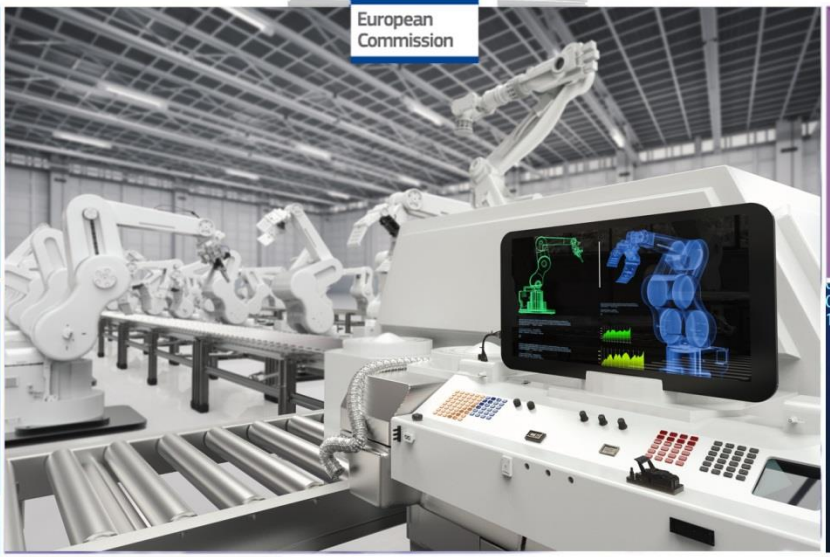


#DigitiseEU

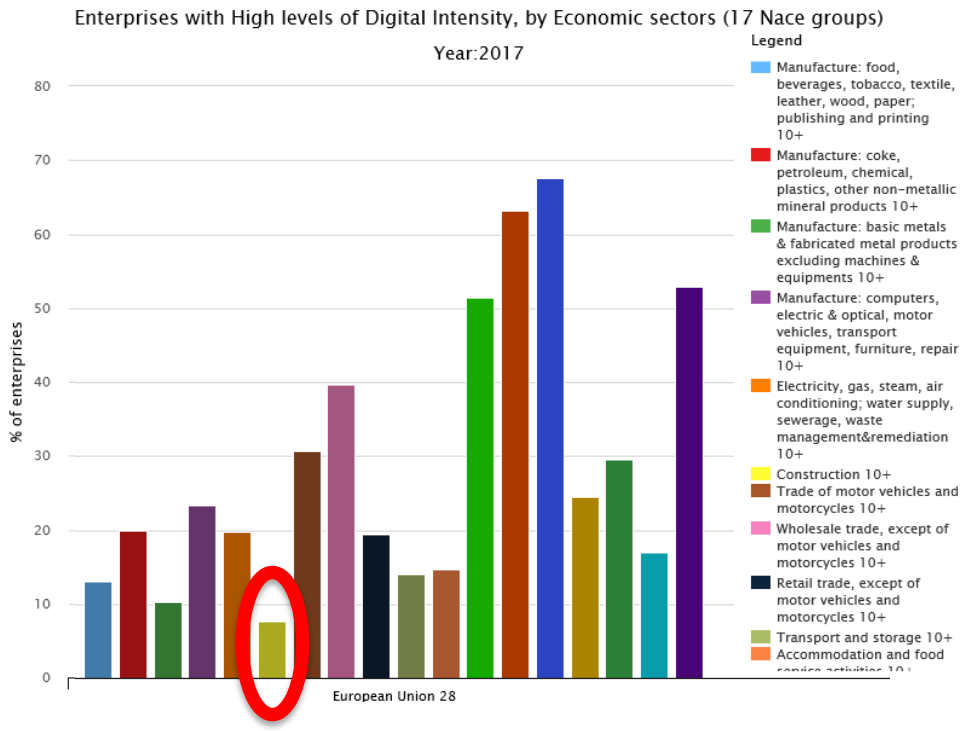
Digitising European Industry

Towards digital industrial platforms for the construction sector

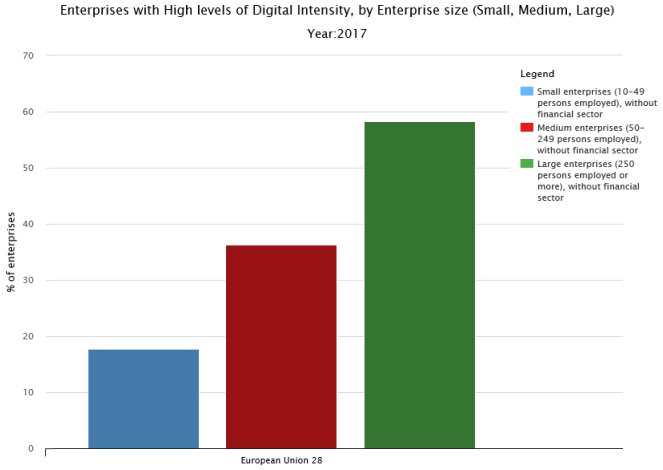
Dr. Arian Zwegers

Technologies & Systems for Digitising Industry, DG CONNECT, European Commission

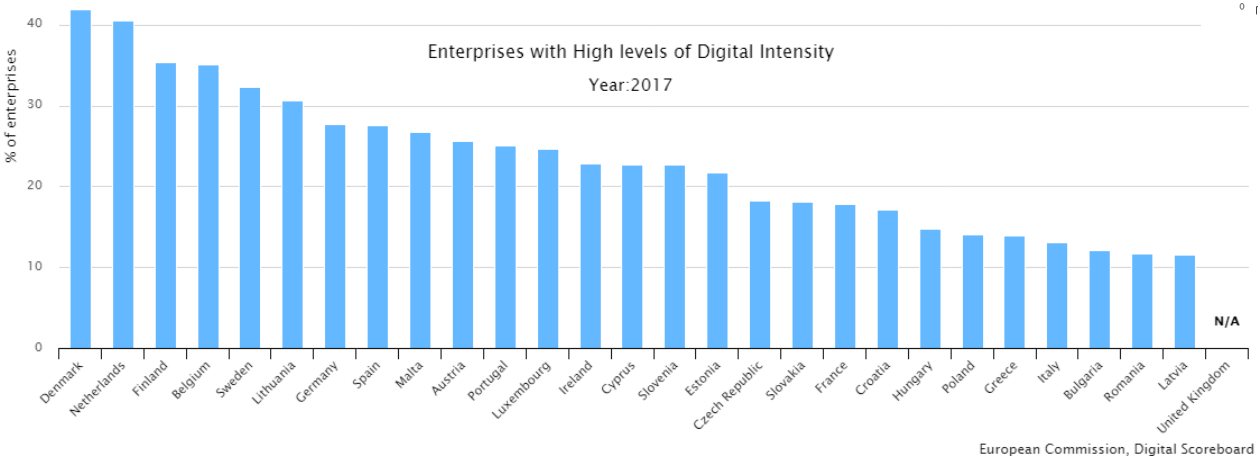
Level of digitalisation
vs size of company, sector, and country



68% of companies in computer programming, consultancy and information services are highly digitised.
Only around 8% of companies in construction are highly digitised.

