



Digital Innovation
SEIZING POLICY OPPORTUNITIES



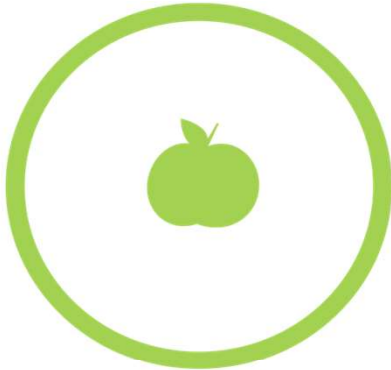
DIGITAL INNOVATION: SEIZING POLICY OPPORTUNITIES

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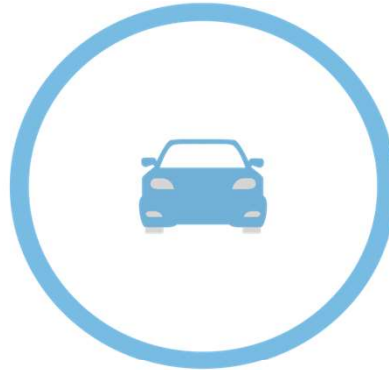


Digital technologies are transforming all sectors of the economy



AGRO-FOOD

- **Precision farming** (i.e. use of digital technologies to optimize use of inputs for crops to grow optimally)
- **Big data analytics & AI** to inform farm management decision making
- Potential to **trace products** along supply chains (using IoT & blockchain)



AUTOMOTIVE

- **Autonomous** / self-driving cars
- **Car sharing services** & other alternatives to car ownership
- **Smart factories** (use of IoT & robotics in production processes)

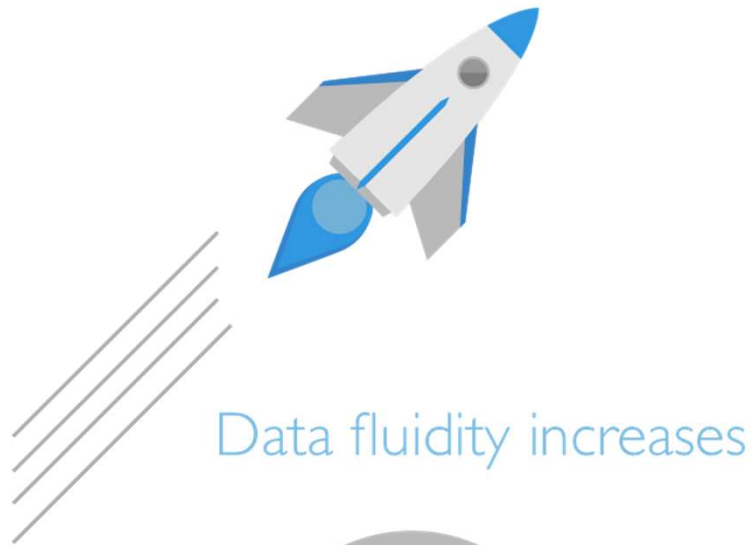


RETAIL

- **Big data analytics** for customized advertisement
- **Enhanced shopping experiences** (e.g. 3D visualizations)
- **IoT & robotics** for better inventory management



