OECD Science, Technology and Innovation Outlook 2016

Policy Profile

Innovation and the digital economy

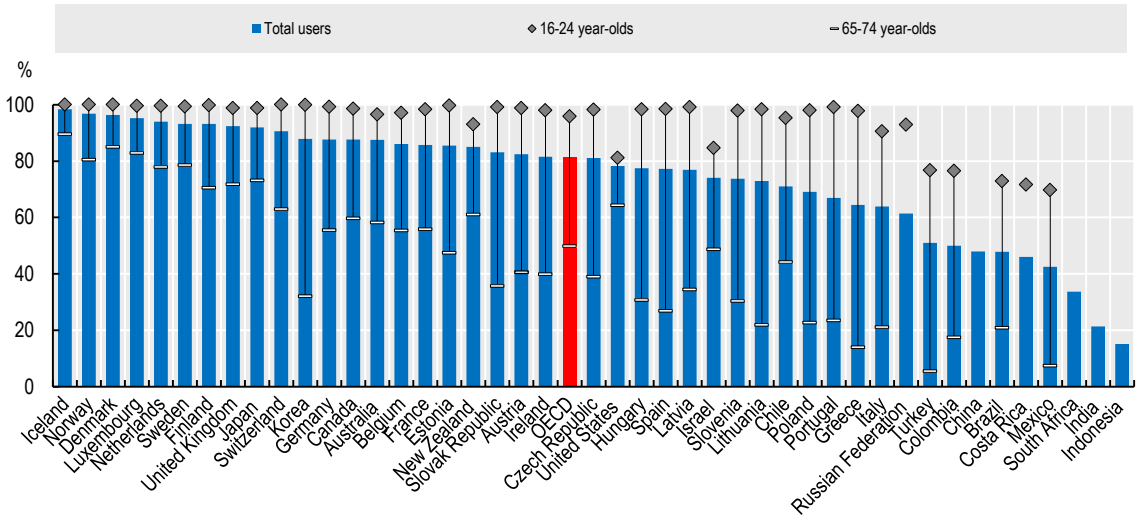
Rationale and objectives

Governments in many countries are increasingly aware of the importance of harnessing the benefits of the digital economy for innovation, growth and social prosperity. This awareness comes as the cost of data collection, storage and processing continues to decline dramatically and computing power increases, social and economic activities are increasingly migrating to the Internet. Technologies, smart applications and other innovations in the digital economy can improve services and help address policy challenges in a wide range of areas, including health, agriculture, public governance, tax, transport, education, and the environment, among others. Indeed, information and communication technologies (ICTs) contribute not just to innovation in products, but also to innovation in processes and organisational arrangements.

At the same time, Internet usage continues to vary widely across OECD countries and among social groups. In 2014, at least 95% of the adult population accessed the Internet in Denmark, Iceland, Luxembourg and Norway, compared to less than 50% in Mexico and Turkey. Differences in Internet uptake are linked primarily to age and education, often intertwined with income levels. In most countries, uptake by young people is nearly universal, but there are wide differences for older generations (Figure 1). Over 95% of 24 year-olds in the OECD used the Internet in 2014 compared to less than 49% among 65-74 year olds.

Figure 1. Internet users by age, 16-24 and 65-74, 2014

As a percentage of population in each age group



Source: OECD (2015c), based on OECD, ICT Database; Eurostat, Information Society Statistics Database; ITU, World Telecommunication/ICT indicators Database and national sources, July 2015. See original source for detailed footnotes and references, data available at: http://dx.doi.org/10.1787/888933274795.