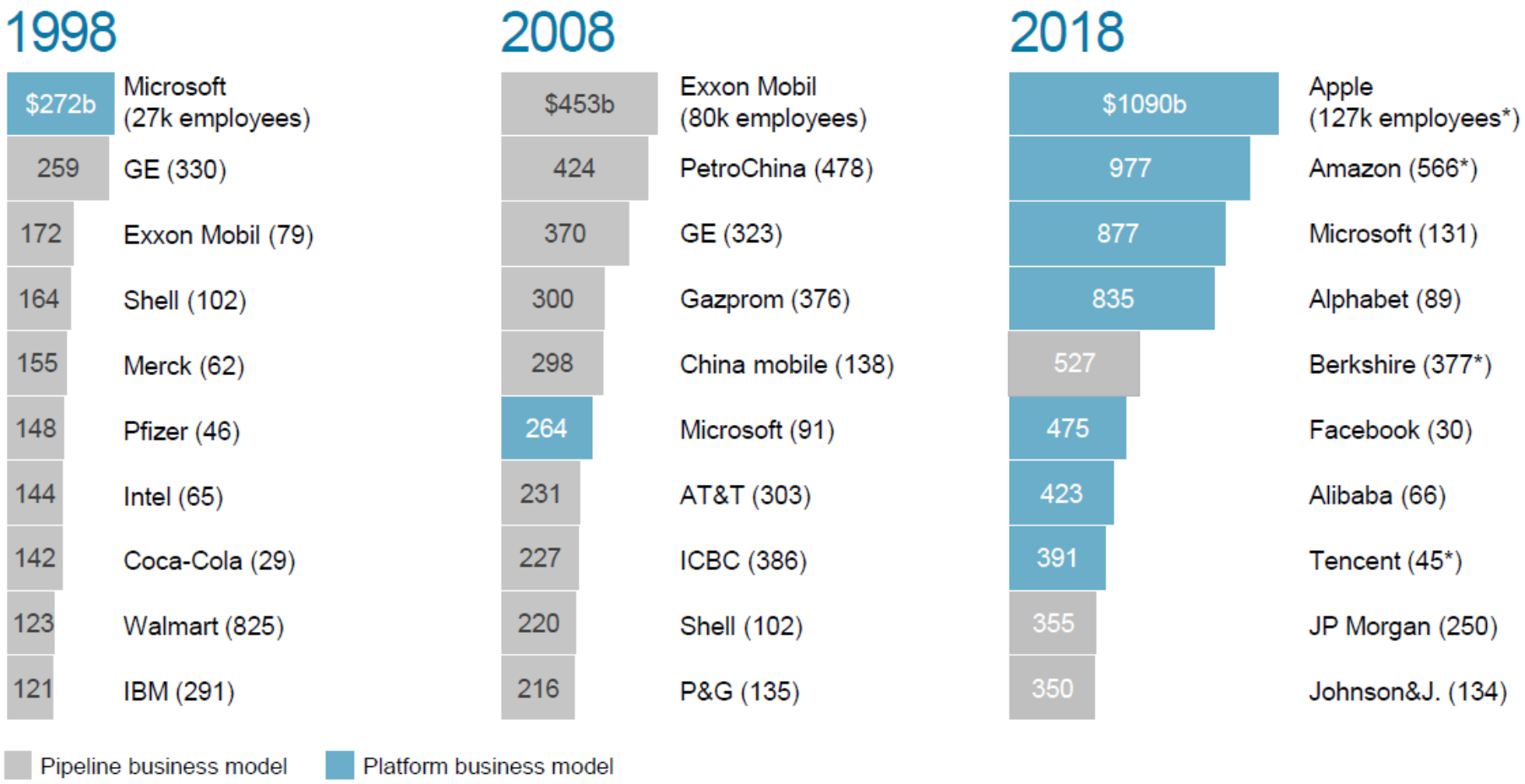


58% of large companies is highly digitised in EU vs 18% of SMEs



Only a fifth of companies in EU-28 are highly digitised, but 40% of companies in Denmark and the Netherlands and