Digital technologies are changing the nature & characteristics of innovation



Data fluidity increases



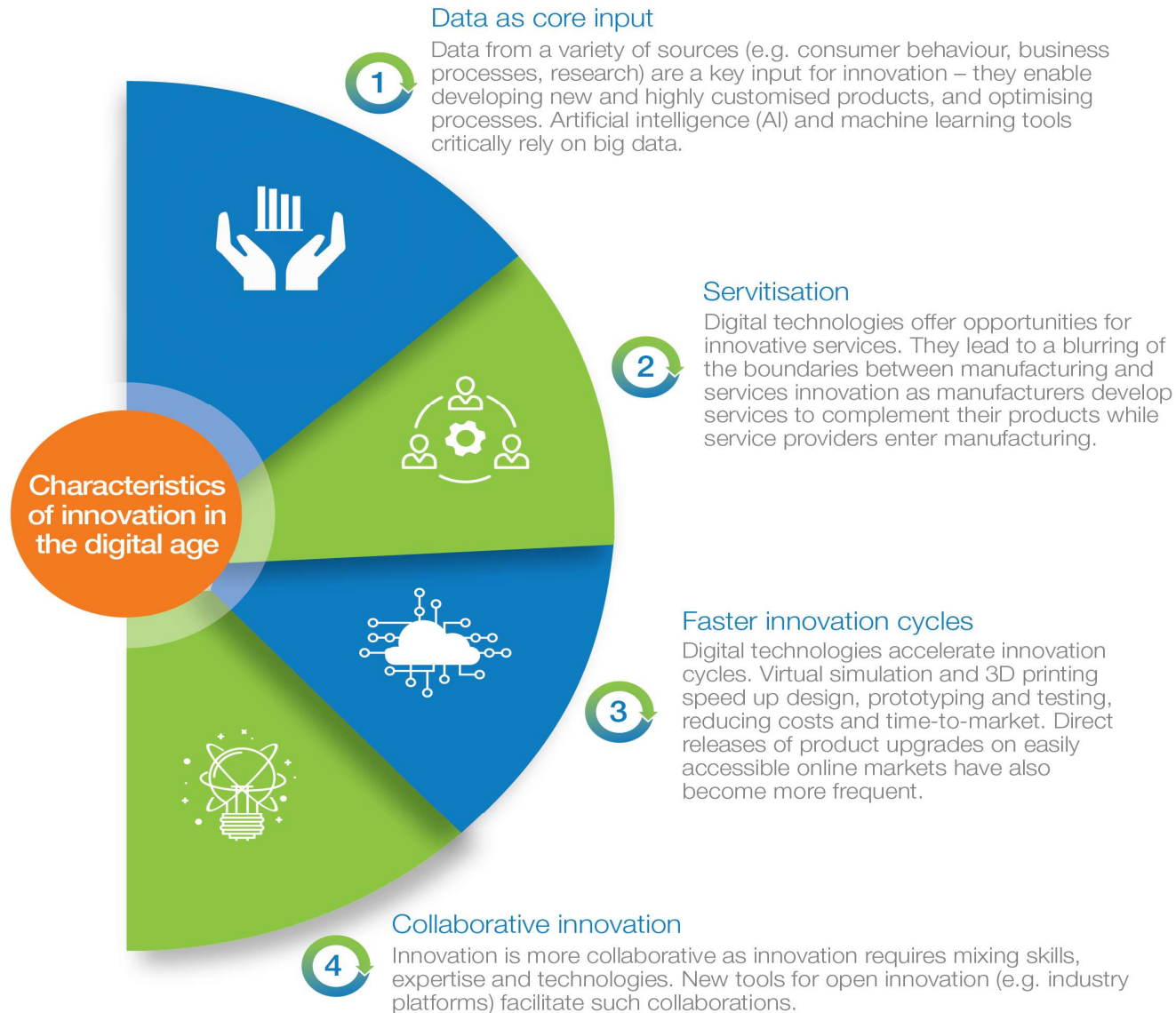
Costs decrease

Data can be **shared and manipulated instantaneously** on a huge scale and little cost, among any number of actors regardless of their location.





Four trends characterise innovation in the digital age





(1) Data as a core input for innovation



Changing research processes, e.g.:

- Large scale computerised experiments

New services & business models, e.g.:

- smart farming
- on-demand mobility services

Enhanced customisation, e.g.:

- personalise retail & advertisement
- precision medicine

Processes optimisation, e.g.:

- predictive maintenance
- stock management systems
- supply chain management





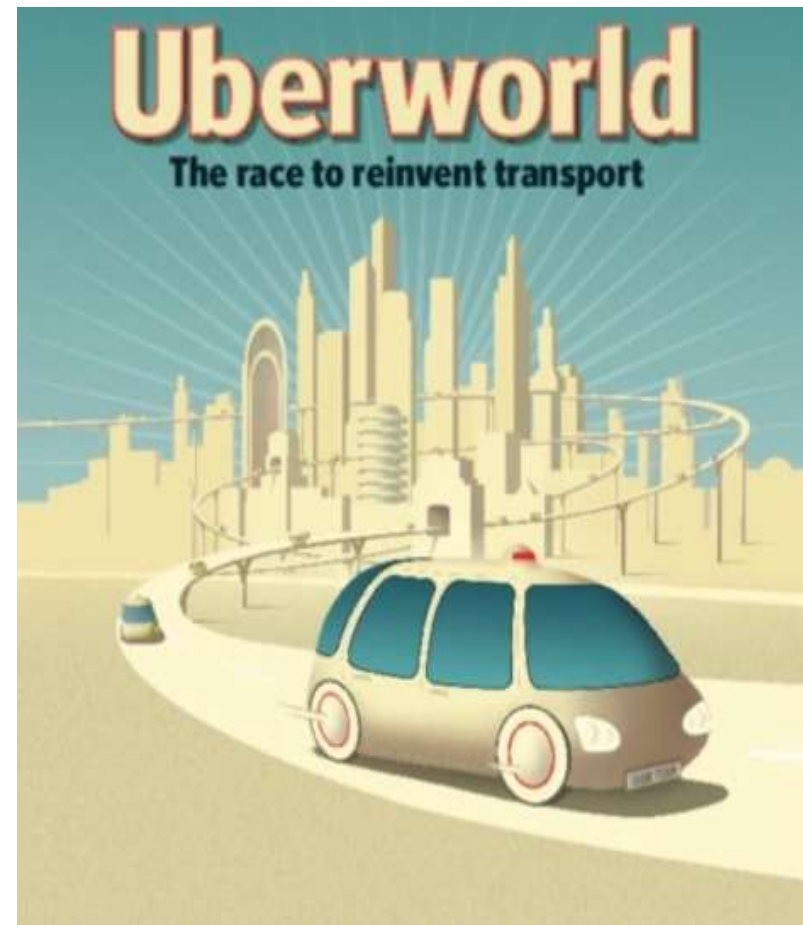
(2) Digital technologies enable **service** innovation

“Servititisation of manufacturing”

- **Smart agriculture** services offered by machinery producers
- **Car makers** provide after-sales & car-sharing services

Services innovations build on digital technologies

- **Retail** innovation based on data analytics, augmented reality & IoT





(3) Innovation **cycles** are faster

- Accelerated **design, prototyping & testing** with 3D-printing & virtual simulation
- Release of **pilot versions** to the market
- Regular **upgrading** (based on consumer's feedback)
- Flexible manufacturing enabling **small series production** at low cost (allowing more personalisation)





(4) Innovation is more **collaborative**



Collaboration takes different forms & facilitates efficiency gains (scale):

- **Data sharing**
- Business **incubation & acceleration** programmes
- **Partnerships** with tech firms, start-ups, public research
- Corporate venture capital & **acquisitions**
- **Platforms** & other innovation ecosystems (incl. crowdsourcing; industry platforms)





Digital innovation is changing market structures & dynamics



Market concentration

- Expanding digital production at little cost (**scale without mass**) favours dominant players
- Scarcity of skills to exploit data leads to **concentration in few hotspots**

Market entry & competition

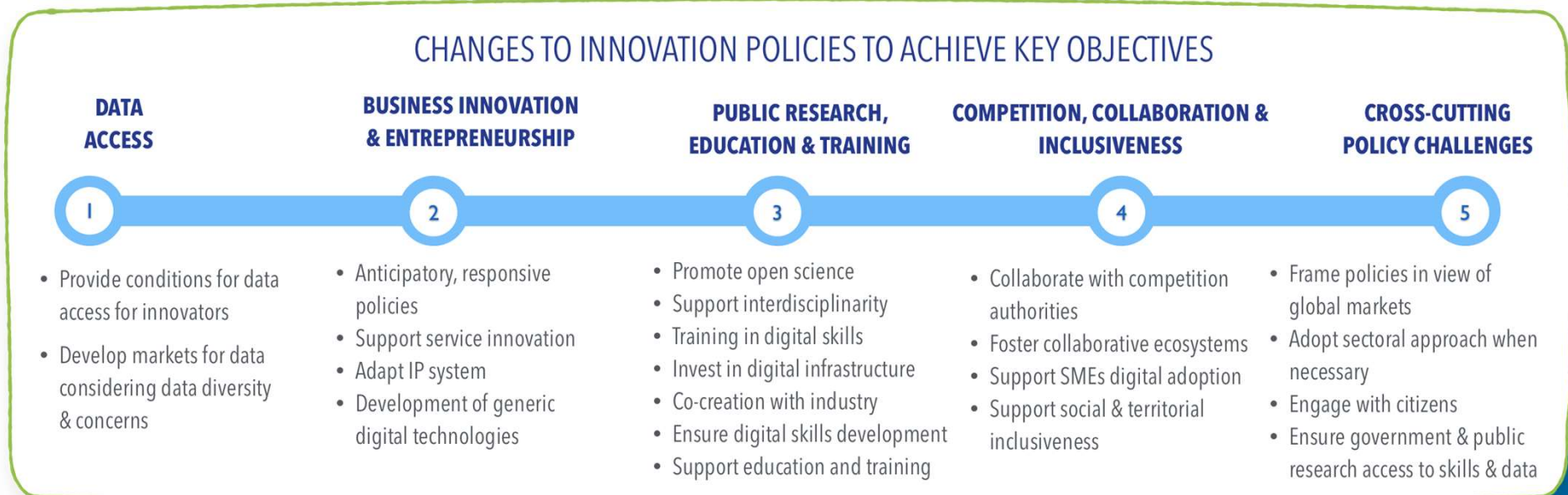
- Data access **lowers cost of market entry**
- Platforms can facilitate **entrepreneurship**





