

# A digital wave in construction – can we ride it to better productivity and outcomes?

BY:

FRANK VON WILLERT, SENIOR PRACTICE MANAGER MAJOR PROJECTS  
MCKINSEY & COMPANY

# Have we lost critical skills over the past 80 years?

## Empire State Building (1931)

- 102 floors
- 381m
- 209.000 m<sup>2</sup>

### Costs

- \$350-600 million
- \$2.000-3.000/m<sup>2</sup>

### Construction time

- 410 days

~~Computer,  
3D model,  
P6, BIM, PDF,  
email~~



## 1 World Trade Centre (2013)

- 104 floors
- 415m
- 270.000 m<sup>2</sup>

### Costs

- \$3.900 million
- \$14.000/m<sup>2</sup>

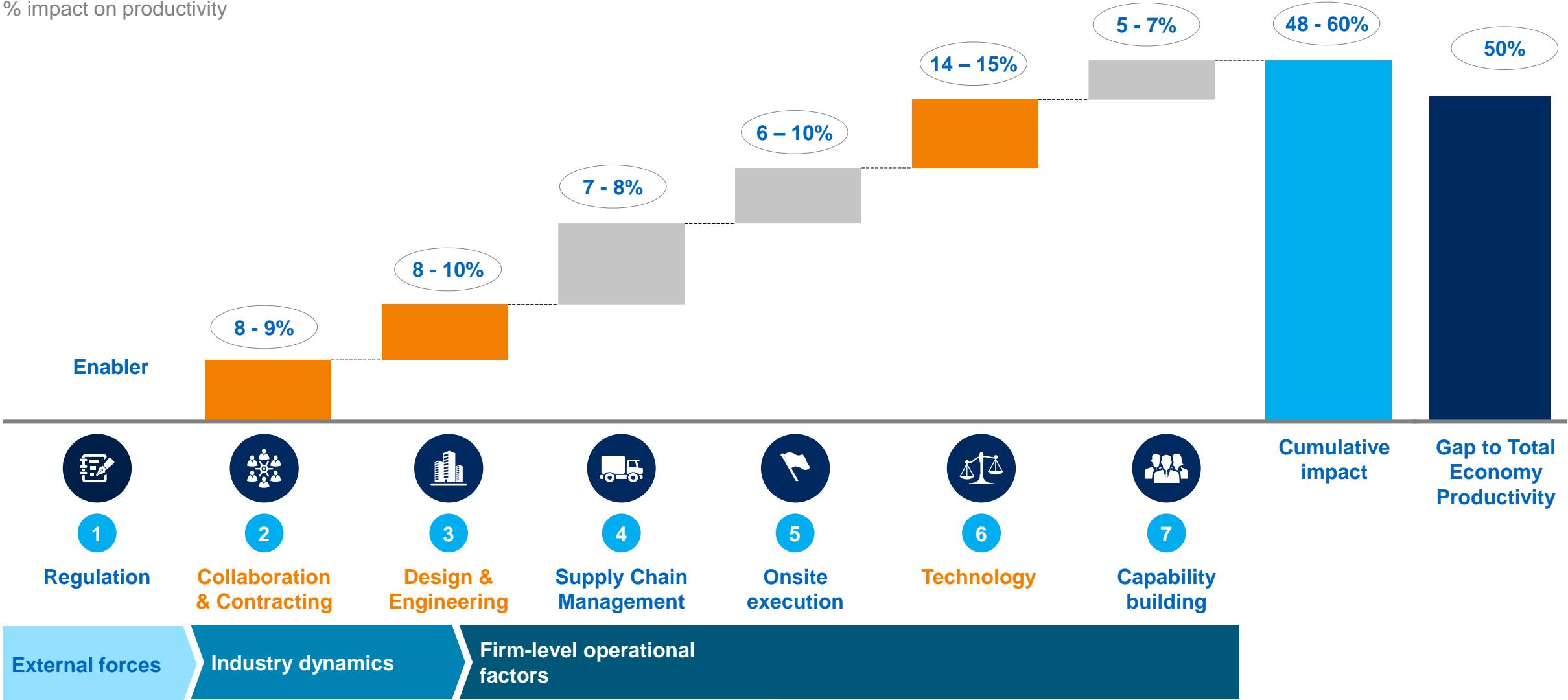
### Construction time

- 3112 days