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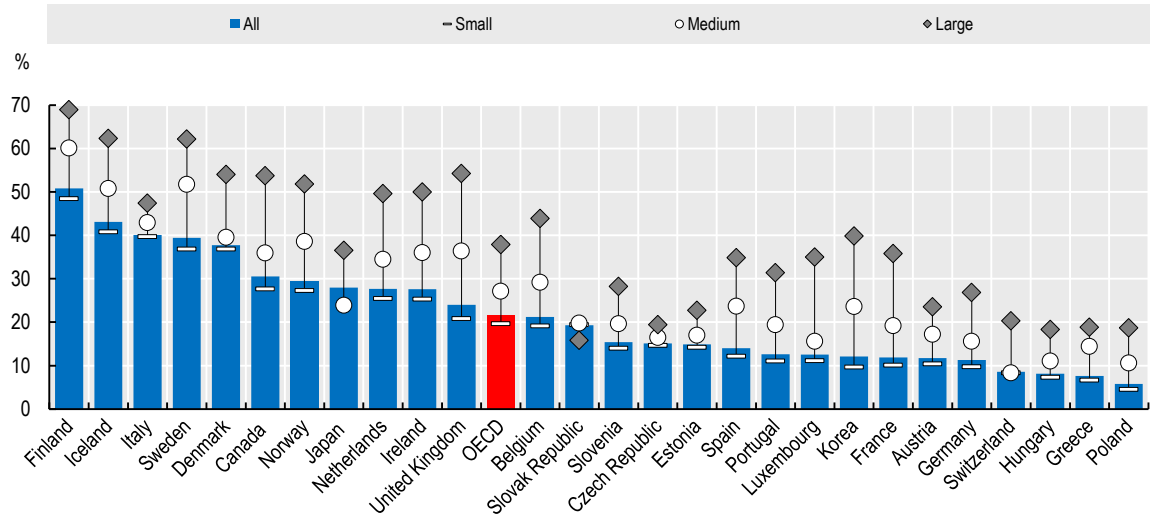
There remains significant scope for increased adoption and use of ICTs and the Internet to boost growth through innovation in goods, services and business processes across all sectors. However, there are still large differences in the use of technologies. Small and medium sized enterprises (SMEs) tend to significantly lag in the uptake and use of ICTs (Figure 2), dragging down aggregate productivity and limiting the inclusiveness of this transformation.

Figure 2. Enterprises using cloud computing services, by size, 2014

As a percentage of enterprises in each employment size class



Source: OECD (2015c), based on OECD, ICT Database; Eurostat, Information Society Statistics Database, July 2015. See original source for detailed footnotes and references, data available at: http://dx.doi.org/10.1787/888933274459.

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As well as a catalyst for growth, ICT and technological innovations may be disruptive, with far-reaching effects on productivity, employment and well-being. Indeed, while new technologies create opportunities for businesses (especially SMEs), workers and citizens to engage in economic activity, these technologies are also likely to displace workers in specific occupations and may further increase existing gaps in access and use, resulting in new digital divides and greater inequality.

In recent years, online platforms have created and affected many service markets, often enabling individuals to buy directly from peers. Individuals and organisations can now exploit idle assets such as homes and cars, or monetise labour and skills to deliver services including accommodation (Airbnb) and mobility (Uber), among others, via these online platforms. Other new technologies that have the potential to be both transformative and disruptive include cloud computing, "big data," and artificial intelligence. This is particularly relevant as the "Internet of Things," and with it billions of interconnected devices, becomes a reality (see Chapter 2 on *Future Technology Trends* for a more in-depth discussion).

Successfully leveraging the innovation and growth potential of the digital economy requires high-quality and competitively-priced access to communications infrastructure, which provides the base on which applications and services in the digital economy are built. It also requires sufficient trust in the reliability and security of networks, the respect of privacy and consumer rights. With the increasing large-scale collection and analysis of data, it is essential to address digital security and privacy challenges as an economic and social risk.

Major aspects and instruments

Numerous factors contribute to the extraordinary creativity and innovation enabled by ICTs and the Internet, including intellectual property protection for creative endeavours and low barriers to entry which have facilitated the creation and deployment of new technologies, products and services. Governments intend to take advantage of the openness of the Internet to promote the free flow of information, research, innovation, and entrepreneurship, as well as basic and applied research on the Internet and collaborative knowledge and innovation networks. In developing and implementing all of these policies and practices, a flexible, multi-stakeholder approach to Internet policymaking that brings together governments, business, trade unions, civil society and the Internet technical community, as well as inter-governmental co-ordination is essential.

High-speed networks and services are essential for future economic growth, job creation and competitiveness. Public policies aims to promote robust competition in the provision of high-speed broadband Internet and promote investment in these networks to attain the greatest geographic coverage. Governments also allow users to access a diversity of content, on non-discriminatory terms, including the cultural and linguistic content of their choice.

There is a need to address digital divides that otherwise act as barriers to inclusion, and to deploy the Internet of Things in areas such as health, transport and energy with a view to improving economic competitiveness, the environment and well-being. Governments have a key role to play in providing people with the right skills to succeed in the digital economy.

The entrance of online platforms has triggered reactions from incumbents and policy makers, as the activities and transactions enabled by these platforms are challenging existing laws and regulations, which often date from times prior to the use of smartphones and the mobile Internet. As a result, issues arise, for example, related to competition, the status and protection of workers providing services over platforms, and the protection of consumers buying from peers. In addressing such issues, policy makers are faced with the challenge of fostering the innovation and consumer benefits arising from online platforms, while protecting competition and ensuring appropriate regulatory compliance.