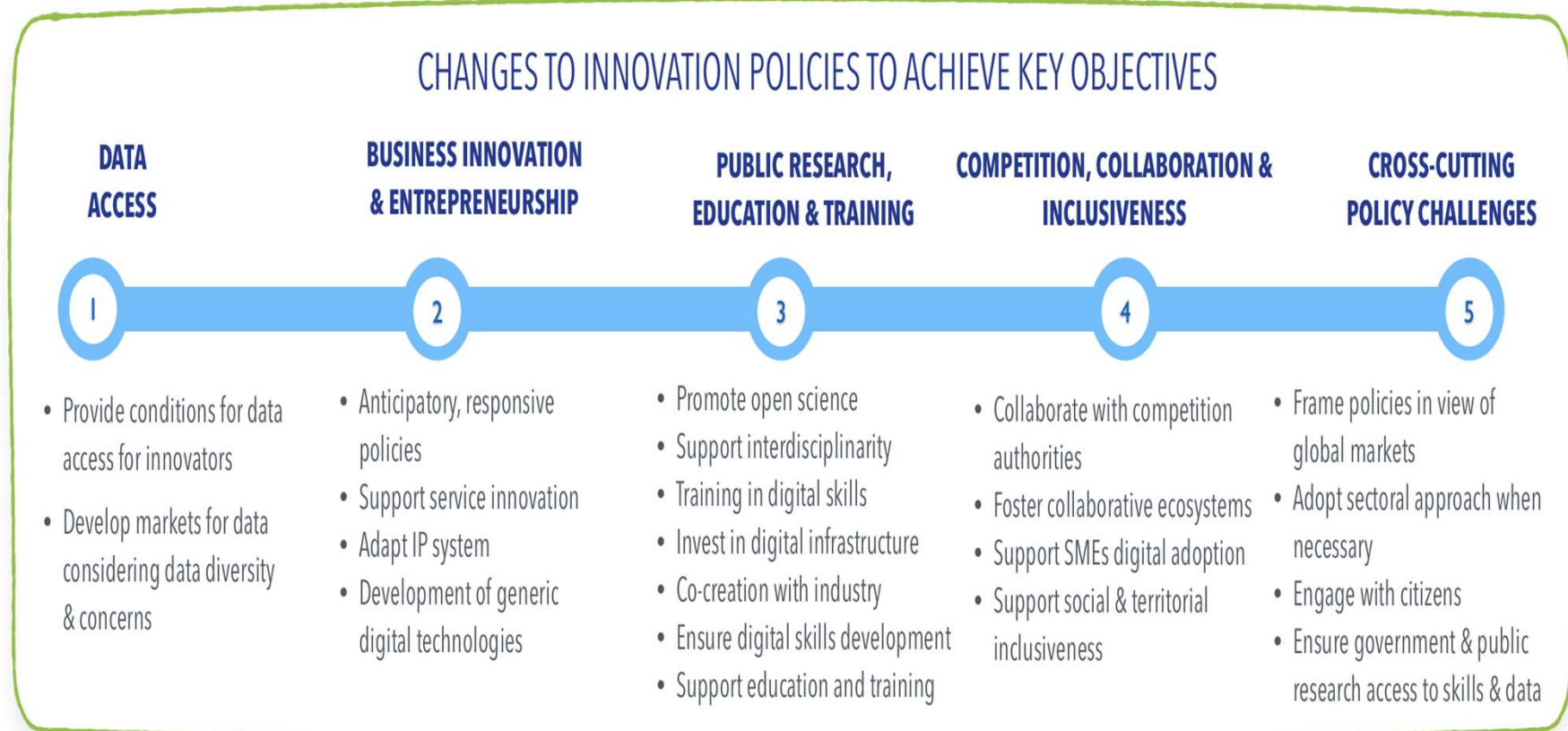
Changes are needed across the entire innovation policy spectrum