Computer,  
3D model,  
P6, BIM, PDF,  
email

# 7 key levers were identified that could improve productivity by 50-60% - Technology being the biggest

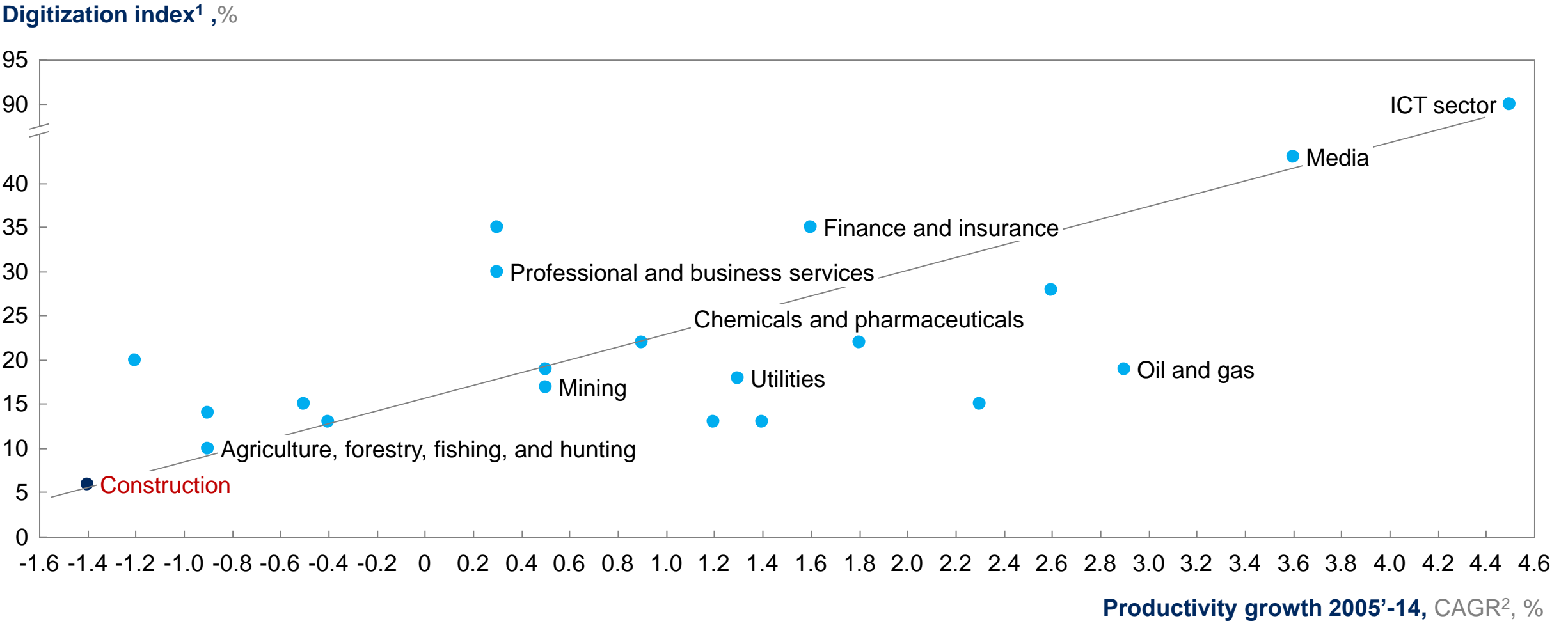
Potential global productivity improvement<sup>1</sup> from implementation of best practice  
% impact on productivity



<sup>1</sup> The impact numbers have been scaled down from a best case project number to reflect current levels of adoption and applicability across projects, based on respondents to the McKinsey & Co Global Construction Industry Productivity survey who responded agree or strongly agree to the questions around implementation of the solutions

