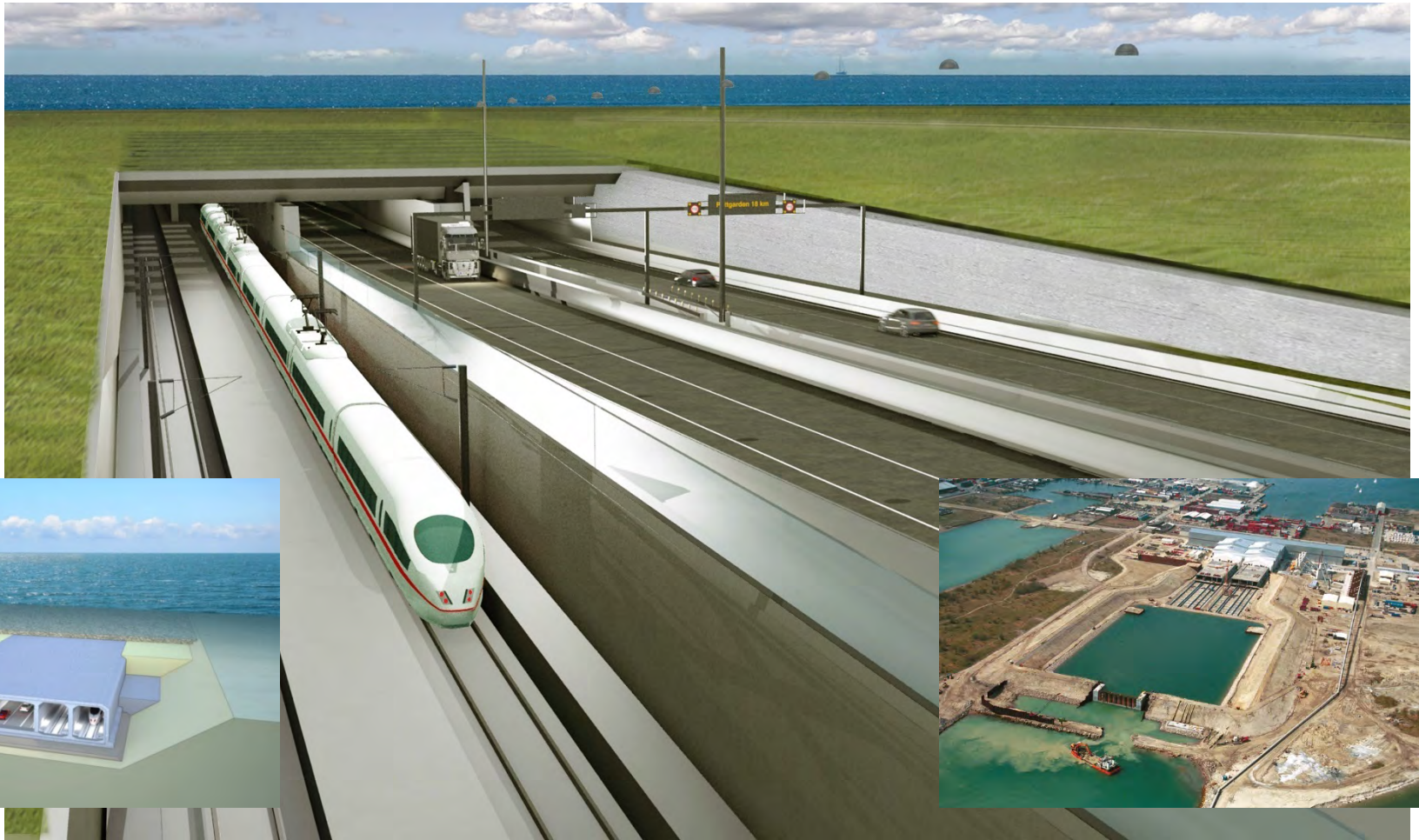
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Art Depot Museum Boijmans van Beuningen – Rotterdam – The Netherlands

Image courtesy of Royal BAM Group

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Fehmarnbelt tunnel – Linking Germany and Denmark

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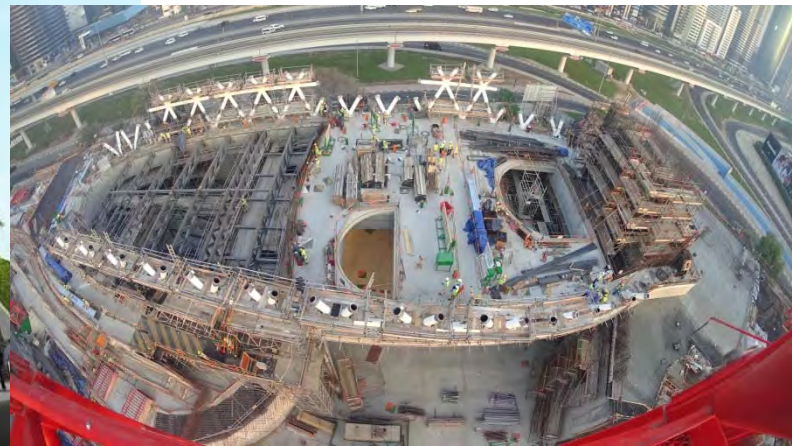
Antarctic Research Facilities – British Antarctic Survey - Antarctica

Image courtesy of Royal BAM Group

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Museum of the Future
Dubai, UAE



Museum of the Future – Dubai – United Arab Emirates

Image courtesy of Royal BAM Group

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Sea lock North Sea Canal – IJmuiden – The Netherlands

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Victoria & Albert Museum of Design – Dundee – Scotland

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Children's Hospital – Dublin – Ireland

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Why ?