- Innovation policies have to change to adequately support innovation in the digital age
- All domains of innovation policies are affected but to different extents with the following key priority changes:





Changes are needed across the entire innovation policy spectrum





(1) Data access policies

- Ensure **access to data for innovators**:
 - ✓ Taking into account diversity of data
 - ✓ Preserving rights & incentives to produce data
- Explore the development of **markets for data**
 - ✓ Challenges to consider (appropriability, market value, privacy, transaction costs) → could be mitigated with digital tools (Platforms, Blockchain)





(2) Innovation & entrepreneurship policies

- Ensure innovation policies are **anticipatory, responsive & agile**, e.g.:
 - ✓ Policy experiments of small scale
 - ✓ Digital tools for policy design & monitoring
 - ✓ Mission-oriented programmes
- Support **service innovation** that implements digital technologies
- Adapt **IP systems** (notably to AI challenges)
- Support development of **generic digital technologies** (including in PROs & academia)



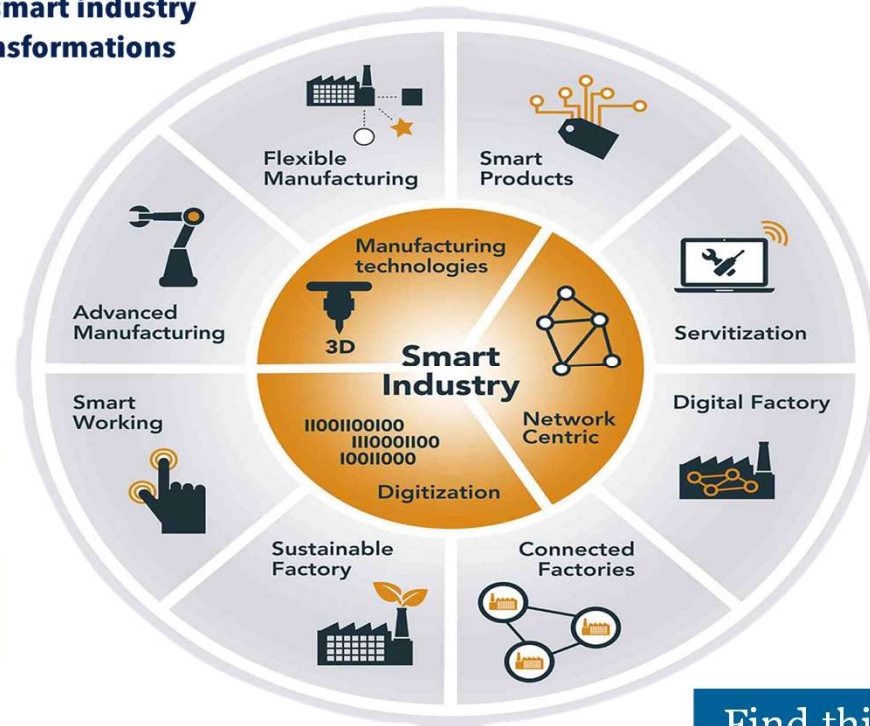


Example: Smart Industry Fieldlabs, Netherlands

What are the Smart Industry Fieldlabs?

- Shared facilities in which companies and knowledge institutions develop, test and implement Smart Industry solutions.
- Initiated in 2014
- There are currently 40 fieldlabs - Some have a regional focus, others a national or a European focus.
- Initiated by different stakeholders (e.g. public parties, firms, knowledge institutes) on average more than 20 partners

Key smart industry transformations



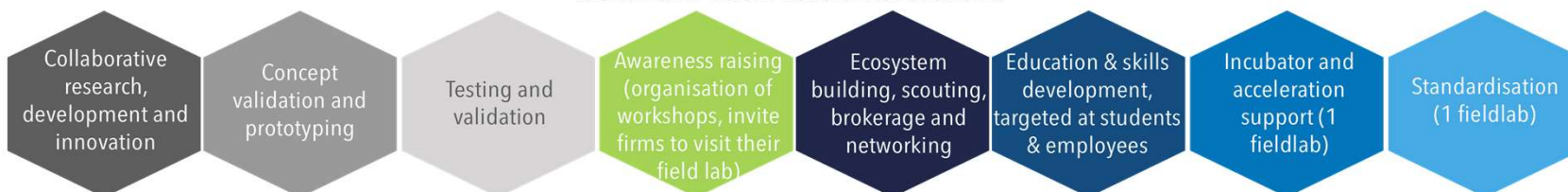
What are the main objectives of the field labs?