# Productivity and digitization are correlated – and construction is at the low end

Digitization (2015 or latest) vs. Productivity of US industries, %

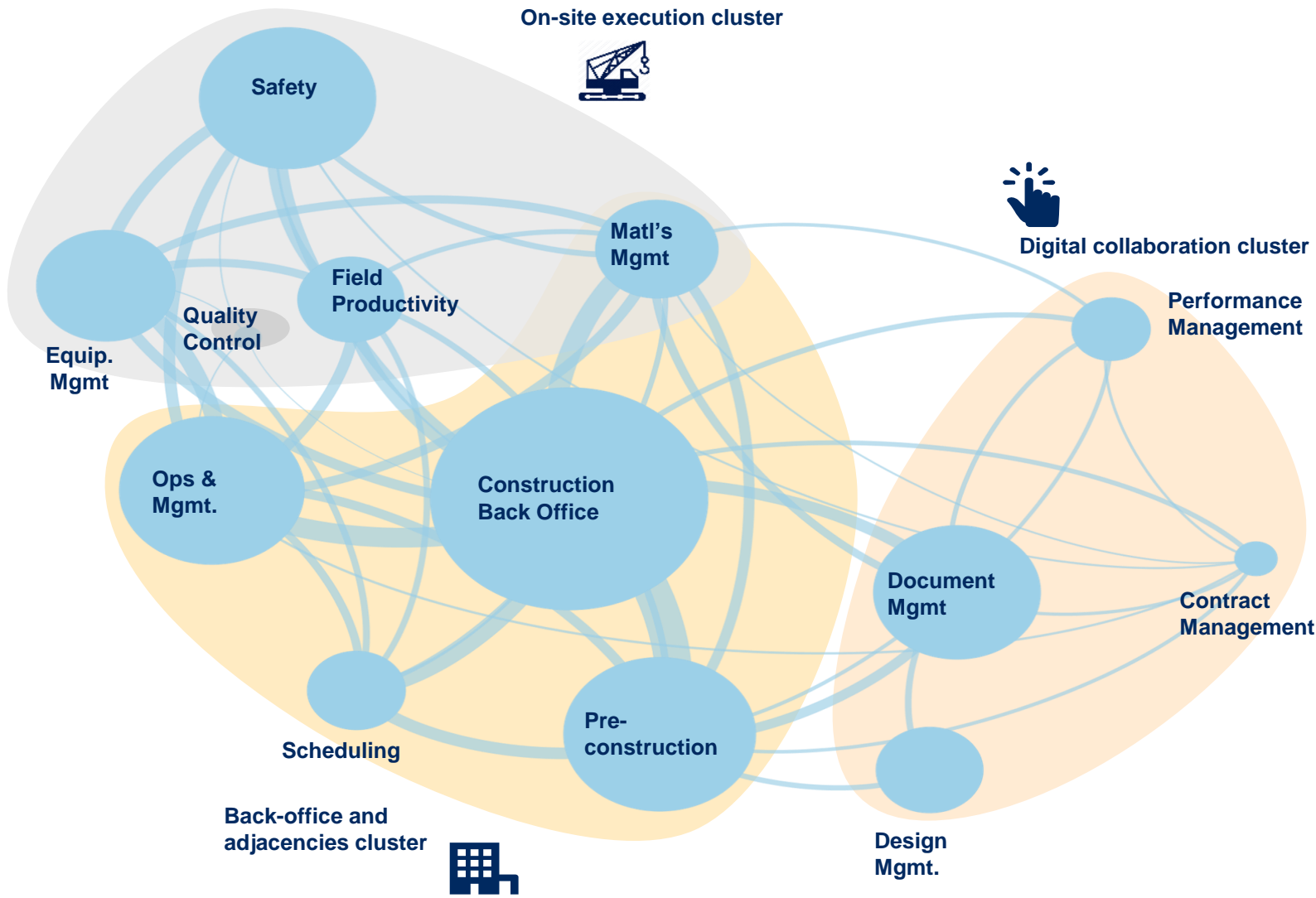


1 Based on a set of metrics to assess digitization of assets (8 metrics), usage (11 metrics), and labor (8 metrics) 2 Compound annual growth rate,  
3 Based on data of top 20 E&C companies by market value globally

SOURCE: BEA; BLS; US Census; IDC; Gartner; McKinsey social technology survey; McKinsey payments map; Livechat customer satisfaction report; Appbrian; US contact center decision – makers guide; eMarketer; Bluewolf; Computer Economics; industry expert interviews; McKinsey global institute analysis, Capital IQ, Gartner IT key metrics data 2012