The world of construction is changing

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Construction represents

6%

of global GDP

Source: World Economic Forum²

In the UK, every £1 invested in construction delivers £2.84 of **economic activity**



Source: LEK Consulting³



By 2030, worldwide **construction output** is forecast to reach \$17.5Tn (\$2014), some 85% greater than 2014 levels

Source: Global Construction 2030⁴

Source Autodesk Construction Manifesto (April 2017)

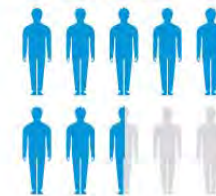
There are up to

180 million

construction workers worldwide



75%

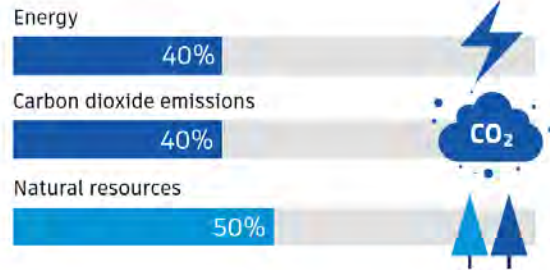


are in developing countries

Source: Building and Woodworkers International, accessed <http://www.bwint.org/pdfs/WCProcurementFiona.pdf>

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Today, our **built environment** utilises the world's:



Source: Global Construction 2030*

Average global construction **project margins** fell from an already low 6.3% in 2015 to

6.1%
in 2016



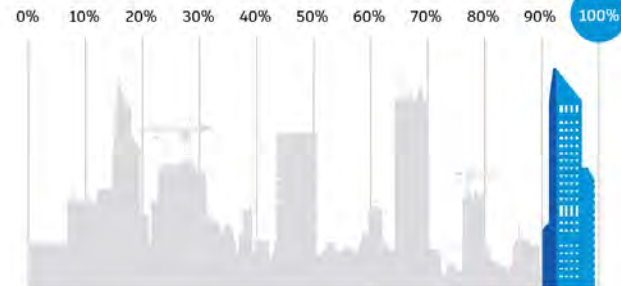
Source: Turner and Townsend International Construction Market Survey 2016



Skills shortage is common in many construction markets, with only the above **four** having excess labour due a downturn in those markets

Source: Turner and Townsend International Construction Market Survey 2016

Source Autodesk Construction Manifesto (April 2017)



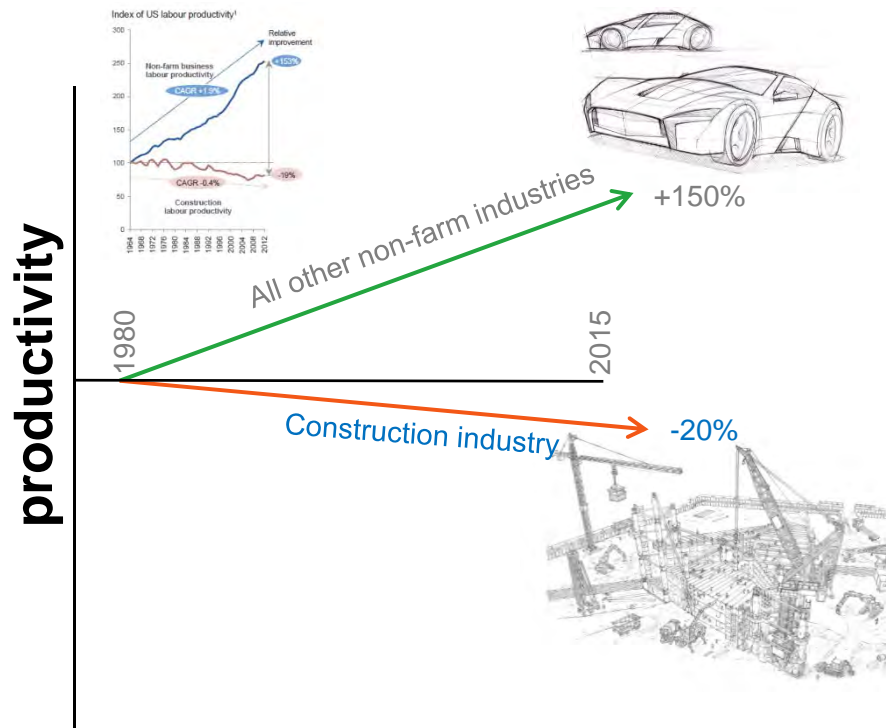
Just a **quarter** of construction projects in the last three years came **within 10%** of their original deadlines

Source: KPMG, Climbing the Curve, 2015 Global Construction Project Owner's Survey

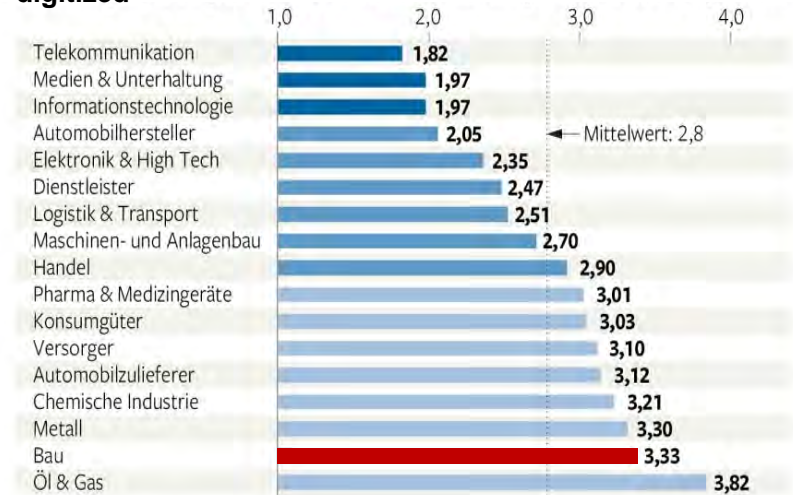
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The construction sector

