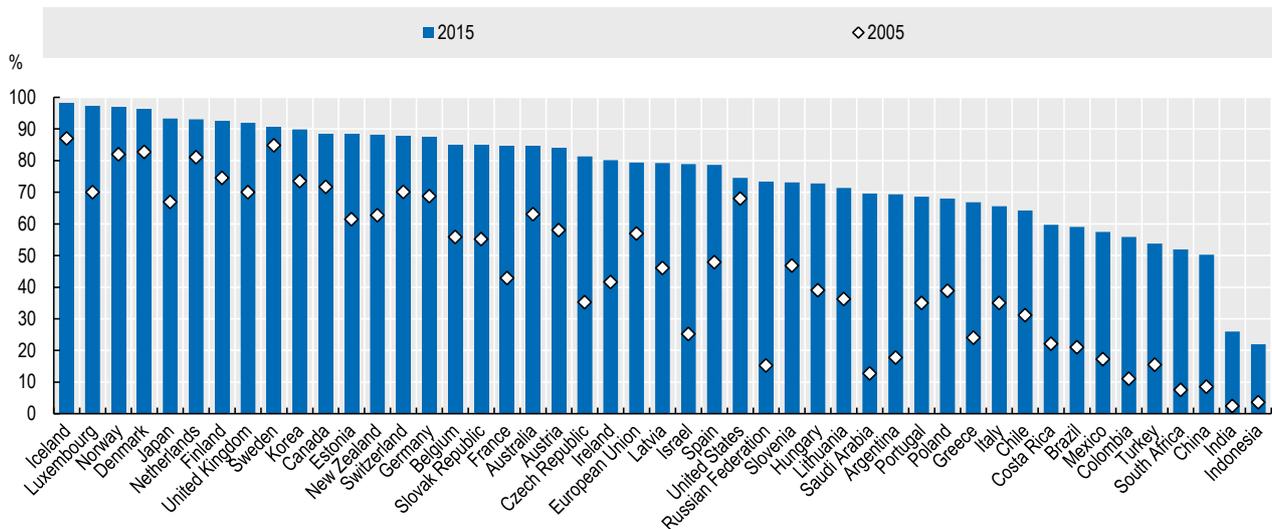


Going Digital: Making the Transformation Work for Growth and Well-being

Going digital

We are in the midst of the transition towards a digital economy and society. Although underway for nearly half a century, the pace of change has quickened. Digital infrastructures are now nearly fully deployed across OECD countries and growing quickly beyond (Figure 1), and powerful devices such as smartphones provide ubiquitous computing and access. Access has grown, from 4% to 40% of the world's population in 20 years and emerging and developing economies are increasingly using digital technologies to leapfrog ahead in areas like e-commerce, banking and health.

Figure 1. Internet users, 2005 and 2015
As a percentage of total individuals

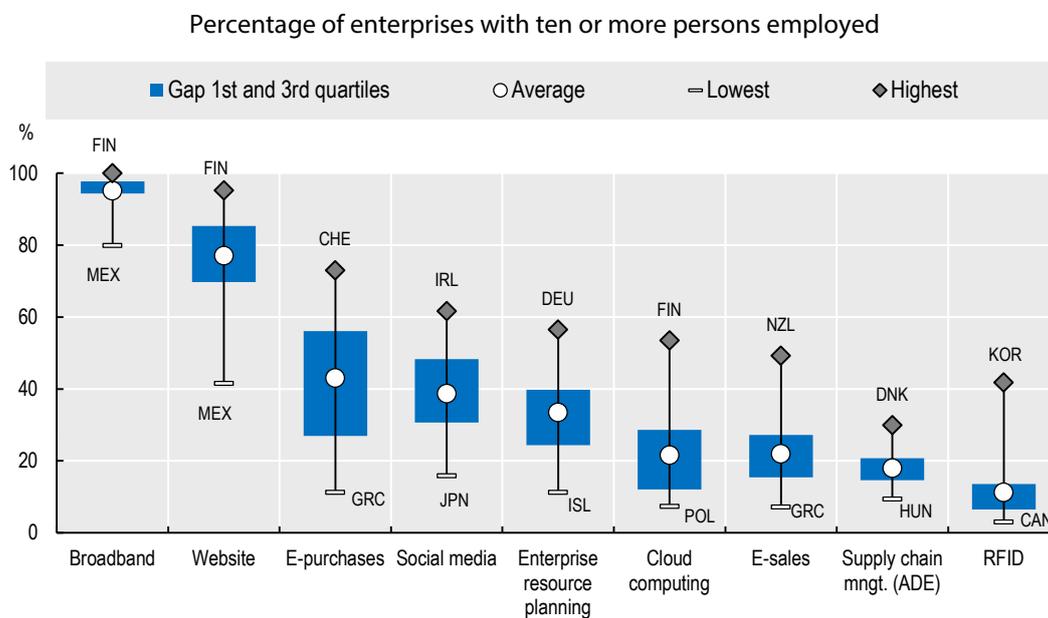


Sources: OECD, based on ITU World Telecommunication/ICT Indicators Database and Eurostat Information Society Statistics Database; January 2017.