# A year ago we mapped the construction technology landscape uncovering 3 clusters of innovation ...

~1,000 firms in the construction phase

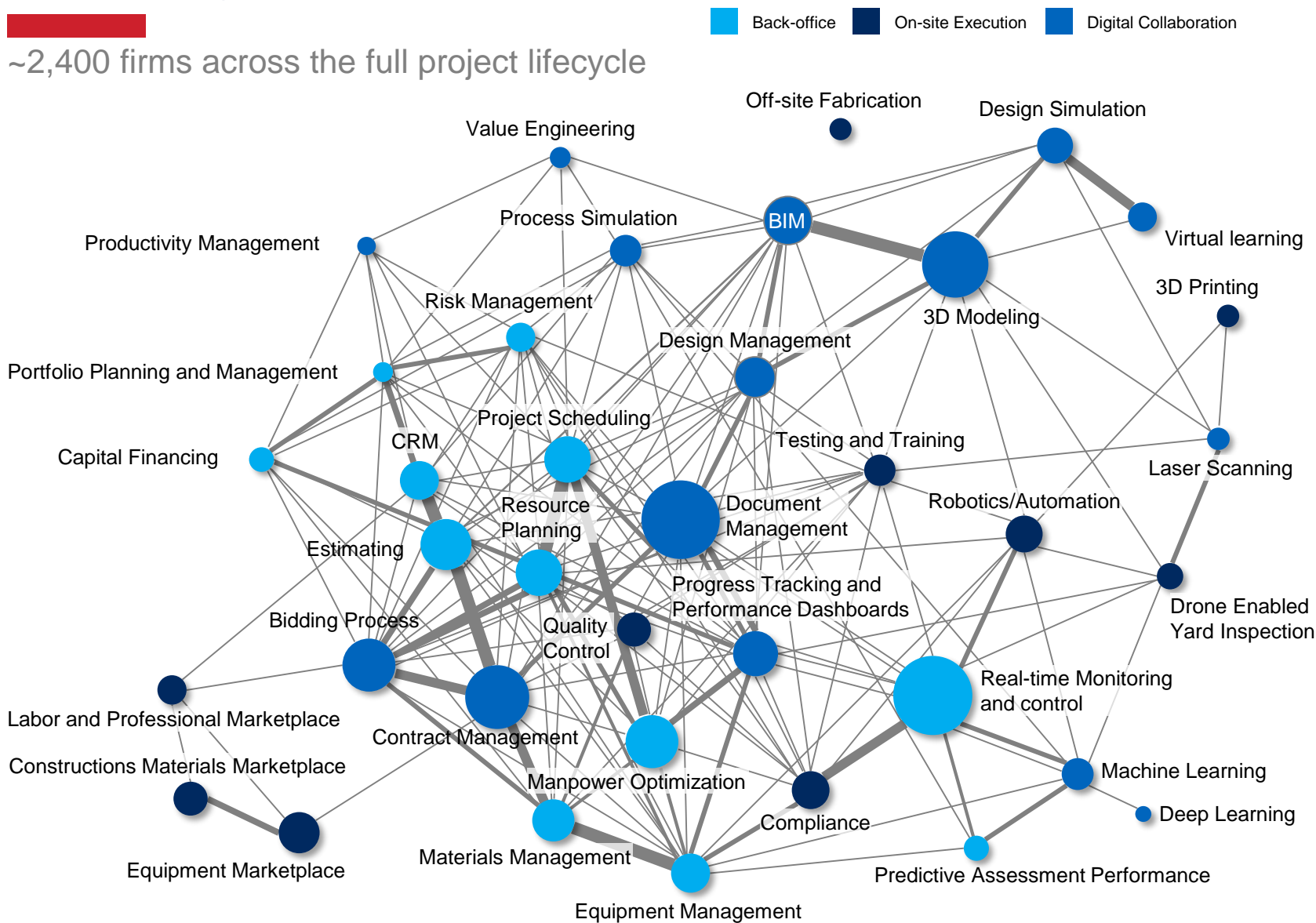


2017	
Firms	1000
Clusters	3
Investment	\$10B
Geo center of gravity	North America 70%