Declining productivity and low degree of digitalisation



Scale: 1 = mostly, 2 = partly, 3 = very little, 4 = rudimentary digitized

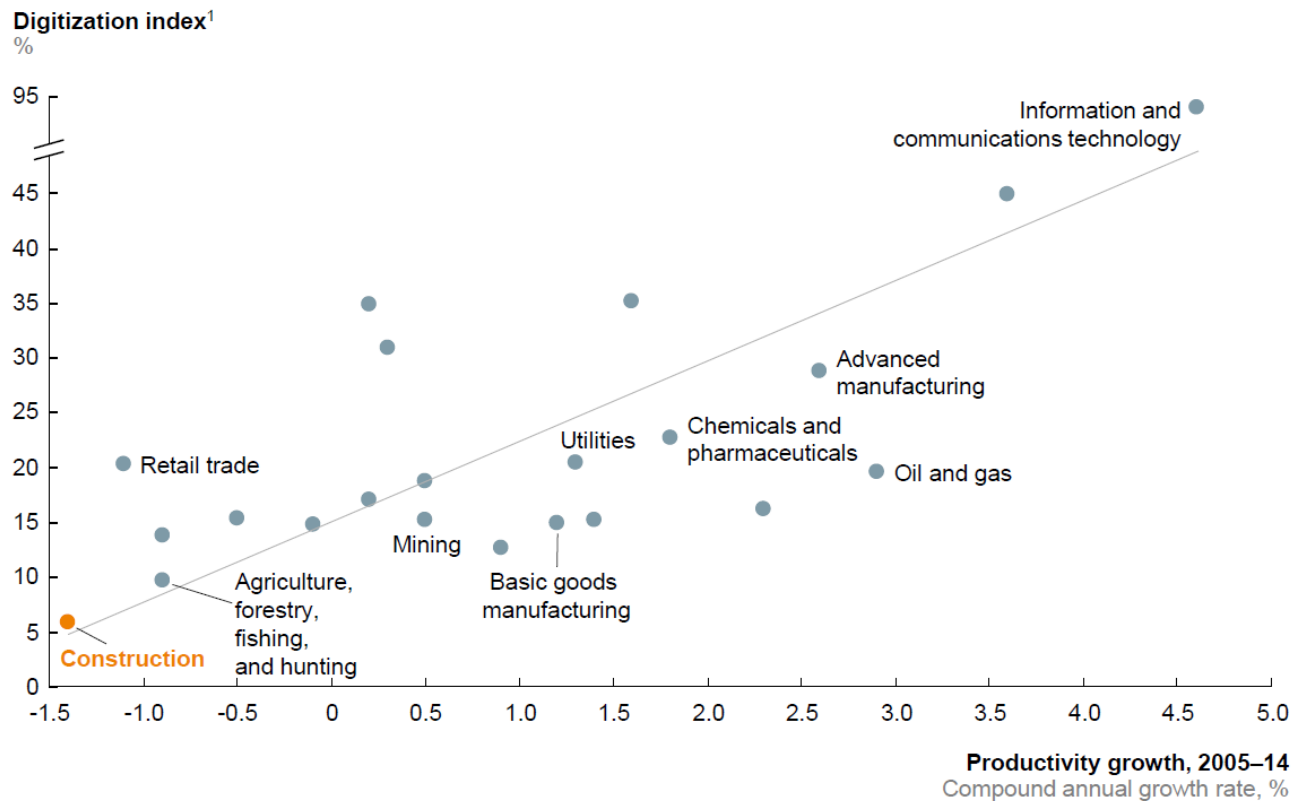


QUELLE: TOP 500 STUDIE 2014/ accenture

Construction Sector

Lower digitalization leads to Lower productivity

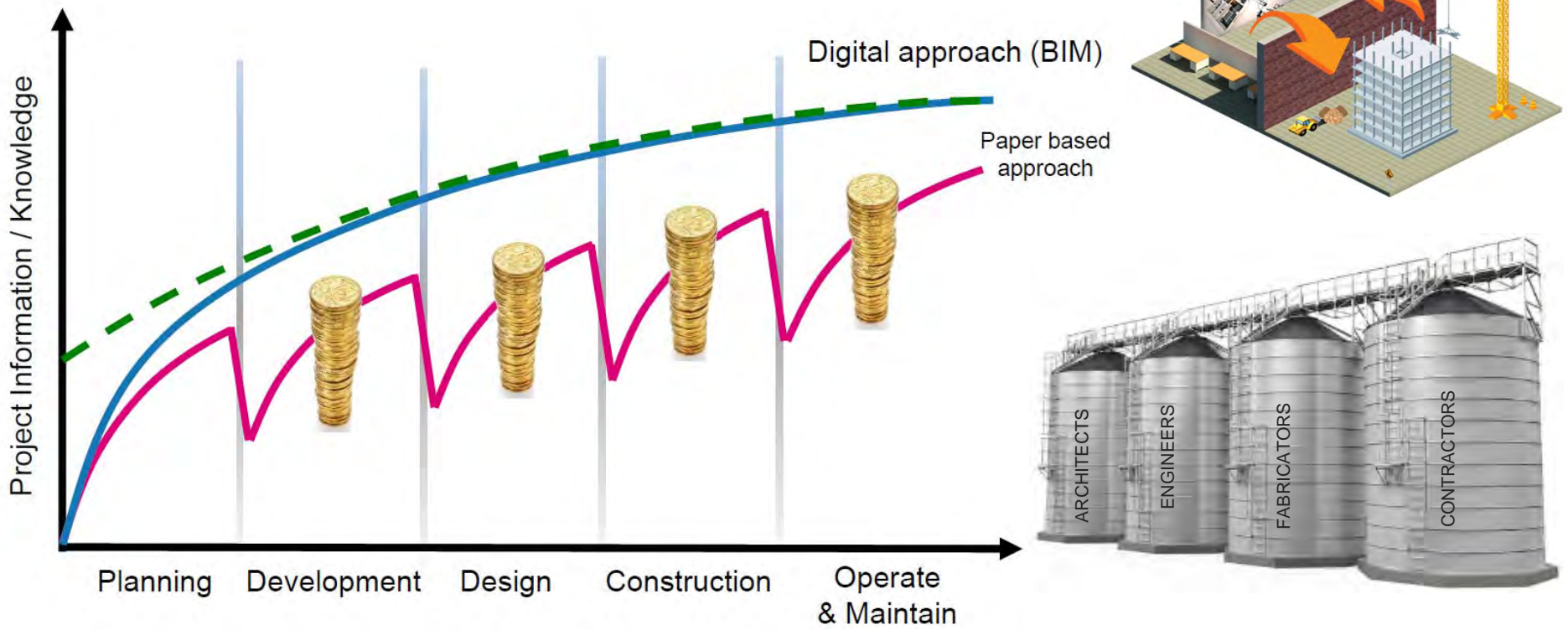
Lower digitization in construction relative to other industries has contributed to the productivity decline



