Digital Transformation Scoreboard 2018

EU businesses go digital: Opportunities, outcomes and uptake
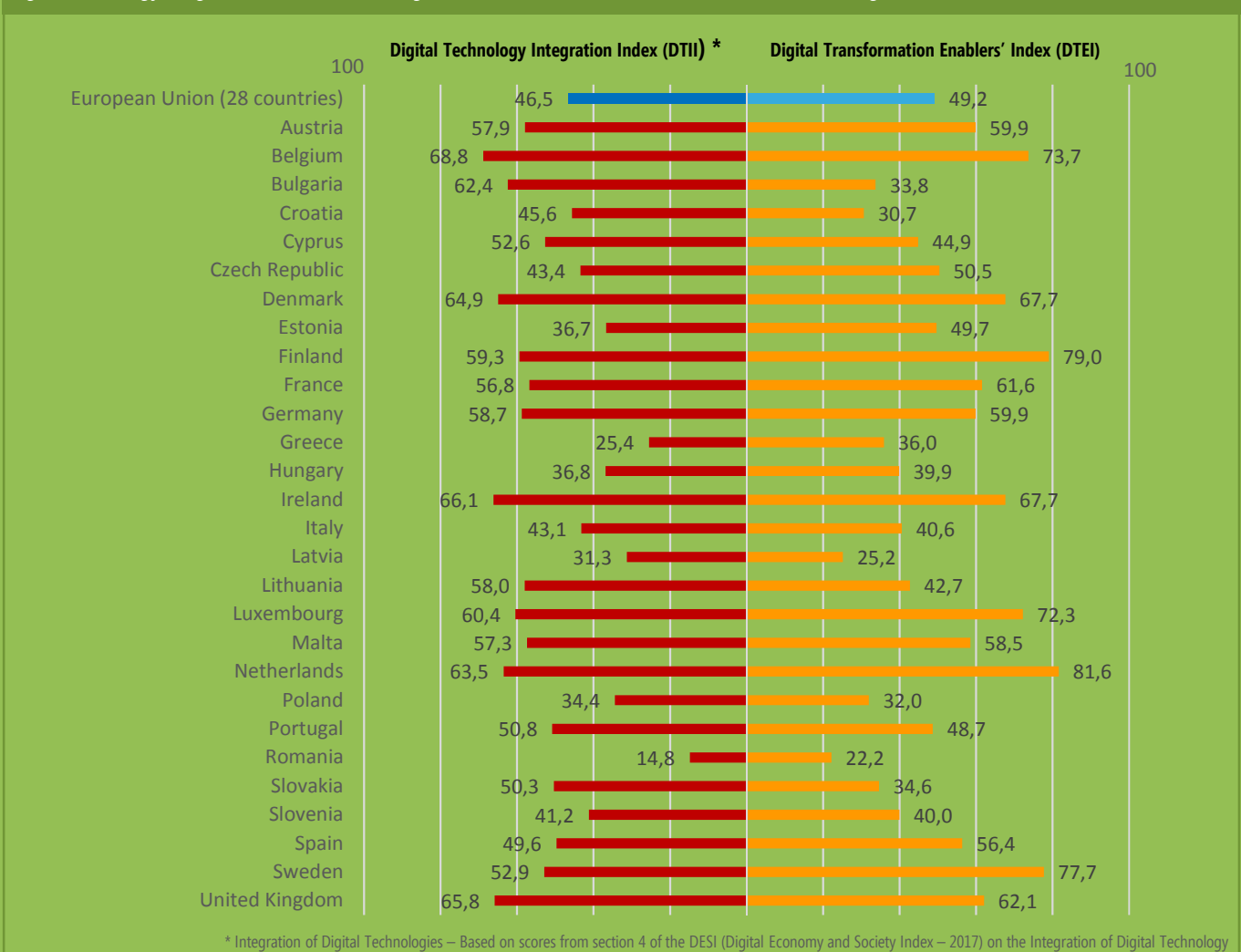
February 2018

Executive summary

Conditions and outcomes of digital transformation

- With respect to the **national indicators analysis** carried out in the previous Digital Transformation Scoreboard, more Member States perform considerably above the EU-28 average in terms of digital technology integration. Nevertheless, improvements are necessary for eastern and southern Member States, which still lag behind.