5 examples:

FreshTeq	Make Dutch industry the world leader in smart solutions for fully automated production, cultivation and distribution of fresh fruit and vegetables
Flexible Manufacturing	Enable the production of small series, flexible and fully automated by robots
Smart Dairy Farming / JoinData	Increasing the sustainability of dairy farming and agriculture by real-time monitoring of dairy cows and agriculture and the sharing of data in the chain.
Multimaterial 3D printing	Develop new value chains, based on the next generation of 3D printing technologies
Ultra-Personalized Products and Services	Develop new product propositions for the manufacturing industry through innovative use of data and customization of products.

Find this and other case studies at:
<https://oe.cd/2xP>

What are their main activities?





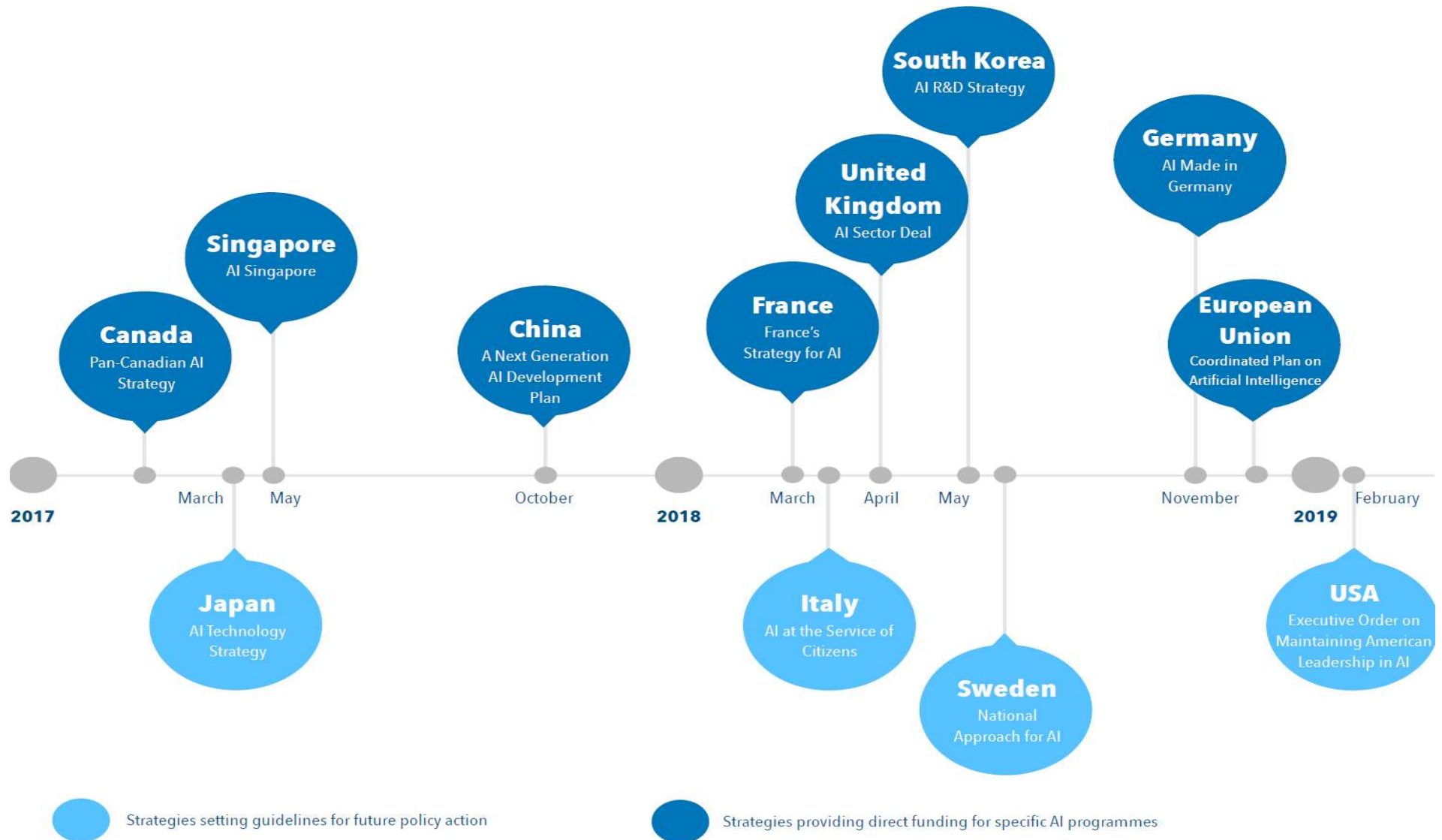
(3) Public research, education & training policies