Source McKinsey Global Institute – Reinventing Construction (feb 2017)

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Adding value



Source Royal BAM Group, Boston Consulting Group

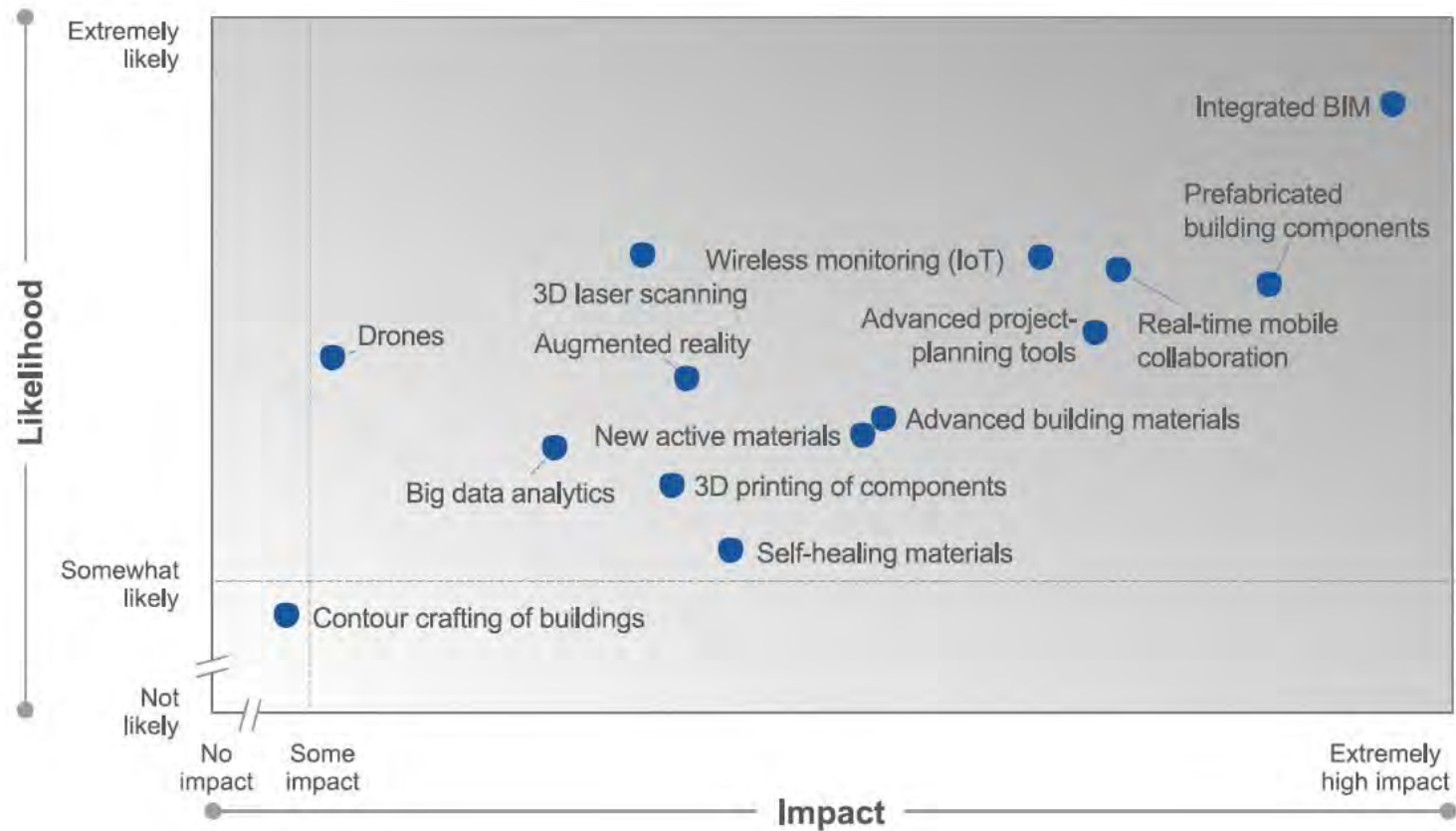
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By 2025, “full-scale digitalization... will lead to annual global cost savings of 13% to 21% in the design, engineering and construction phases and 10% to 17% in the operations phase”