- In comparison to 2016, Scandinavian and western European economies still dominate the top positions (DTEI/DTII). Nevertheless, it is encouraging to observe the progress of countries in lower positions.

- The Netherlands, Finland, Sweden, Belgium, and Luxembourg are leading the way in terms of conditions enabling digital transformation (DTEI).

- Significant progress has been made across the EU in entrepreneurial culture, supply and demand of skills and investments and access to finance.

- The comparison between the Digital Technology Integration Index (DTII) scores across Member States shows that the three highest-scoring economies are Denmark, Ireland, and Finland.

Digital Technology Integration Index (DTII) and Digital Transformation Enablers' Index (DTEI) (EU-28 average)

	Digital Technology Integration Index (DTII) *	Digital Transformation Enablers' Index (DTEI)
European Union (28 countries)	46,5	49,2
Austria	57,9	59,9
Belgium	68,8	73,7
Bulgaria	62,4	33,8
Croatia	45,6	30,7
Cyprus	52,6	44,9
Czech Republic	43,4	50,5
Denmark	64,9	67,7
Estonia	36,7	49,7
Finland	59,3	79,0
France	56,8	61,6
Germany	58,7	59,9
Greece	25,4	36,0
Hungary	36,8	39,9
Ireland	66,1	67,7
Italy	43,1	40,6
Latvia	31,3	25,2
Lithuania	58,0	42,7
Luxembourg	60,4	72,3
Malta	57,3	58,5
Netherlands	63,5	81,6
Poland	34,4	32,0
Portugal	50,8	48,7
Romania	14,8	22,2
Slovakia	50,3	34,6
Slovenia	41,2	40,0
Spain	49,6	56,4
Sweden	52,9	77,7
United Kingdom	65,8	62,1

* Integration of Digital Technologies – Based on scores from section 4 of the DESI (Digital Economy and Society Index – 2017) on the Integration of Digital Technology

Digital transformation in selected industries

- The **2018 survey** shows that the pace of digital adoption differs significantly across the two industries studied. Both the food and the construction industries have different needs, and digital adoption depends greatly on these needs.

- 57% of the companies surveyed believe that they have the necessary skills to adopt new digital technologies.

- 27% of European businesses in the food industry and 10.7% of those in construction have appointed a Chief Digital Officer.

- More than 70% of the companies surveyed indicate to have invested in digital technologies to improve production processes.

Digital pulse – Using media analytics to assess the uptake of Industry 4.0 technologies

These results are based on a **Digital Intelligence Platform** which measures the 'digital pulse' of the interest and acceptance levels of the technologies in EU Member states. Quantitative analysis enabled the frequency of mentions and the net sentiment for each of the six technologies to be analysed over the course of 2017, and the results were aggregated by week.

- Cybersecurity, Blockchain technology and artificial intelligence are the three most popular technologies and technological solutions on online media channels in 2017.

- In 2017, the most digitally aware European countries were the UK, Spain, Denmark, and Luxembourg.

### Popularity of digital technologies in online media

- Cybersecurity
- Blockchain
- Artificial Intelligence
- Autonomous Driving
- Robotics
- 5G
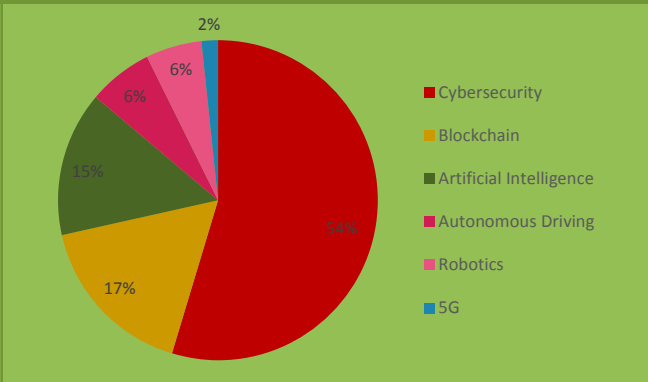
Example: The digital pulse for artificial intelligence