As more people and things become connected to networks, torrents of data are generated, new technologies like block chain emerge and breakthroughs occur in artificial intelligence, it is clear that the digital transformation is still only at an early stage. While many firms now have access to digital technologies, the use of digital tools still differs greatly across countries, even among the most advanced economies (Figure 2). The ongoing digital transformation promises to spur innovation, generate efficiencies across a wide range of activities, and improve well-being as information and knowledge become more widely available and democratised. These benefits go hand-in-hand with major challenges to the nature and structure of organisations, markets, and social interactions. The digital transformation raises challenges for skills, employment, market entry, and competition, and invites rethinking on how to preserve fundamentals such as privacy, security, property, and on how to ensure inclusiveness.

The gap between “Technology 4.0” and “Policy 1.0” needs to be closed. Many public policies are a legacy of an analogue era that assumed a physical state (borders for trade policy, nexus for taxation, and fences for property ownership) and are ill-adapted to the digital era. Likewise, policy makers sometimes lack an understanding of the changes underway and seek to tinker with existing policies instead of proactively developing new approaches.

Figure 2. The diffusion of selected ICT tools and activities in enterprises, 2015



Sources: OECD, *ICT Database*; Eurostat, *Information Society Statistics Database*; and national sources, April 2016.

Across the OECD membership and beyond, the reaction to the digital transformation is mixed. Some countries take a strategic whole-of-government approach to leveraging its benefits while others make piecemeal decisions to contain or roll back the consequences of specific incidents (e.g. security breaches) or the impacts of new technologies or applications.¹ In many cases, governments have been caught off-guard – be it by embedded code programmed to evade emission tests, the inherent lack of security in the “Internet of Things”, or the difficulty in taxing digital sources of value – and have made policy decisions in silos.

In the interconnected digital environment, the lack of a holistic approach increases the risk that policies in one area will have unintended, possibly adverse impacts on another. For example, restrictions on ride-sharing schemes can impose barriers for those without cars to get to work, lead to inefficient use of urban spaces, and frustrate policies aimed at supporting the aged. New opportunities such as “smart homes” require co-ordination of policies in areas ranging from transport, energy, housing and communications to education and health care.

With the development of big data analytics, machine learning and artificial intelligence, the broader policy community must ensure that digital transformation is used to improve the collective well-being. This requires understanding the challenges, working collectively to learn from each other and devising policies that help people in adjusting to the transition. The window for action is now, so as to have effective measures and strategies in place when they are needed.

The OECD’s project on the digital transformation

The OECD is undertaking an ambitious two-year project (2017-18) that exploits its policy breadth and international purview to examine how the digital transformation affects policymaking across a large spectrum of policy areas, including competition; consumer policy; digital economy policy (privacy, security, infrastructure, economic impact); science, technology and innovation; industry and entrepreneurship; insurance and private pensions; financial markets; fiscal affairs and taxation; statistics; economic policy (monetary, fiscal and structural); education and skills; employment and social affairs; public governance; and trade.

This project will take advantage of lessons drawn from OECD's "New Approaches to Economic Challenges" which, in the wake of the global financial crisis, involved a comprehensive organisation-wide reflection on how to renew and strengthen the OECD's analytical frameworks, policy instruments and tools. Similar to that work, responding to the digital transformation will require fundamental rethinking of policies across many different areas.

The project will draw on national experiences and policy experimentation occurring across the OECD's 35 member countries,² its accession countries,³ key partners⁴ and many other economies involved in the OECD's work. These countries offer a rich diversity of approaches, challenges and levels of development. Added impetus will come from the digital economy work stream initiated under the Chinese G20 Presidency in 2016 and continued under the 2017 G20 Presidency of Germany as well as the ICT G7 Ministerial organised by Japan in 2016 and followed by Italy in 2017.

The project will be led and coordinated by the OECD's Committee on Digital Economy Policy (CDEP) which has analysed the growth of the digital economy for 25 years. The Committee has developed widely cited and accepted "soft law" on key issues such as trans-border data flows (1985), privacy (1980, 2013), security (1992, 2002, 2008, 2015), cryptography (1997) and internet policy making (2011).