- Promote **open science**
- Support **interdisciplinary** research & education
- Support training in **digital skills** for researchers
- Ensure **skills needed** for digital innovation are developed (e.g. revise university programmes)
- Invest in digital tools & **infrastructure** for science
- Foster **co-creation** with industry





Strategies to boost digital innovation





(4) Policies to foster competitive, collaborative & inclusive innovation ecosystems

- Foster **collaborative innovation** ecosystems
- Facilitate **digital technology adoption** by all firms (esp. SMEs)
- Support **social & territorial inclusiveness** in digital innovation activities



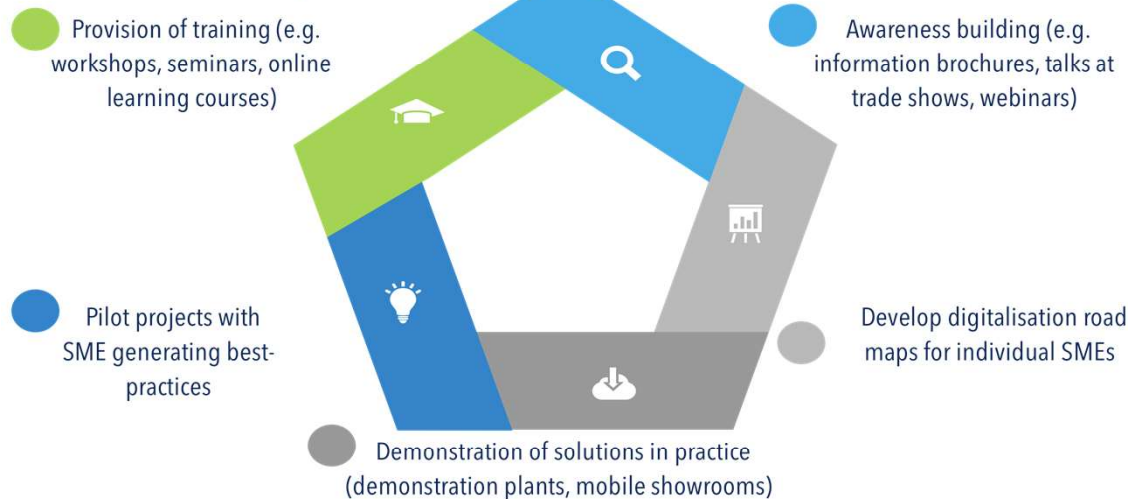


Example: SME 4.0 Competence Centres, Germany

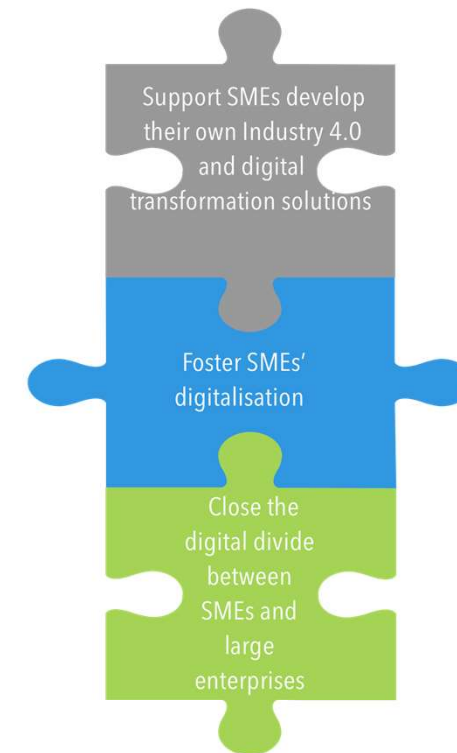
What are Mittelstand 4.0 Competence Centres?