around 12% in Bulgaria, Romania and Latvia.

Largest companies
Typically technology providers

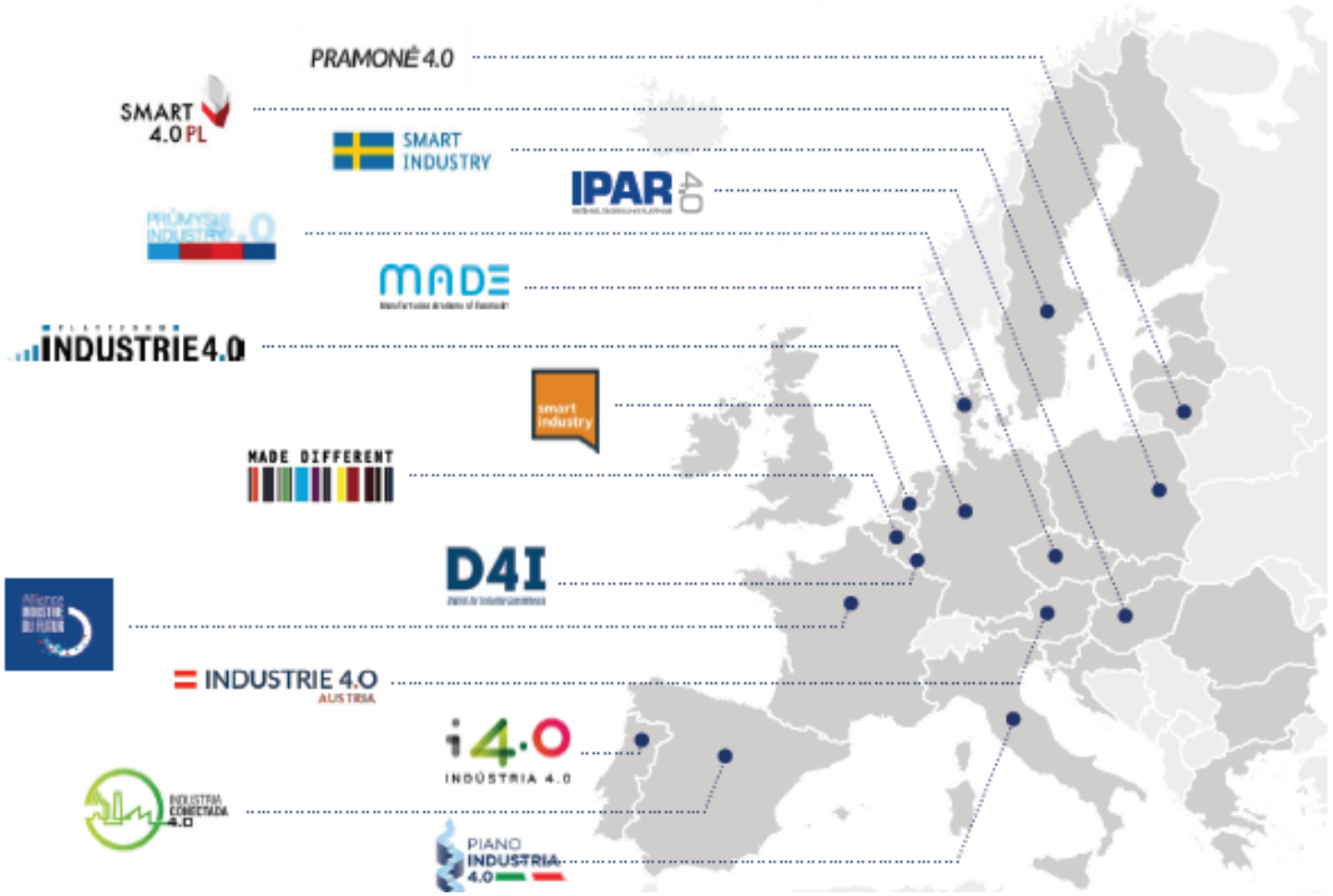


Prof. Svenja Falk, https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=54933