The project envisions a range of reports and recommendations on select policy issues produced by each policy area involved in the project, as well as policy brochures, country profiles and databases, a synthesis built on horizontal insights and good practices, and possibly a "toolkit" of policy "dos" and "don'ts" for the digital era. The project is designed to actively engage with governments, stakeholders, and independent experts, including through workshops and roundtables planned in various countries before, during and after the analysis has been completed.

Why the OECD?

The world does not lack white papers and policy briefs on ICT and digital economy policy. Governments, other international organisations, private sector think tanks and consultancies have been prolific. But the OECD is uniquely positioned to reduce the gap between technology and policy, because of its unique strengths:

1. Its breadth of policy expertise both from specialised policy communities that work through the OECD, and the supporting OECD staff, that cover nearly all policy fields, enabling a whole-of-government perspective. This breadth of expertise is reflected in a wide range of existing work relevant to digital transformation, as documented in the appendix.
2. An ability to work transversally across different parts of the organisation and external policy communities – in a "horizontal" way – that has evolved in practice over the last twenty years.
3. Direct access to policy makers and stakeholder communities from a wide variety of countries, many of which have been at the forefront of the transformation. This diversity provides valuable insights into policy practices and experiences, while allowing broad and detailed engagement.

These characteristics enable the OECD to analyse the digital transformation underway, provide advice and policy recommendations, prepare governments to exploit and promote the benefits, and help address the inevitable challenges.

Designing a whole-of-government approach for navigating the digital transformation

Three methodological pillars will collectively constitute a framework for the project:

Pillar 1: *a framework for analysing digitalisation across policy areas*

Pillar 2: *an in-depth analysis of digitalisation in specific policy domains and in the broader economy*

Pillar 3: *a set of modules focusing on key cross-cutting issues.*

Pillar 1: A framework for understanding the various dimensions of the digital transformation

The framework (Pillar 1) is the foundational element and will be the initial focus of work. This pillar consists of two axes. *The first is a description of the quantitative and qualitative degree of digital development by policy domain.* A preliminary set of defining questions for each policy domain include: What has been the impact? What are the key digital technologies affecting the policy area? Who are the winners and losers from the transformation? What are the perceived barriers and stumbling blocks encountered? How have countries experimented with policy change? Are there examples of good practice policies that facilitate the positive impact of the digital transformation in the policy domain and in the broader economy? Are there any ethical dimensions related to digital technologies that need to be addressed?

The second axis seeks to describe some of the key drivers of digital transformation which have a wide impact across economy and society, thus affecting many policy areas (general purpose technologies). It translates technological properties into "drivers of digital transformation" that underpin innovation and disruption across economy and society, and that affect policymaking across different policy areas. Box 1 provides a short summary based on a longer paper that is under development. The intent is to identify these digitally enabled drivers of change that policy makers in many fields will need to analyse and address in order to achieve their policy objectives in the digital era.

For the project, these two axes are intended to help generate a well-linked narrative as well as a set of indicators that provide a whole-of-government view of digital transformation and of how policies may need to adapt. Pilot tests of Pillar 1 may be conducted in Sweden, Austria and Colombia.

Box 1. Transformative digitally enabled vectors of change

The digital transformation of economy and society triggers change in many areas. The preliminary list of seven digitally enabled "vectors of change" below characterises directions of the transformations that have implications in more than one – if not many – policy domains. They offer a higher-level view and cross-cutting approach to describing the digital transformation and its effects to help generate a well-linked narrative. A stand-alone paper provides more details about these vectors, their possible policy implications, and their enabling technologies.

Relevance of borders and locations: The Internet and other networks enable interactions and value creation regardless of location and borders.

Speed: Digital technologies¹ accelerate interactions and the transformation of economic and social activity, generating economic and social opportunities and disruptions.

Data as a primary resource: The increasing generation, storage, use and analysis of large amounts of data make data a new resource for economy and society.

Digital "service-ification": The value of many assets and goods increasingly lies in the service that their digital components can provide and/or the potential to consume them as a service.

Scale without mass: Digital technologies facilitate and/or enable organisations to scale – fast and globally – without accumulating tangible assets (mass).

Digital intermediation: Online platforms are matching supply and demand of goods, services and information – including among peers – creating new markets and/or changing existing ones.

Digital social interactions: Digital technologies enable/empower new forms of interactions and behaviour among all sorts of actors, including individuals, communities, businesses and governments. In many cases this disrupts and/or displaces existing social networks and norms.