- Network of 25 centres across Germany established and led by public-private consortia (including universities, public research institutions, chambers of commerce, transfer agencies)
- Cross-sector and cross-thematic digitalization ecosystems supporting the knowledge and technology transfer to SMEs

Business services provided



Mandate



Budget & governance



Find this and other case studies at:
<https://oe.cd/2xP>



(5) General principles for innovation policies

- Frame national policies in view of **global markets**
- Adopt a **sectoral approach** in:
 - ✓ Data access policies
 - ✓ Digital technology diffusion policies
 - ✓ Policies supporting digital technology development
- **Engage with citizens** to address technology-related concerns
- Ensure government & public research **access to skills & data**



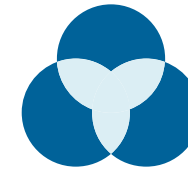


Main findings of the report



Common trends across sectors

- 1 **Data** as core innovation input
- 2 Focus on **services** innovation
- 3 **Experimentation** & versioning
- 4 **Collaborative** innovation



Sectoral differences

- 1 Digital technology **opportunities** for innovation
- 2 **Data needs** & challenges for innovation
- 3 **Adoption** & diffusion trends

- **Changes are needed in all innovation policy domains**
- A **sectoral perspective** is needed for data access & diffusion policies
- Some countries have already adopted **innovative policy approaches**



Data access

- Ensure data access for innovation, considering data diversity & privacy concerns
- Develop markets for data

- Collaborate with competition authorities in addressing market power in the digital age
- Create spaces for collaboration & co-creation
- Support digital technology adoption by SMEs
- Support generic digital technology development to respond to societal challenges

Competition, collaboration & inclusiveness



- Promote open science
- Support interdisciplinarity
- Provide training in digital skills
- Invest in digital research infrastructure

Public research education & training

- Promote anticipatory, responsive and agile policies
- Support service innovation
- Adapt IP system

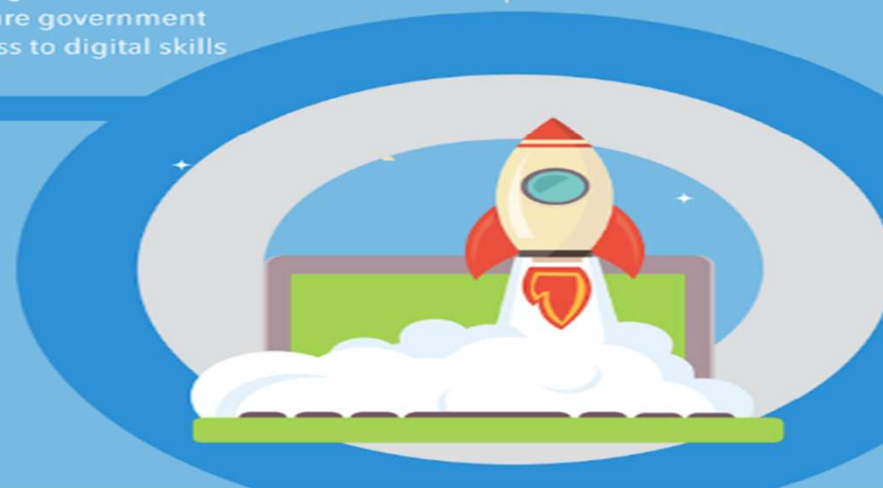
Business innovation & entrepreneurship



Cross-cutting policy challenges

- Frame policies in view of global markets
- Adopt sectoral approach when necessary
- Engage with citizens
- Ensure government access to digital skills

Disrupting the innovation policy spectrum





The report and all project materials



Digital Innovation
SEIZING POLICY OPPORTUNITIES



Project website:

<https://oe.cd/2xw>

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<https://doi.org/10.1787/a298dc87-en>



Project events

4 workshops



Paris
June 2018

[Website Summary](#)



Netherlands
April 2018

[Website Summary](#)



London
September 2017

[Website Summary](#)



Paris
June 2017

[Website Summary](#)

Report launch event



London
April 2019

<https://oe.cd/2xs>



Policy papers

Guellec, D. and C. Paunov (2018), "**Innovation policies in the digital age**", OECD Science, Technology and Industry Policy Papers, No. 59, OECD Publishing, Paris, <https://doi.org/10.1787/eadd1094-en>.

Paunov, C. and S. Planes-Satorra (2019), "**The impacts of digital transformation on innovation across sectors**", OECD Science, Technology and Industry Policy Papers, OECD Publishing, Paris (forthcoming)

Planes-Satorra, S. and C. Paunov (2019), "**The digital innovation landscape in 2019**", OECD Science, Technology and Industry Policy Papers, OECD Publishing, Paris, <https://doi.org/10.1787/6171f649-en>





Case studies

Find all country case study contributions at: <https://oe.cd/2xP>