Digitising European Industry

Digitising European Industry Brochure
https://ec.europa.eu/digital-single-market/en/news/digitising-european-industry-2-years-brochure

Digitising European Industry
Existing national initiatives



Analysis of National Initiatives on Digitising Industry
https://ec.europa.eu/futurium/en/implementing-digitising-european-industry-actions/national-initiatives-digitising-industry

European Commission

Digital Innovation Hubs

Digital Innovation Hubs support companies – in particular SMEs – in their digital transformation

Test before invest

- Experimentation with software and hardware
- Demonstration facilities
- Piloting

Skills and training

- Train-the-trainer programmes
- Boot-camps
- Traineeships
- Exchange of training materials

Digital Innovation Hub

Support to find investments

- Feasibility studies
- Develop business plans
- Incubation and acceleration programmes

Innovation ecosystem & networking

- Marketplaces
- Collaborations
- Brokerages

Cloud-based CFD simulation for hypercars

- CFD aerodynamics simulation needed - but in house HPC resources not affordable
  Solution: Cloud-based pay-per-use HPC
- Results
  - 30% saving in design costs plus 50% reduction in wind tunnel and physical testing
  - Development savings of €90K per year
  - 30% decrease in time to market
- **250k€ Funding vs 4M€ benefit to company over 5 years using cloud-based pay-per-use HPC and simulation software**

Partners:
End-user SME: KOENIGSEGG – SE
ISV-SME: ICONCFD – UK
HPC centre: CINECA – IT
HPC centre: EPCC - UK

I4MS

Digital Innovation Hubs
Achievements since 2016

- **€500 million EU funding** for Digital Innovation Hubs (2016-2020)
- **A pan-European network of over 200 operational Digital Innovation Hubs**

I4MS SAE ACT PHAST ODINE Open Data Incubator Europe ECHORD++ ...

- **500 Startups, SMEs and mid-caps tested digital innovations** in collaboration with more than 150 Digital Innovation Hubs in 370 innovation experiments
- 13 EU countries included **Digital Innovation Hubs in national digitalisation strategies**

Mittelstand-Digital PIANO NAZIONALE INDUSTRIA 4.0 ...

- **Coaching more than 60 potential Digital Innovation Hubs** in regions with slower adoption of digital technologies, with focus on EU13.

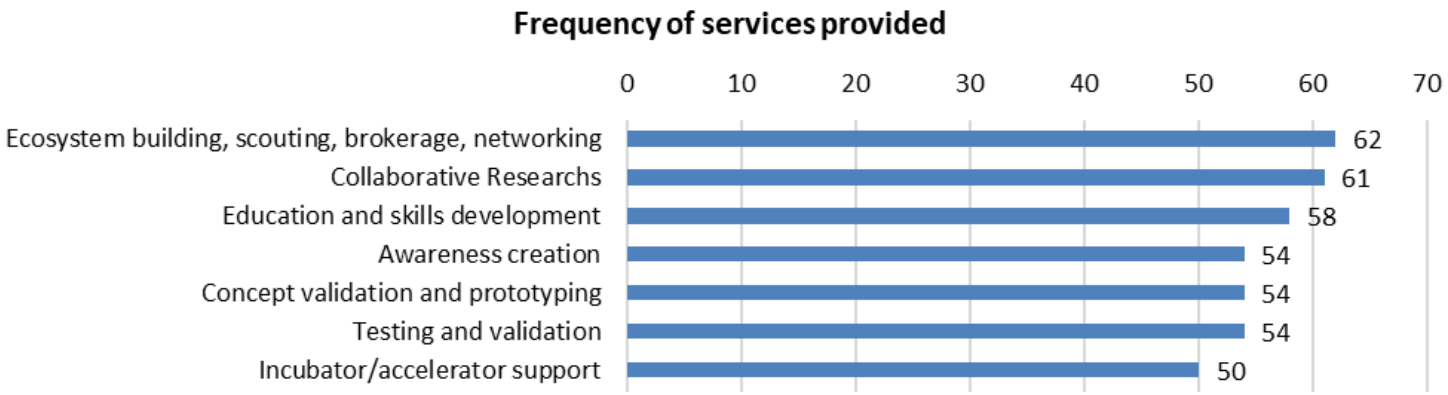
European Catalogue (yellow pages) of Digital Innovation Hubs: Operational Hubs April 2019

See http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-catalogue

Digital Innovation Hubs
DIHs in the construction sector

Technical competences

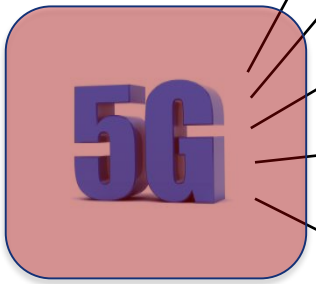
- Internet of Things
- Data mining, big data
- Artificial Intelligence
- Robotics and autonomous systems
- Simulation and modelling
- Augmented and virtual reality, visualization
- Cyber physical systems
- Interaction technologies
- Sensors, actuators, MEMS, NEMS, RF
- Cloud computing