# A year later, the ecosystem looks very different with exciting movement

~2,400 firms across the full project lifecycle



2018

Firms



2400

Clusters



Constellations

Investment



\$18B

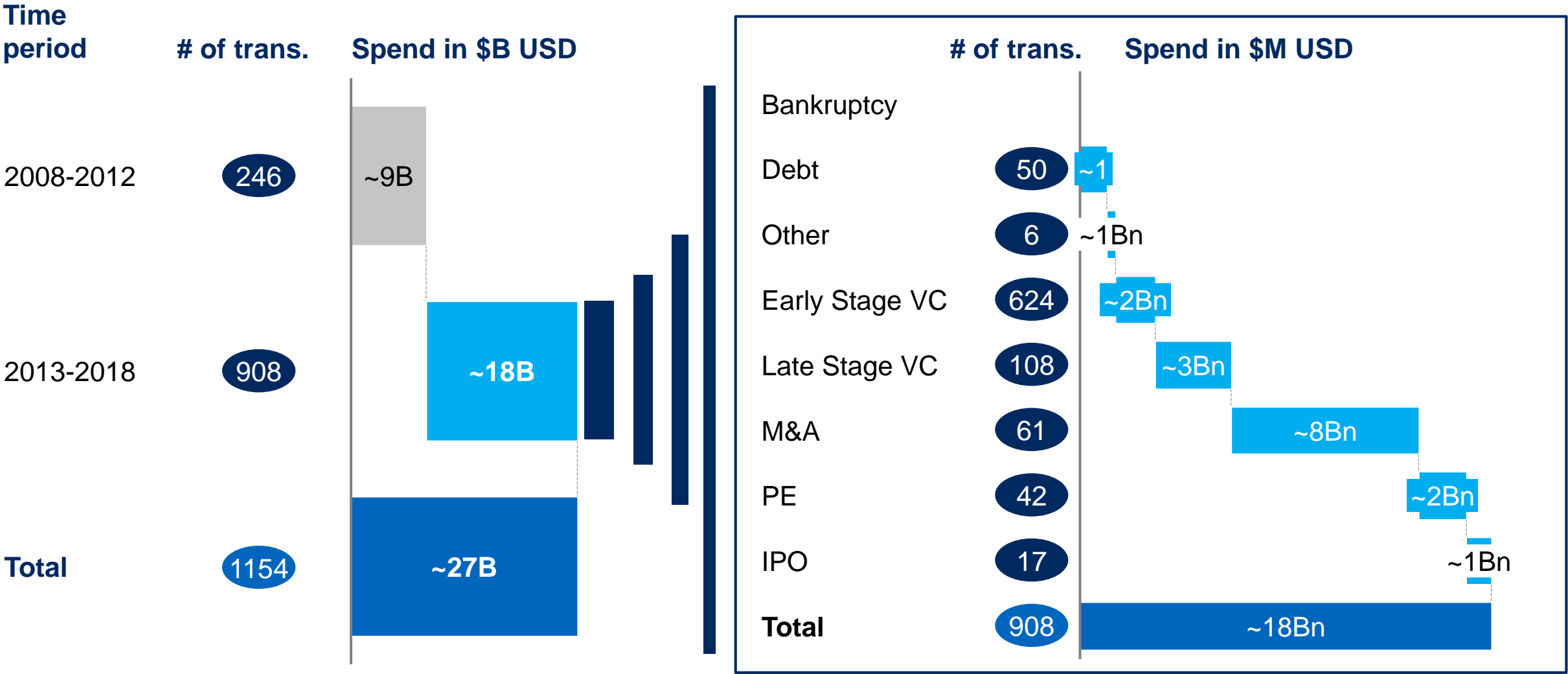
Geo center of gravity