1. These vectors are enabled by a set of mutually-reinforcing digital technologies such as the Internet, digitisation, big data analytics, cloud computing, artificial intelligence and physical-digital technologies.

Pillar 2: In-depth analysis of the digital transformation in specific policy areas and across the economy

The second pillar of the project would consist of work that all partnering OECD policy communities will undertake as part of their individual programmes of work. In this regard, specific issues will be addressed like the impact of the digital transformation on international trade, the development of a digital skills strategy, the implications of digitalisation on tax policies and the future of work.

As in the first pillar, work by all partnering OECD policy communities would include both qualitative analysis as well as quantitative indicators that show the extent, nature, benefits and challenges of digital transformation in each of the policy areas and across the broader economy. The key insights from both elements of Pillar 2 will help inform a horizontal synthesis report and other final deliverables; they will also contribute to the refinement of the framework (Pillar 1) in a second stage.

Pillar 3: Cross-cutting modules and key questions

The third pillar of the project would involve narrowly focused research in priority areas to try to gain insights into the prominent questions policy makers face in the digital era, many of which reside at the intersection of more than one policy area. The approach to this third pillar involves establishing small groups from across the OECD secretariat to provide a multidisciplinary analysis to these issues that can then be discussed with governments and stakeholders. The preliminary candidates listed below reflect areas where the OECD has laid groundwork for early progress.

Module #1: Jobs and skills in the digital economy

The digital transformation is already affecting individuals not only by changing the demand for skills but also by disrupting entire industries. There is an urgent need to know where new jobs will come from, what they will look like and which skills will be required (ranging from general purpose skills to specialist skills for those who develop the infrastructure and applications), and what can be done to create the new jobs. There is also a need to understand the links between the digital transformation, globalisation and jobs and how policies can help ensure that effective adjustment mechanisms are in place to help individuals navigate the transition between jobs. How can policies help spur job creation and job quality in an increasingly data-driven and digital economy? How can education systems, individuals and the private sector work together to ensure that individuals have access to the "skills for life" that are essential to enabling all individuals to safely participate in a digital society? What are examples of effective adjustment mechanisms and can any general lessons be learned?

Module #2: The implications of the digital transformation for competition and market structure

Digital technologies can be disruptive, enabling new market entrants while challenging incumbents and existing business models. Digital technologies also pose new challenges for regulators. The ability to deliver digital products instantaneously with almost zero marginal costs anywhere and anytime in the world has propelled firms and platforms to global scale and challenged legacy regulatory frameworks. A review of existing policies and regulations is needed to ensure they facilitate innovation, trade and investment, structural change, job creation and productivity growth across the economy, including in markets dominated by digital platforms. How can competition policy help make markets more efficient? Does it have a role to play in other areas that are not traditional competition concerns, such as privacy? How can policymakers ensure that policy settings will be robust in a fast-evolving environment? Which policies will best help businesses and individuals adapt and excel? To what extent should digital platforms be regulated? Are existing policy tools sufficient?

Module #3: Measuring the digital transformation

Designing better policies for a digital economy and society requires further efforts to improve measurement and evidence. The digital transformation raises challenges for the measurement of growth and productivity. New opportunities are also emerging thanks to digital technologies, e.g. through the use of big data analytics and non-official data sources. Statistics could be enriched with more timely, more granular and less costly data. Could this foster data-driven public sectors willing and able to leverage the use of data as key strategic resource? How should emerging areas such as trust and the Internet of Things be measured? Is it possible (and desirable) to develop robust estimates of cross-border data flows and Internet openness? How should macroeconomic statistics be improved to better reflect the dynamics of the digital economy?

Module #4: Making the digital transformation work for society and well-being

Access to digital technologies can affect people's well-being in a variety of ways, both positive and negative. While digital technologies can help improve the design and delivery of public services, this will only happen if individuals have the necessary skills to use digital tools. There might be additional elements to consider in mitigating the negative impact of the digital transformation on the need to ensure equal access opportunities to public services. Similarly, trust underpins the entire digital economy. More needs to be done to strengthen trust in an age of increasing connectivity and data-intensive activities that span jurisdictions and organisations. How can individuals, businesses and governments work together to protect consumers and ensure digital security and privacy? What are the trade-offs between the use of machine learning techniques and algorithms and ethical/legal/political concerns, including within the public sector? How should digital government initiatives evolve? How can we assess and ensure the well-being of all actors across the digital economy?