Draft

Partnerships
Digital Value Chain

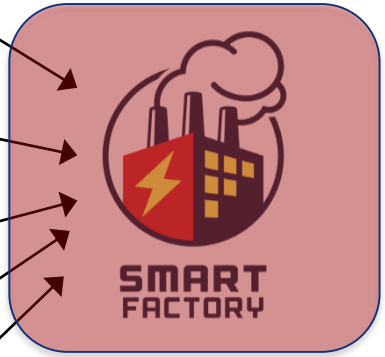

Micro-electronics




Robotics


Cloud computing

Autonomous driving

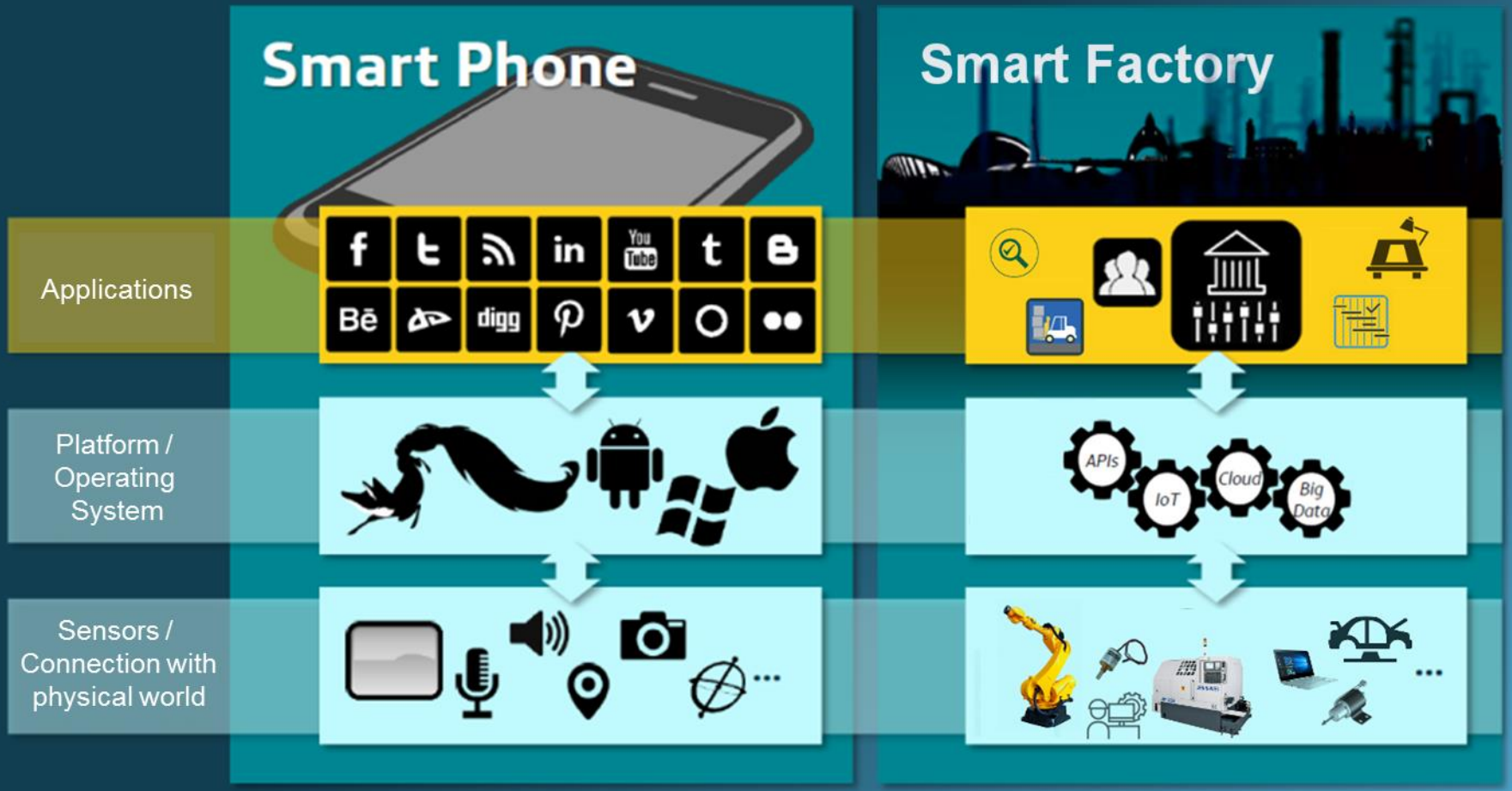



Healthy aging

European Commission

Digital Industrial Platforms
What do we mean?