BCG (The Boston Consulting Group)

‘Digital in Engineering and Construction:
The Transformative Power of Building
Information Modeling’ 2016

Impact likelihood matrix of new technologies



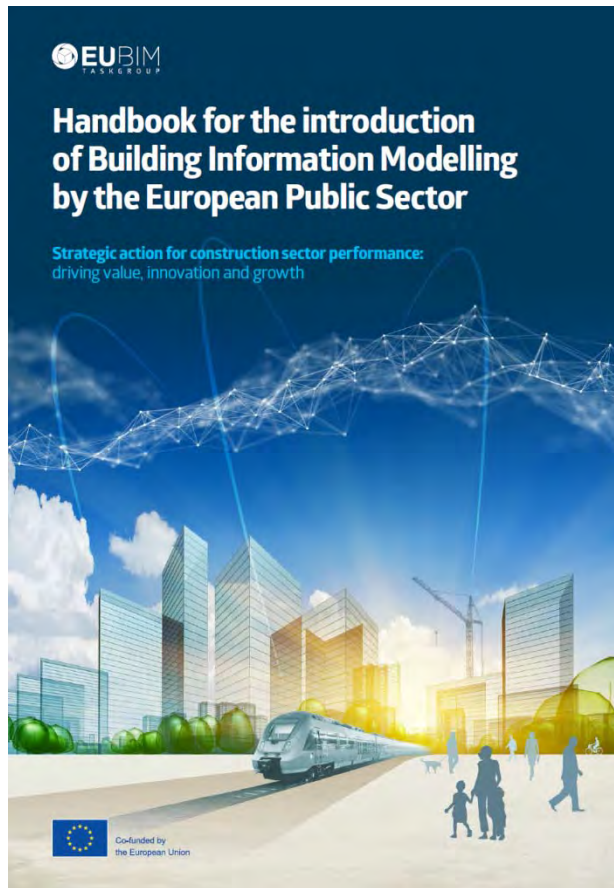
Source WEF – Shaping the future of Construction (May 2016)

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Rapidly evolving national digital programmes

Rapidly evolving national digital programmes			
Germany		Norway	
Finland		Spain	
France		UK	
Netherlands		Denmark	

Others including; Ireland, Sweden, Estonia and Lithuania



Source EU BIM Taskgroup

3.1.1

Action Recommendations Strategic Recommendations

Establish public leadership

The public sector BIM programme is not usually a standalone action isolated from other organisational activities. It would normally connect and support other goals and strategies. To ensure the programme has a strong foundation it starts by clearly defining:

- why BIM is relevant to the organisation or to the sector
- the scope of the programme and how it relates to other initiatives
- objectives and a strategy for achieving the stated goals
- a long-term commitment to encouraging the shift to a digital construction sector

PUBLIC LEADERSHIP ACTION 1 DEFINE COMPELLING DRIVERS, A VISION AND GOALS

What is the action?

Establish public leadership by first defining compelling drivers, a clear vision and specific goals. These are often the first steps taken by public sector organisations to establish a base for the concerted action of a BIM programme. In order to:

- define what is motivating the public organisation to taking public leadership for the encouragement of BIM to its public estate
- describe what the future will look like by taking the action
- specify the measures and targets that will be improved by the programme
- make a public statement of intent to provide leadership and encouragement to industry
- increase the competences of the public owner/procuree/manager acting as the client organisation

Why is the action important?

The combined effort of this action is important and needed for:

- building support within the public sector organisation to allow funding and the necessary resources to be committed
- building alignment for a common direction between stakeholders across the public and private sector
- creating focus on the outcomes expected by taking action

What are the recommendations?

	Highly recommended	Recommended	Encouraged
Vision, Drivers & Goals	Develop clear public drivers and goals, and define and document them.	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.	Define organisational level metrics that address the drivers and describe progress towards the goals. Benchmark the starting point and measure progress throughout.