Strong privacy protection is critical to ensuring that the social and economic potential of the digital economy is realised. Governments aim to develop national privacy strategies that incorporate a whole-of-society perspective to promote effective privacy across jurisdictions while providing the flexibility needed to take advantage of digital technologies for the benefit of all. Privacy could be protected based on globally recognised principles, such as the OECD Privacy Guidelines, and governments work to achieve global interoperability by extending mutual recognition of privacy frameworks that achieve the same objectives.

National digital security strategies also play a key role in fostering trust and confidence in the digital environment by creating the conditions for all stakeholders to manage digital security risk in their economic and social activities. The *OECD Recommendation on digital security risk management for economic and social prosperity* (2015d) provides principles to ensure that digital security measures fully support the economic and social activities at stake and dot not undermine them. It also provides recommendations for governments to develop national digital security strategies that foster trust and confidence in the digital environment. Furthermore, it is important to address the distinct challenges that SMEs face in managing these risks. The implementation of internationally-recognised, market-driven security standards and best practices to promote online security should also be encouraged.

Recent policy trends

Governments in many countries are increasingly aware of the need to develop the digital economy in a strategic manner, to expand its benefits and respond to key challenges such as reducing employment and inequalities, and lifting people out of poverty. Today's national digital strategies cover issues ranging from business creation and productivity growth to public administration, employment and education, health and ageing, environment and development.

Most OECD countries and many partner economies have established or are close to adopting national strategies addressing policy priorities related to the digital economy. Germany's Digital Agenda 2014-17 highlights "the increased exploitation of the potential of innovation in order to achieve further growth and employment" as its primary objective (in addition to enhancing high-speed networks and trust). Mexico's National Digital Strategy (2013) aims to make Mexico "the leading country in digitization in Latin America" with a strong focus of fostering innovation and entrepreneurship in the digital economy, among other priorities. In Brazil, the Strategic Programme for Software and Information Technology Services (TI Major) (2012) is a broad programme designed to enhance Brazil's performance in the ICT sector, with a focus on innovation, entrepreneurship and competitiveness.

Colombia's Plan Vive Digital (2010) includes the Digital Talent Initiative, Apps.co for digital entrepreneurship and the Digital Content Initiative. Colombia's FITI initiative includes the ambition to support the formation of over 59 000 new IT professionals in Colombia through forgivable loans and the promotion of scholarships awarded by higher education systems and private enterprises.

Mexico's Creative Digital City initiative aims to create an urban "ecosystem" that concentrates the creative industries (film and television studios, mobile apps, interactive media, etc.) to harness the creativity and talent of people in Guadalajara together with the use of technology to boost innovation with a view to maximising the economic, environmental and social benefits.

Germany's Initiative on Smart Networks (2015) aims to strengthen basic infrastructures, develop co-operation across infrastructure sectors, improve framework conditions, and increase participation of stakeholders at an early stage, with the ambition to broaden and deepen the integration of applications and smart networks. Another programme under the Digital Agenda seeks to help SMEs and skilled craftspeople understand the importance of using software for business processes and to support these firms in digitising their business procedures.

Recent policy attention has focused on promoting the open, distributed and interconnected nature of the Internet, while ensuring privacy protection and managing digital security risk to reinforce trust in the digital economy.

- In 2013, the UK launched the Cybersecurity Information Sharing Partnership (CiSP), a joint industry-government initiative to share digital threat and vulnerability information in real time in order to increase overall situational awareness of the digital threat and therefore reduce the impact on UK business. This free service, which provides a framework that protects the confidentiality of shared information, has grown considerably with over 1700 organisations and 4400 individuals signed up as of February 2016.

- In September 2015, the Japanese National Diet amended the Personal Information Protection Act to add new definitions for sensitive and anonymised personal information as well as new rules for cross-border transfers. A key element of the updated Japanese privacy legislation is the establishment of the Personal Information Protection Commission in 2016, an independent agency supervising the protection of the rights and interests of individuals in this area.

In terms of trying to bridge digital divides, in 2013 China launched its national Broadband China Strategy which aims to connect 98% of Chinese villages to fixed broadband with a speed reaching 2 Mbps by 2020. China Telecom has also partnered with Alibaba Group to promote low-priced smartphones in rural areas. Other smartphone manufacturers have since joined this joint venture.

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