An operating system that integrates different technologies and various applications and services



Digital Industrial Platforms
Roles

Roles of digital industrial platforms

Network/Marketplace/ Community

- Explicit connections between users
- Network is key value

Technology infrastructure

- Complementary applications
- Development platforms

Data

- Unlock data
- Integration

Examples of how different platforms fill in roles in different ways and to varying degrees

airbnb "Marketplace"

- Network/Marketplace/ Community
- Technology infrastructure
- Data

"Operating system"

- Network/Marketplace/ Community
- Technology infrastructure
- Data

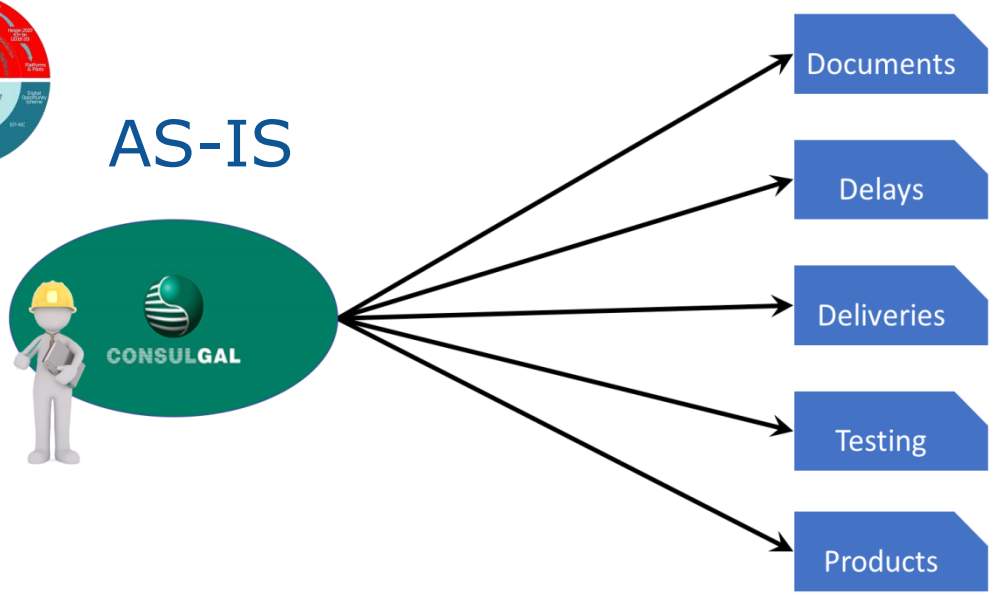
webMethods "Middleware"

- Network/Marketplace/ Community
- Technology infrastructure
- Data

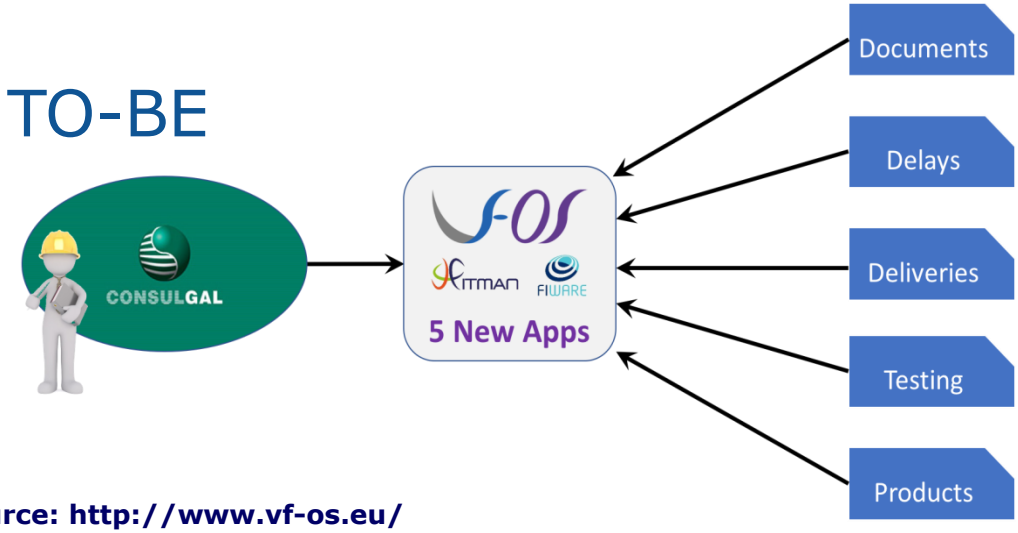
Adapted from http://platformed.info/platform-stack/

Example: vf-OS

AS-IS



TO-BE



Source: http://www.vf-os.eu/

FACTORIES DO MORE WITH vf-OS

CONSULGAL
CONSULTORES DE ENGENHARIA E GESTÃO, S.A.