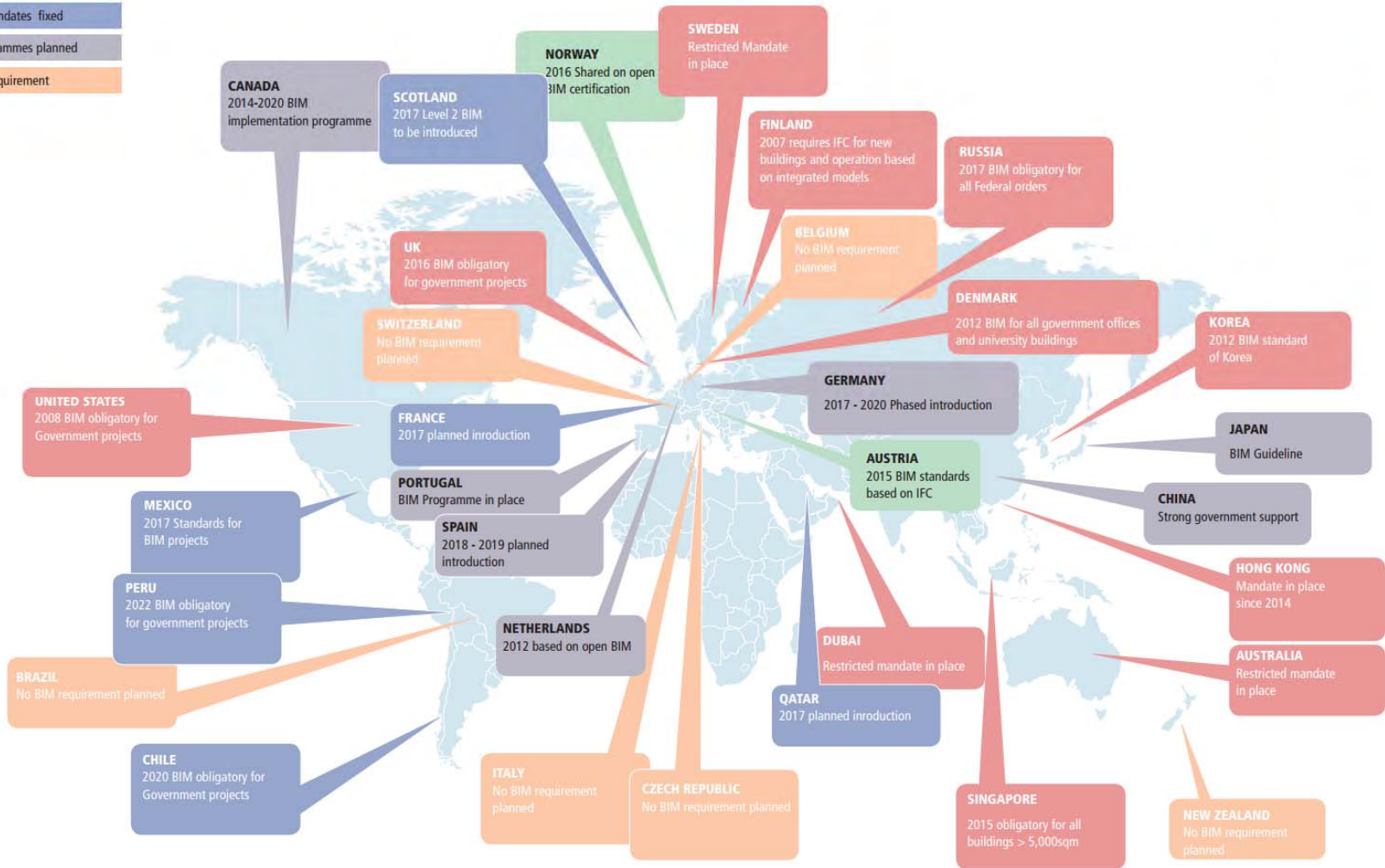
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- Open BIM Standards & Mandate
- Mandates in place
- Future Mandates fixed
- BIM Programmes planned
- No BIM requirement



Source Global BIM Report, CitA Ireland, February 2017

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How ?

Royal BAM Group is playing a leading role

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Potential for improvement

- Increase insight during whole lifecycle of project
- Integrated design of projects / products
- Increase efficiency
- Reduce failure costs
- Increase predictability
- Reduce number of change orders
- Increase safety
- Increase value for all stakeholders

“The best way to predict
the future is to create it”

Abraham Lincoln

“We create the future
using digital ...”

Royal BAM Group

“we make it before we make it”
(digital first, physical next)

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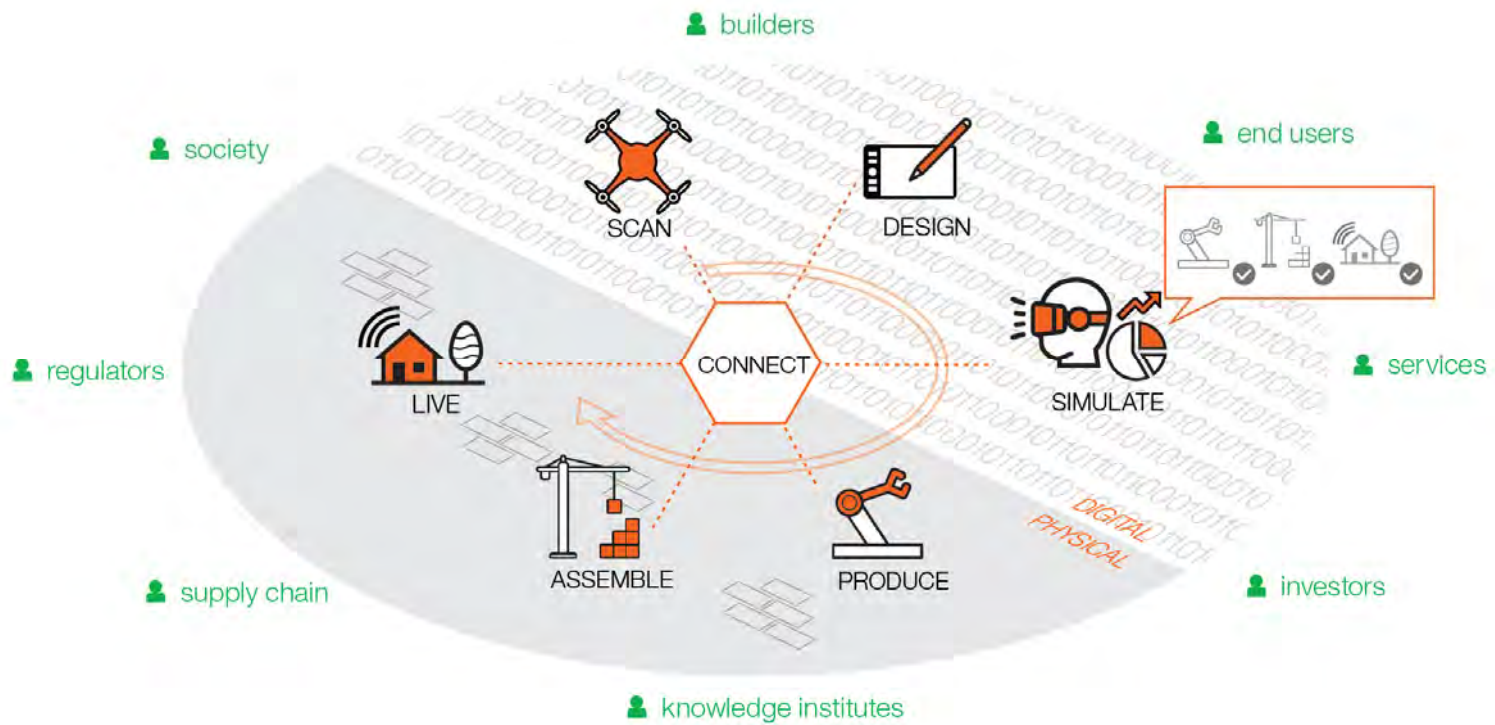
What ?