Volume of discussions about AI in 2017 (EU-28):
- The trend in the volume of discussions about AI marginally increased during the period.
- This trend shows three distinguishable peaks that are likely to correspond to the excitement around NASA´s Kepler space telescope, which analysed thousands of exoplanets using machine-learning technologies, and ultimately helped to discover a new exoplanet in December 2017.

Development of AI sentiment in 2017 (EU-28):
- The general perception of artificial intelligence is positive and optimistic, with significant positive growth since September '17.
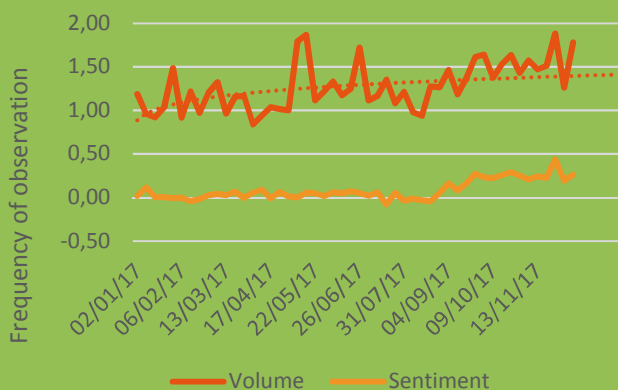
Digital transformation policies

In the policy landscape of European countries, digital transformation policies take different shapes. Next to initiatives directly targeting the digitisation of industry, EU Member States have also set up other types of initiatives, such as strategies for the development of information society and innovation programmes, that are closely intertwined with their national digital growth strategy. The development of national initiatives for digitising industry is an important element of the European Platform of National Initiatives on Digitising Industry which is at the core of the Digitising European Industry strategy, and a forum to identify challenges that need to be addressed at EU level, share experiences and best practices, trigger collaboration, boost co-investments and explore common approaches to regulation, skills and jobs. The platform comprises fifteen national initiatives for digitising industry, with further initiatives under preparation.

On the basis of **desk research and interviews**, the DTM analysed a total of 19 national digital transformation policies and programmes. The main results of the analysis include:

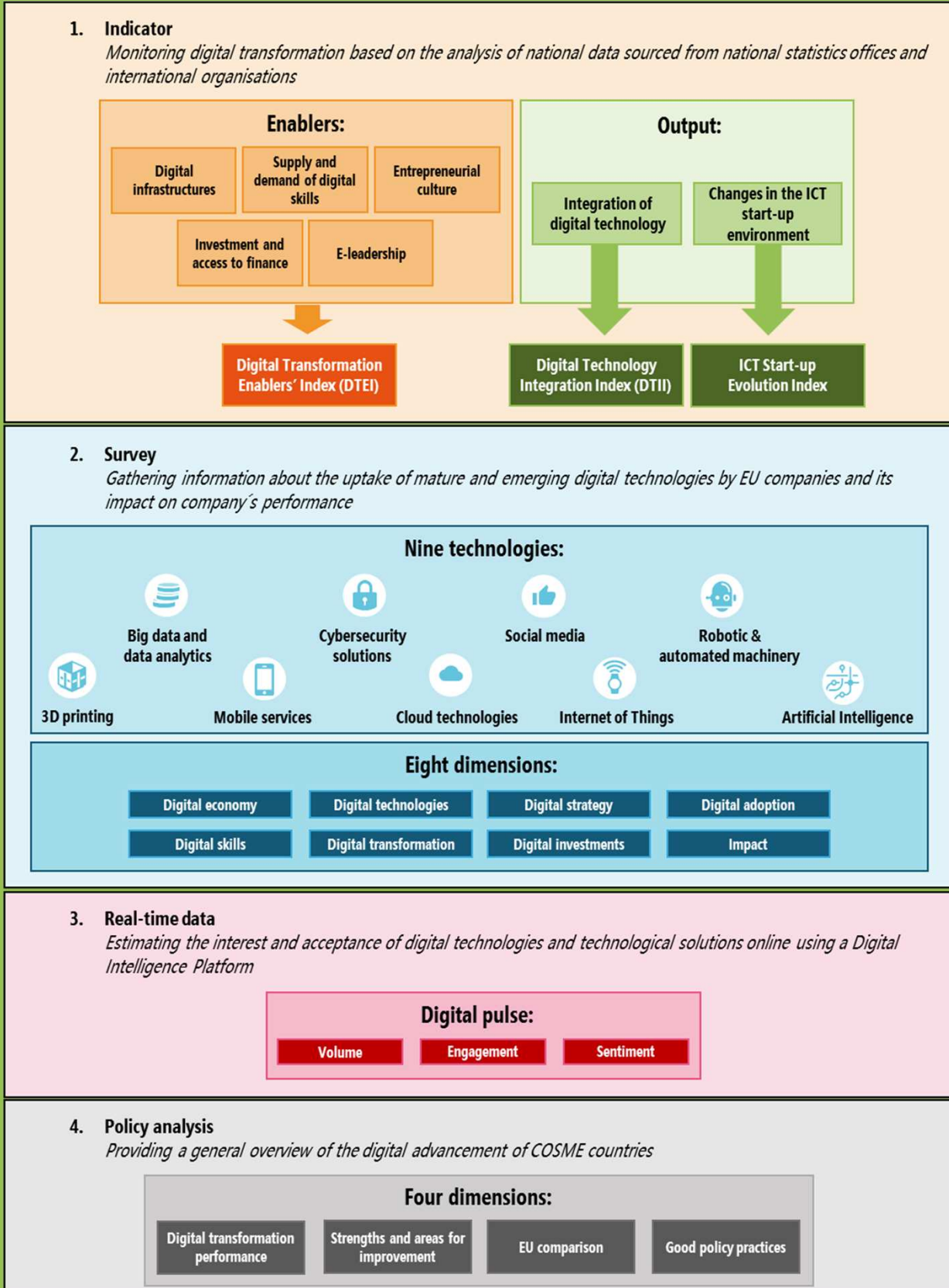- These policies have common goals but differ in many aspects e.g. policy design, funding approach, financial size and implementation strategies.

- **Stakeholders from industry and research** played an important role.

- These policies focus equally on the development of new technologies and on the deployment and use in industry of existing technologies.

National digital transformation policies and programmes

Framework of the Digital Transformation Scoreboard

The Digital Transformation Scoreboard (DTS) is part of the Digital Transformation Monitor (DTM) which aims to contribute to the knowledge base on the state of play and evolution of digital transformation in Europe. The DTM offers an insight into statistics and initiatives to support digital transformation, as well as reports on key industrial and technological opportunities, challenges and policy initiatives related to digital transformation.

1. Indicator
Monitoring digital transformation based on the analysis of national data sourced from national statistics offices and international organisations

Enablers:

- Digital infrastructures
- Supply and demand of digital skills
- Entrepreneurial culture
- Investment and access to finance
- E-leadership

→ **Digital Transformation Enablers' Index (DTEI)**

Output:

- Integration of digital technology
- Changes in the ICT start-up environment

→ **Digital Technology Integration Index (DTII)**

→ **ICT Start-up Evolution Index**

2. Survey
Gathering information about the uptake of mature and emerging digital technologies by EU companies and its impact on company´s performance

Nine technologies:

- Big data and data analytics
- Cybersecurity solutions
- Social media
- Robotic & automated machinery
- 3D printing
- Mobile services
- Cloud technologies
- Internet of Things
- Artificial Intelligence

Eight dimensions:

- Digital economy
- Digital technologies
- Digital strategy
- Digital adoption
- Digital skills
- Digital transformation
- Digital investments
- Impact

3. Real-time data
Estimating the interest and acceptance of digital technologies and technological solutions online using a Digital Intelligence Platform

Digital pulse:

- Volume
- Engagement
- Sentiment

4. Policy analysis
Providing a general overview of the digital advancement of COSME countries

Four dimensions:

- Digital transformation performance
- Strengths and areas for improvement
- EU comparison
- Good policy practices

Overview DTM reports

Sector

Automotive

- Adoption of novel technologies across the automotive value chain
- The race for automotive data: Digital platforms versus automotive manufacturers
- Autonomous cars: The future of the automotive industry

Food processing

- Smart vineyard: management and decision making support for wine producers
- Connected livestock
- Drones in agriculture

Aerospace & aeronautic

- Industry 4.0 in Aeronautics: 3D/Design – applications
- Inflight entertainment and communication: Technologies and market
- Big Data in Earth Observation
- Low-Earth Orbit satellites: Spectrum access

Mechanical engineering

- Digitising mechanical engineering: Leveraging the potential of the cloud and data

Housing

- Smart Building: Energy efficiency application
- Secure access control Smart ID Management for building access
- Energy harvesting to power the rise of the Internet of Things
- Smart Home: Technologies with a standard battle

Healthcare and pharmaceutical

- Uptake of digital solutions in the healthcare industry

Technology

- The disruptive nature of 3D printing
- Autonomous cars: A big opportunity for European industry
- Mobile and mobility: New opportunities to improve customer engagement.
- Industry 4.0 in agriculture: Focus on IoT aspects

- The Internet of Things: Reshaping the sport industry
- Interactive Policy Seminar on AI
- Harnessing the economic benefits of AI
- USA-China-EU plans for AI: where do we stand?
- Industry 4.0 in Aeronautics: IoT applications

- The rise of Virtual personal assistant
- Biometric technologies
- Blockchain
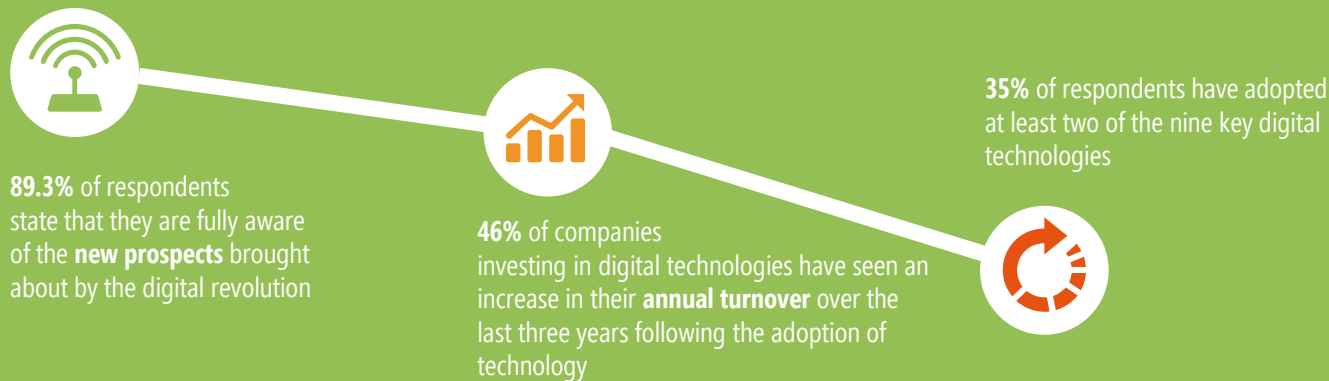- Augmented and virtual reality