Uses vf-OS for

Construction Industrialisation

Improving time and resource utilisation using vApps:

vf Document Portal	vf Steel Validation	vf Onsite Manager	vf Concrete Feedback	vf Product Validation
Sharing construction site documents	Identifiying and validating construction materials	Reporting delays and assisting in task	Providing feedback to concrete producers	Acquisition and managing reception

Results in:

- ☑ Reduction of time for accessing construction project data
- ☑ Reduction of time for setup a new construction supervision project
- ☑ Reduction of time spent on identifying steel ratio
- ☑ Reduction of concrete rejection using slump test result variability
- ☑ Reduction of rescheduling time when delays or failures occur
- ☑ Reduction of data exchange time between stakeholders

Contact: info@vf-os.eu
Web: http://www.vf-os.eu

/vfoseuropeanproject /vf-os-project

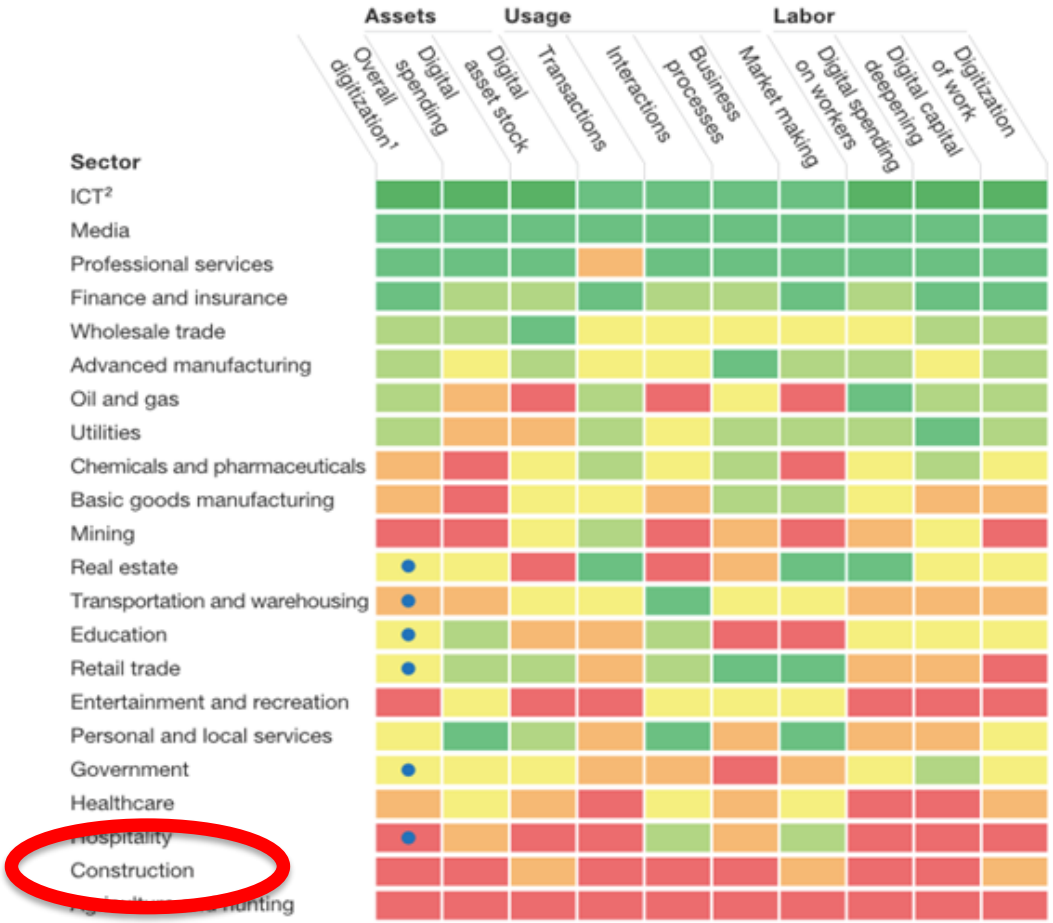
Funded by the Horizon 2020 Framework Programme of the European Union

Digital Industrial Platforms
Construction sector to WG/WP

McKinsey Global Institute industry digitization index; 2015 or latest available data

Relatively low digitization — Relatively high digitization

● Digital leaders within relatively undigitized sectors



- Working group input by Federcostruzioni, with support from ECTP and Fédération de l'Industrie Européenne de la Construction
- Efforts in Italy, France, Germany, the Netherlands, UK
- Joint effort at European level needed

See: https://ec.europa.eu/futurium/en/content/contribution-federcostruzioni-dei-wg2

https://www.mckinsey.com/industries/high-tech/our-insights/digital-america-a-tale-of-the-haves-and-have-mores

https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/reinventing-construction-through-a-productivity-revolution

Digital Industrial Platforms
McKinsey on Reinventing Construction (Feb 2017)

Construction matters for the world economy
... but has a long record of poor productivity

Construction-related spending accounts for **13%** of the world's GDP

...but the sector's annual productivity growth has only increased **1%** over the past 20 years

$1.6 trillion of additional value added could be created through higher productivity, meeting half the world's infrastructure need

Action in seven areas can boost sector productivity by 50–60%

- Reshape regulation
- Rewire contracts
- Rethink design
- Improve procurement and supply chain
- Improve onsite execution
- Infuse technology and innovation
- Reskill workers

5–10x productivity boost

possible for some parts of the industry by moving to a manufacturing-style production system

See: https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/reinventing-construction-through-a-productivity-revolution

Digital Industrial Platforms
Digitalising the Construction Sector (March 2019)

- Digital industrial platforms in context of data sharing
- Code of Conducts
- Incentives for industry to share data?