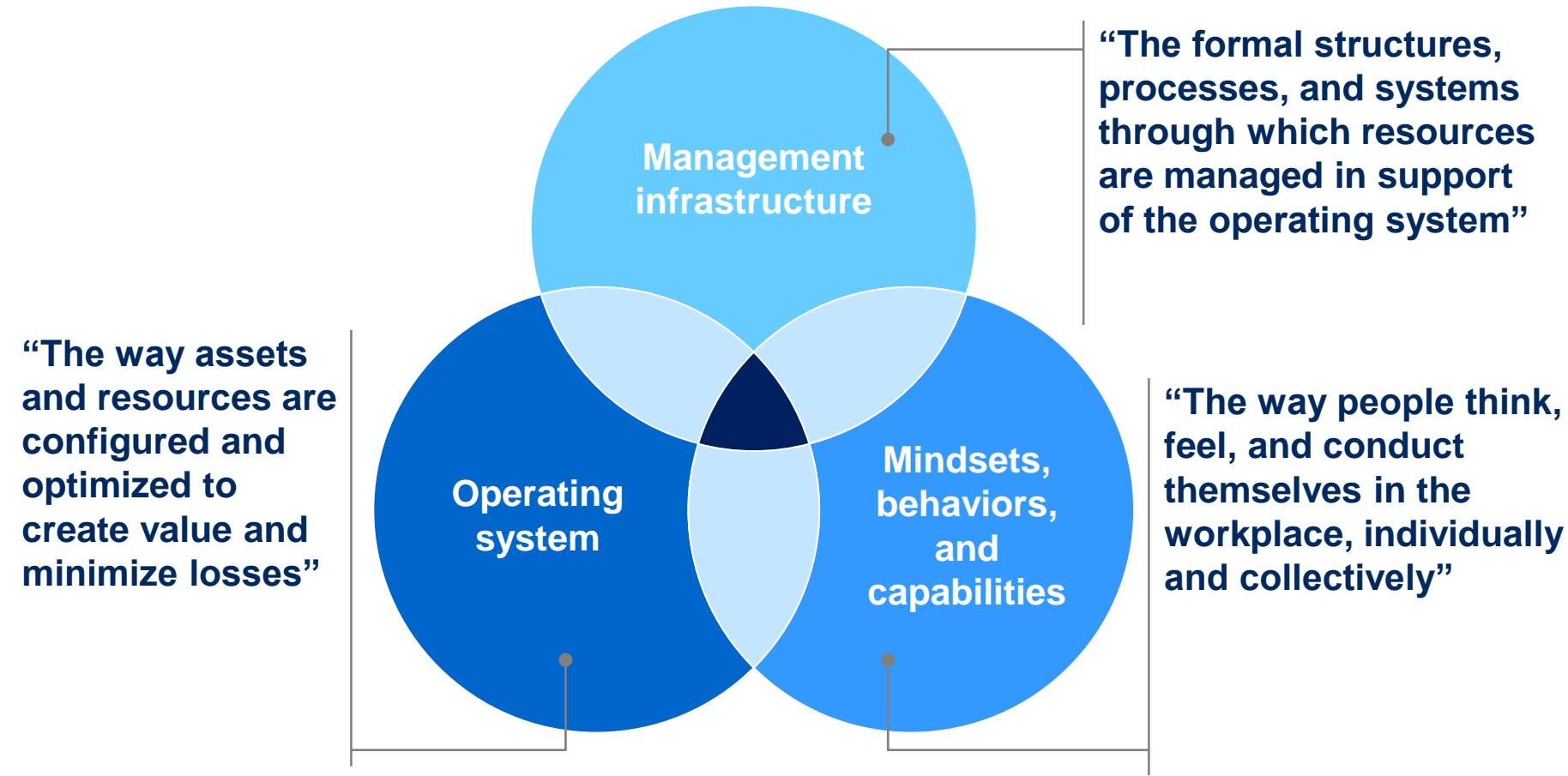
North America  
85%

# Investment in space has doubled over the past decade

Investment – over time and by type



Sustainable transformation requires commitment and change across all aspects of the organization