Challenges

- Bring your own device (BYOD): A major security concern
- Big data: A complex and evolving regulatory framework
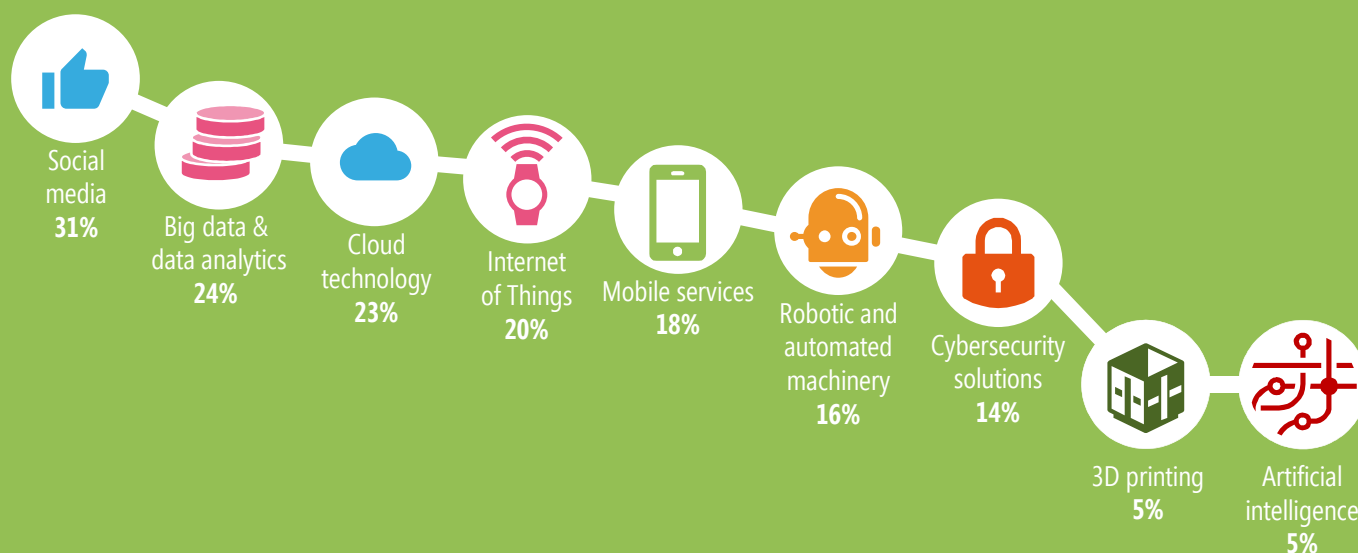
Policy – Cities & regions

- Trento: Building on past achievements
- Tallinn: A city of the future
- Cote d´Azur: Anchoring its leading position
- Lisbon´s engines for growth
- Hamburg: Capitalising on its entrepreneurs

- Espoo as a digital launch pad
- Bristol: the world´s first open city
- Rejuvenating Barcelona with digital technologies
- New York City: The world's fastest growing startup technology center

- Turning Luxembourg into a digital nation
- Lund: The city of ideas
- Łódzkie: A region specialised in ICT
- Amsterdam´s collaborative economy

Key results from the DTM survey 2018

A recognised yet untapped opportunity in the food and construction industries

89.3% of respondents state that they are fully aware of the **new prospects** brought about by the digital revolution

46% of companies investing in digital technologies have seen an increase in their **annual turnover** over the last three years following the adoption of technology

35% of respondents have adopted at least two of the nine key digital technologies

Low adoption rate of the nine key technologies in the two surveyed industries

Social media **31%**

Big data & data analytics **24%**

Cloud technology **23%**

Internet of Things **20%**

Mobile services **18%**

Robotic and automated machinery **16%**

Cybersecurity solutions **14%**

3D printing **5%**

Artificial intelligence **5%**

Industry characteristics

- **32.6%** of respondents in the construction industry think that the availability of novel technologies poses an **operational risk** for their company
- **85,7%** of respondents in the construction sector have integrated digital technologies into their **innovation strategy**

- **48%** of respondents in the food sector that have adopted digital technologies have experienced up to 20% increases in **productivity gains** over the last three years
- **27%** of respondents in the food sector have appointed a **Chief Digital Officer**

Source: Digital Transformation Scoreboard survey 2018 (n=120)