See: https://issuu.com/cece_europe/docs/final_nobianche2-ied_consulting_-_f

Digital Industrial Platforms
Call for Submission of Construction Digital Platforms in Singapore

KEY DELIVERABLES, ASPECTS & OUTCOMES OF CONSTRUCTION DIGITAL PLATFORMS

Some commercial solutions:

aconex

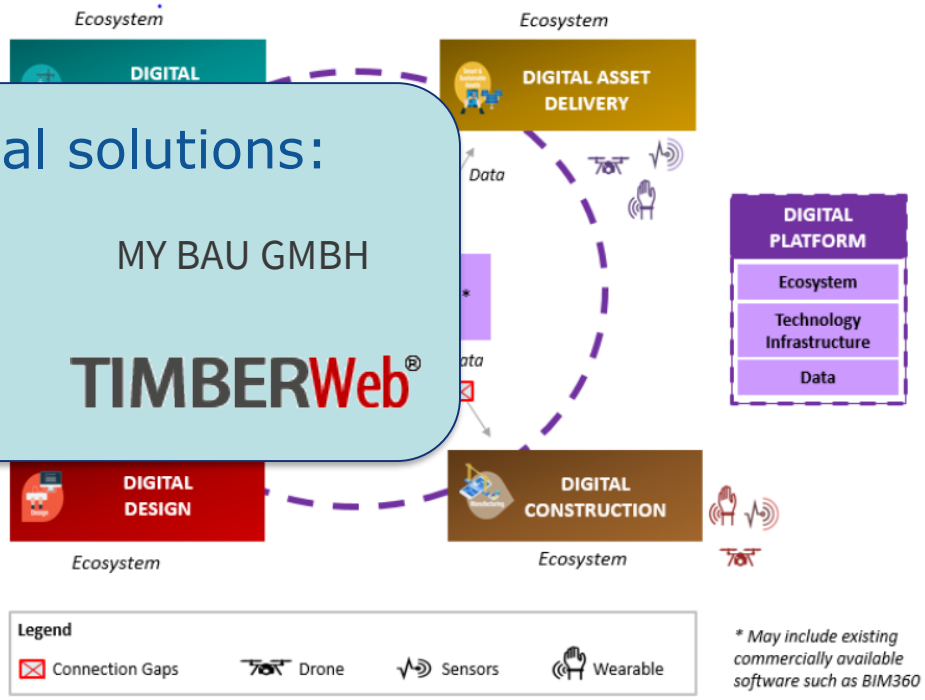
MY BAU GMBH

thinkproject!

TIMBERWeb®

Delivera

a) Better gathering & use of da
at least one aspect of the ID
b) Enable interoperability of da
data formats commonly adop
industry
c) Enable firms to collaborate & allow innovative solutions and other third party solution providers to plug in through open APIs



Partnership Model

IT vendors including: Digital platform providers, Technology and/or solution providers, System integrators	Service buyers in the Construction Value Chain like developers, contractors, engineers, manufacturers and FM

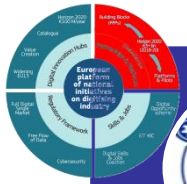
3 Fundamental Aspects of Digital Platforms

1. Integration of Ecosystem
2. Technology Infrastructure including software
3. Use of Data

See: https://www.imda.gov.sg/-/media/imda/files/industry-development/infrastructure/digital-platforms/fact-sheet-on-construction-digital-platform.pdf?la=en

European Commission

WP 2018-2020
Platforms and Piloting topics



DT-ICT-07-2018-2019: Digital Manufacturing Platforms

- 2018: Agile Value Networks: Lot-size One
- 2018: Zero-defect Processes and Products
- 2019: Machines & Human Competences
- 2019: Sustainable Value Networks

2018: 48 M€
2019: 47 M€

DT-ICT-08-2019: Agricultural Digital Integration Platforms
30 M€

DT-ICT-09-2020: Digital Service Platforms for Rural Economies
30 M€

DT-ICT-12-2020: Smart Hospital of the Future
40 M€

DT-TDS-01-2019: Smart and Healthy Living at Home
60 M€

DT-ICT-10-2018-2019: Interoperable and Smart Homes and Grids
30 M€

DT-ICT-11-2019: Big Data Solutions for Energy
30 M€

Cross-cutting issues, IoT, Big Data, Security…

DT-ICT-13-2019: Digital Platforms/Pilots Horizontal Activities, 4 M€
Including Preparation of a digital industrial platform for the construction sector, 1 M€

DigiPLACE – Digital Platform for Construction in Europe

- Proposed start: 1 Sept 2019, duration 18 months
- Budget: 1.0 M€

- Aims to create a Reference Architecture Framework (RAF) for *the* digital industrial platform for the construction sector
- Need for large consensus at European level that takes account of needs and constraints of all stakeholders in construction value chain
- Community of Stakeholders: open to all interested parties to join, mobilized through questionnaires, may participate to workshops
- Major outcomes are RAF and Strategy Roadmap for progressive implementation of the RAF in digital platforms

European Commission

Thank you!

Contacts

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bit.ly/2yafter

Follow the latest progress and get involved

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@DSMeu

bit.ly/DigitiseEUpillars
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