It's happening now
we're in the middle
of it

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Royal BAM Group's Digital Transformation

an integrated multi-stakeholder approach



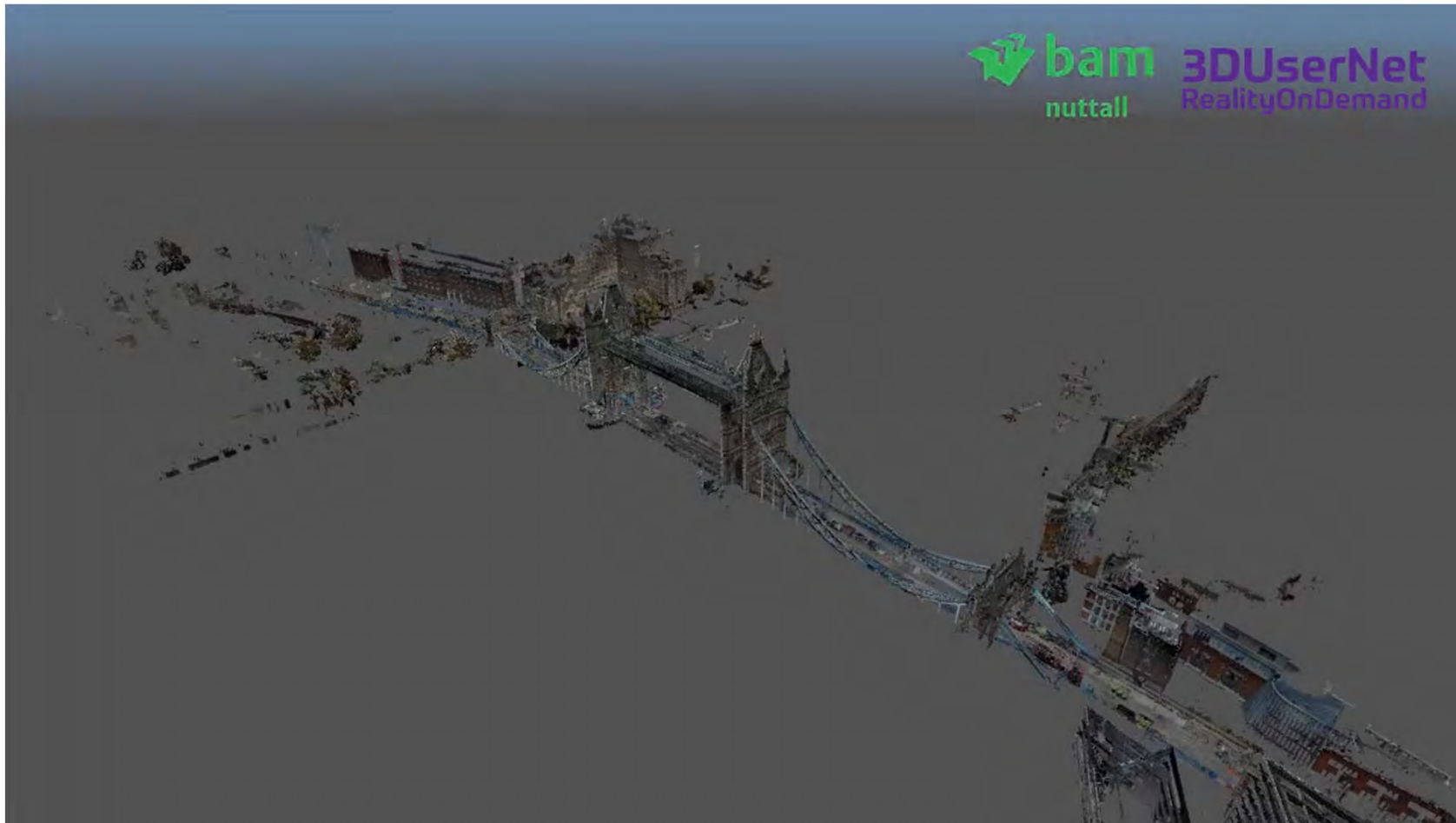


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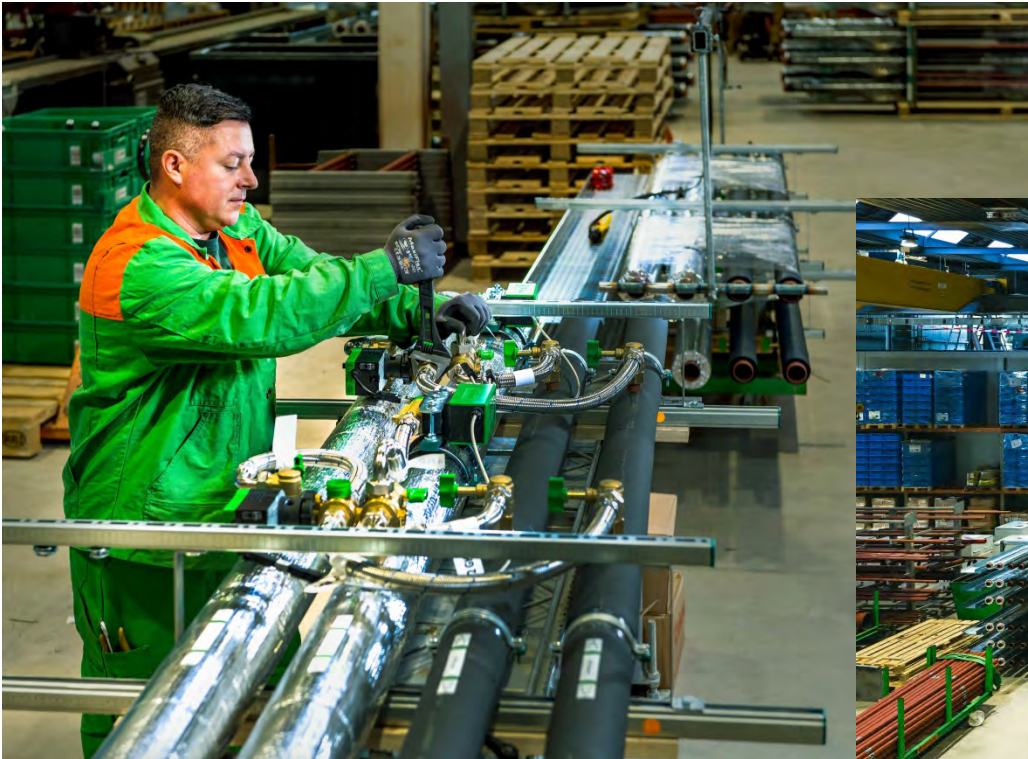
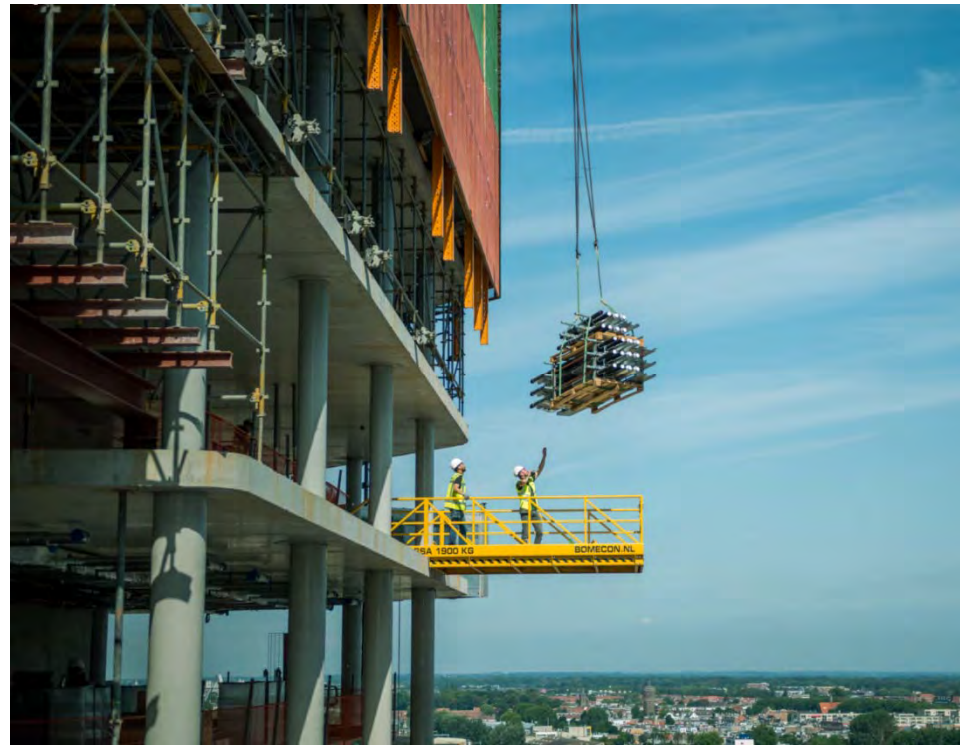


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Digital construction at BAM

BAM is fully embracing digital ways of working.

We are using technological innovations such as BIM, robotics, 3D printing, virtual and augmented reality and modular/offsite construction, to enable us to build digitally before building on site.



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