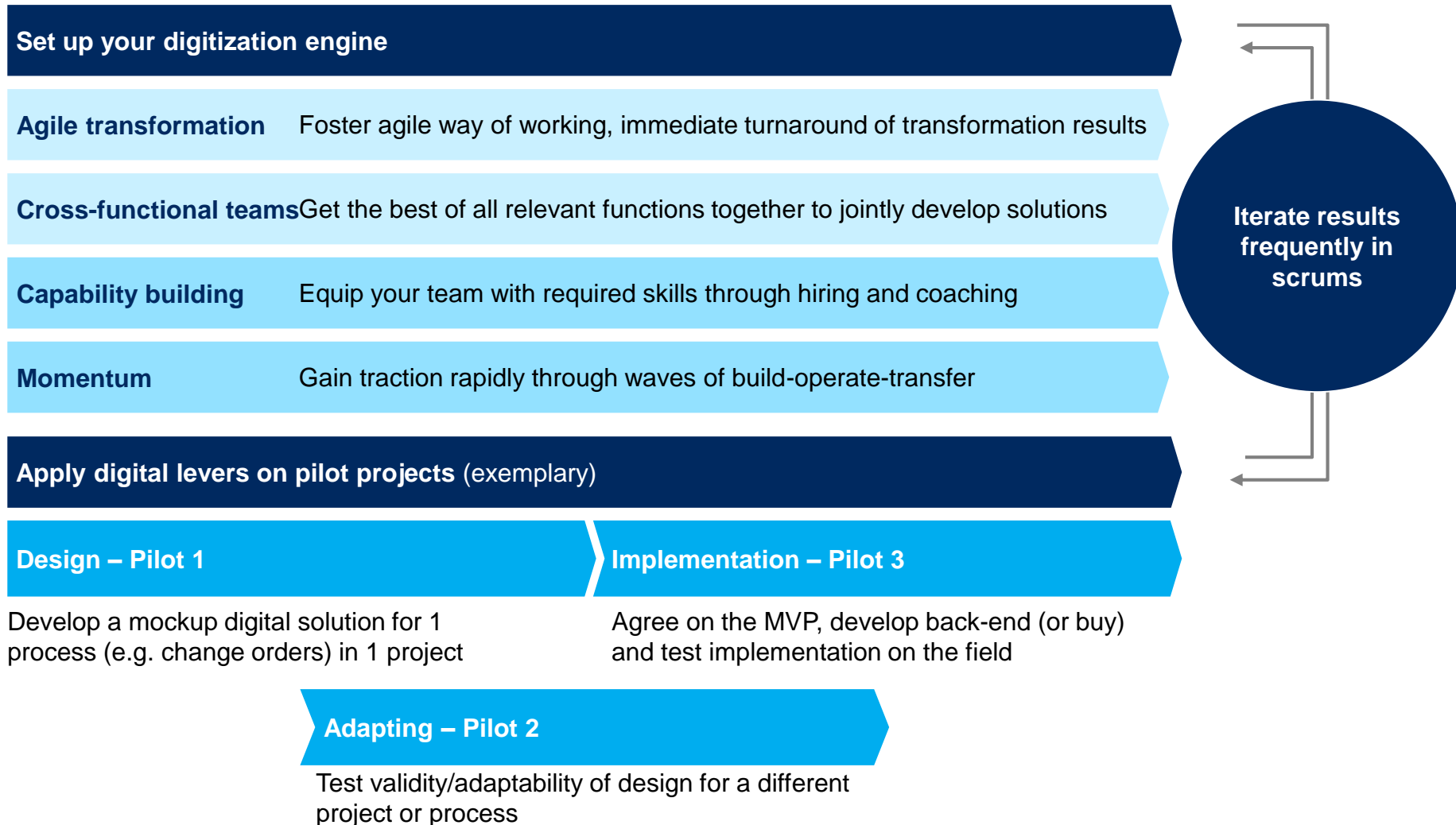




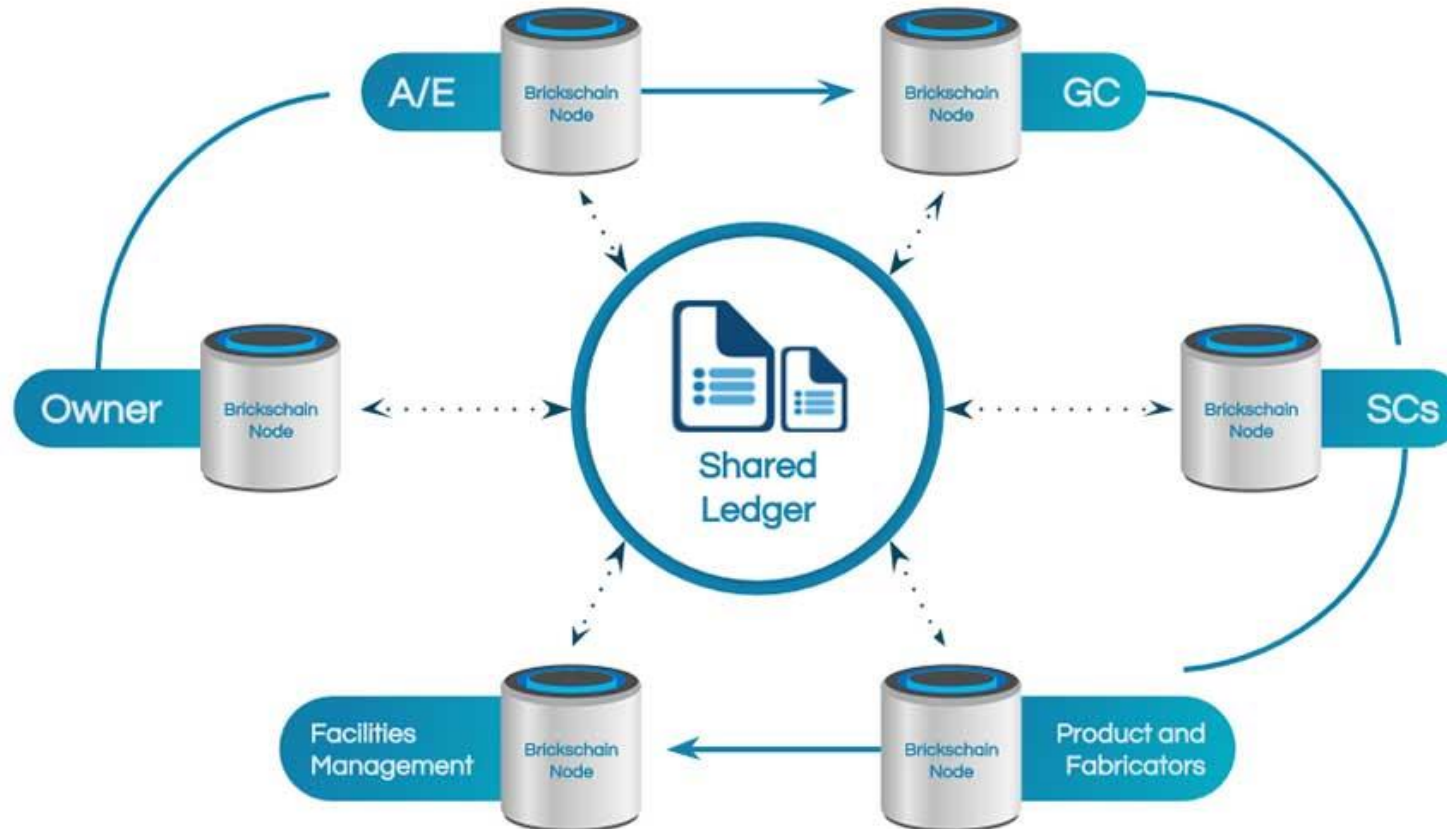
# There are a few enablers that will make digital successful in construction delivery

Strong data foundation	Integrated project management	Supportive contract strategies
<ul style="list-style-type: none"><li>▪ Implement one shared data backbone in one system</li><li>▪ Ensure at least 3D BIM from the start, otherwise amount of later rework will be prohibitive</li><li>▪ Make data available to all project participants, with upfront agreement from all</li></ul>	<ul style="list-style-type: none"><li>▪ Clarify roles of management of the project, as these will shift with a move to digital</li><li>▪ Specify owner of, and responsibilities for, the core data and system configuration</li></ul>	<ul style="list-style-type: none"><li>▪ Make digital participation part of the bidding contracts for all project participants</li><li>▪ Digital project emulates a collaborative contracting setup; leverage in contracts to prevent emergence of claim culture</li></ul>

# Digitizing engine and pilot run in parallel to iterate and improve results in an agile transformation approach



A small US based contractor found a possible use case for blockchain and just tried it on a small project



- Collecting project data took a week
- Brickschain nodes were installed on the project's Dropbox and Procore accounts
- The system automatically scraped IFC data about objects contained in the electronic files of the project's 2D plans
- It also captured all submittal transactions using software APIs.

## 10 'hard truths' from other sectors for construction

**01**

Digital transfers disproportionate economic value to customers

**02**

Barriers between industries are breaking down

**03**

Winner-takes-all dynamics will spread

**04**

Stop looking at competitors and focus instead at how supply and demand are changing

**05**

Fast-following is becoming too slow as agile learning widens the gap

**06**

Traditional trade-offs are **obsolete** as transaction costs are going to zero and transparency is increasing

**07**

Digital natives attack fast, but **incumbents** can respond at scale **to drive disruption even faster**

**08**

Strategy and execution (especially culture) need to be co-created

**09**

Incumbents can't choose between transforming the **core or innovating new business models – they need to both**

**10**

Digital transformations should also be about **operational excellence**, and require cultural and technical transformations at the same time







## Frank von Willert

*Senior Practice Manager*



McKinsey & Company



Berlin



00 49 30 8845 2280



Frank\_von\_willert@mckinsey.com

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