Module #5: The implications of digital technologies on policy design, implementation and reform

Digital technologies not only have important implications for firms and individuals, they also provide myriad opportunities for innovation and improvement in policy design, implementation, evaluation and enforcement. Due to the increasing application of digital technologies in all sectors of the economy, the volume of potentially exploitable data related to underlying conditions and pressures, individual and firm behaviour, and their downstream consequences is growing rapidly. This can reduce the cost of formulating and achieving policy objectives. Compared to the common practice of trial-and-error policy making, such exercises have the potential to greatly improve policy evaluation and design. How can lower administrative, coordination, and communications ensure more productive stakeholder involvement, cooperation, and policy implementation/enforcement? How should digital technologies be applied to better target and monitor desired policy outcomes and improve performance and delivery of public service? How can they reduce monitoring costs and more generally result in improved and reduced-cost delivery of public services?

Conclusion: inviting feedback

This note is preliminary and meant to initiate discussion across various policy communities – governments, business, civil society, the technical community, academia and the general public. The scope, content and structure of the project will become more fully formed in the coming months. As a result, all comments and suggestions are actionable at this stage, although we would particularly be interested in any views on the following important questions:

1. General questions on the digital transformation:

- Today's political economy is shaped by dominant stakeholders, largely business, who have significant influence on the shape and direction of policy even though the transformation is typically led by new players/entrants. Is this a problem? How can the process be better balanced?
- Inequality is a growing problem across the OECD and much of this is attributed to technology. Why or why isn't this true? How can the digital transformation be used to reduce inequalities?
- What is the incidence of positive feedback loops in the digital environment? What are the implications for economic, social, and political interaction?
- The digital transformation has been characterised as simultaneously combining high-levels of fear and hope. What are your greatest hopes and fears?

2. Specific questions on the structure and content of the project:

- How can the OECD have the most impact with this project? What outcomes and deliverables would be best?
- On Pillar 1, are the "drivers of the digital transformation" the right ones? What would you add/change?
- In Pillar 2, what issues should be the focus in policy areas such as competition, innovation and labour?
- For Pillar 3, research needs to be focused on a few narrowly focused areas to gain insights into the key questions we face in the digital era. In your opinion, which questions should we address?

Notes

1. “Brussels urges light-touch rules for ‘sharing economy’ business,” *Financial Times*, 31 May 2016, <https://www.ft.com/content/4c19a666-267f-11e6-8ba3-cdd781d02d89>.
2. The 35 members of the OECD are Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain; Sweden, Switzerland, Turkey, the United Kingdom and the United States.
3. Countries currently involved in the accession to the OECD include Colombia, Costa Rica and Lithuania.
4. Key partners to the OECD are Brazil, China, India, Indonesia and South Africa.

Selected OECD reading on the digital transformation

- OECD (2016a), *Consumer Protection in E-Commerce – OECD Recommendation*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264255258-en>.
- OECD (2016b), *Broadband Policies for Latin America and the Caribbean – A Digital Economy Toolkit*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264251823-en>.
- OECD (2016c), *Innovating Education and Educating for Innovation – The Power of Digital Technologies and Skills*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264265097-en>.
- OECD (2015a), *Digital Security Risk Management for Economic and Social Prosperity*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264245471-en>.
- OECD (2015b), *The Future of Productivity*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264248533-en>.
- OECD (2015c), *Data-Driven Innovation – Big Data for Growth and Well-being*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264229358-en>.
- OECD (2015d), *OECD Digital Economy Outlook 2015*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264232440-en>.
- OECD (2015e), *Addressing the Tax Challenges of the Digital Economy, Action 1 – 2015 Final Report*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264241046-en>.
- OECD (2015f), *Students, Computers and Learning – Making the Connection*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264239555-en>.
- OECD (2015g), “Making Open Science a Reality”, *OECD Science, Technology and Industry Policy Papers*, No. 25, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jrs2f963zs1-en>.
- OECD (2015h), *Health Data Governance – Privacy, Monitoring and Research*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264244566-en>.
- OECD (2014a), *Measuring the Digital Economy*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264221796-en>.
- OECD (2014b), *Recommendation of the Council on Digital Government Strategies*, OECD, Paris, www.oecd.org/gov/digital-government/Recommendation-digital-government-strategies.pdf.
- OECD (2013a), “Empowering and Protecting Consumers in the Internet Economy”, *OECD Digital Economy Papers*, No. 216, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k4c6tbcvqv2-en>.
- OECD (2013b), *ICTs and the Health Sector – Towards Smarter Health and Wellness Models*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264202863-en>.
- OECD/ITF (2015), “Big Data and Transport: Understanding and Assessing Options”, *International Transport Forum Policy Papers*, No. 8, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jlvwzdb6r47-en>.

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