Introduction

This Spotlight on Korea is based on the data and insights presented in the OECD Digital Economy Outlook 2017. It highlights major digital developments in Korea that are crucial to leverage the potential and harness the opportunities of the digital transformation.

Digital transformation of the economy and society is underway across the OECD. Increasingly advanced usage of digital technologies and digital innovation are enabling new business models, changing the organisation of life and work, affecting existing markets and creating new ones. Digital transformation brings a wealth of opportunities, but also policy challenges. Governments need to step up in navigating this transformation to make it work for growth and well-being.

Korea has solid foundations to enable the digital transformation and leverage its potential. Korea's ICT sector is a resilient pillar of the country's economy. It is a driver of innovation, boosting high shares of value added and employment as a percentage of total value added and total employment; high ICT business expenditure on research and development; and more ICT related patents as a percentage of total IP5 patent families than any other OECD country. Not surprisingly, Korea is one the world’s top 10 exporters of ICT goods. Korea also outperforms many OECD countries in fixed and mobile broadband networks with very high penetration of fibre (74%) in fixed networks and well-developed mobile broadband. Broadband prices are decreasing and mobile data usage grew by 46% per mobile broadband subscription between 2015 and 2016. With a test of 5G deployment at the 2018 winter Olympics in Pyeong Chang, Korea is expected to lead on 5G developments.

To fully harness digital opportunities, Korea needs to foster increased use of advanced digital tools. Internet usage in Korea is high, with an average of 90% of all individuals using the Internet and a very high usage rate among the young (100%), but there is room for improvement among the elderly (64%). Korea is above OECD average for some types of usage such as news reading and content creation, but could improve regarding more sophisticated online activities by individuals such as cloud computing and job search. Likewise, although close to 100% of firms in Korea have a broadband connection, firms' use of more advanced and productivity-enhancing technologies such as customer relationship management, cloud computing and big data analysis has significant potential to increase. The government, as an ICT user itself, is exemplary in its provision of access to openly available government data. Better data is needed on essential skills to empower people in a digital world.

Digital security and privacy risk management remain paramount to increase trust. Efforts by Korea's businesses to implement digital security measures such as information security products and services or secure servers seem to bear fruit: among OECD countries, Korea has the lowest percentage of businesses (4%) experiencing digital security incidents. Nevertheless, individuals are still facing significant digital privacy risks, despite a 10 percentage point decrease in the share of individuals having experienced privacy violations. These improvements might partly be due to several policy measures to improve privacy protection, including formal policies to manage digital privacy risk in firms. More efforts to better manage digital security and privacy risks could further contribute to improving trust and increasing sophisticated ICT usage among individuals as well as usage of advanced digital tools by firms.

"Korea has a world class position in the digital economy, but as we embark on the next phase of the digital transformation, what worked well in 2015 may not be sufficient going forward. The biggest future challenge will not be the technology but public policies that are well suited for the digital era.”

Andrew Wyckoff, OECD, Director for Science, Technology and Innovation
The ICT sector is a resilient pillar of Korea's economy with the largest share of both value added and employment across the OECD

The ICT sector is a resilient pillar of the Korean economy. It accounts for 10.4% of value added, which is by far the largest share across the OECD (Figure 1). Across the OECD, value added in the ICT sector has remained constant since the global economic crisis, in line with total value added. However, more nuances can be observed in ICT subsectors: between 2008 and 2015, value added decreased in telecommunication services (-10%) and computer and electronics manufacturing (-7%) and increased in IT services (16%) and in software (12%) (OECD, 2017a). In contrast, in Korea, the ICT manufacturing industry saw largely positive growth in 2016 (OECD, 2017b), while growth in ICT services is more mixed with low growth in telecommunications but higher growth in computer and other related services as well as in data processing and other information services (OECD, 2017c).

Figure 1. Value added of the ICT sector and sub-sectors, 2015
As a percentage of total value added at current prices

Notes: The ICT sector is defined here as the sum of industries ISIC rev.4: 26 Computer, electronic and optical products (“ICT manufacturing” in the legend); 582 Software publishing; 61 Telecommunications; and 62-63 IT and other information services. Data for Germany, Latvia, Poland, Portugal, Spain and Switzerland are for 2014. Data for Canada and Korea are for 2013. Data on software publishing were not available for Hungary, Iceland, Ireland, Japan, Korea, Luxembourg and Turkey; therefore their share could be underestimated. 2015 data on software publishing are estimates based on weights from 2014. In Switzerland, data for category 26 Computer, electronic and optical products were estimated to correct the effect of the watches industry; therefore the ICT sector share is not fully comparable with the rest of countries as it was calculated according to the OECD definition of the ICT sector. Data for Japan and the United States were partially estimated based on official data by industry. The OECD aggregate is calculated as the sum of value added in current US dollars over all countries for which data were available. IT = information technology; ICT = information and communication technology. For Korea, the three shades of red refer to ICT manufacturing (dark), Telecommunications (medium), IT and other information services (light).

Between 2008 and 2015, employment in the ICT sector across the OECD proved resilient and grew faster than total employment (OECD, 2017d). Employment in the Korean ICT sector grew by 6% over the same period; in 2015, it accounted for 4.6% of total employment (OECD, 2017e). The largest share of employment in Korea’s ICT sector is in ICT manufacturing (52%), followed by software publishing (20%) and IT and other information services (17%) (Figure 2).
Notes: The ICT sector is defined here as the sum of industries ISIC rev.4: 26 Computer, electronic and optical products (“ICT manufacturing” in the legend); 582 Software publishing; 61 Telecommunications; and 62-63 IT and other information services. Data for Germany, France, Latvia, Lithuania, Portugal, Spain, Sweden and Switzerland are 2014. 2015 data on software publishing are estimates based on weights from 2014. The OECD aggregate is calculated as the sum of persons employed over all countries for which data were available. IT = information technology; ICT = information and communication technology.


Korea’s ICT sector is also a key driver of innovation and exports

The ICT sector is a key driver of innovation in Korea. Business expenditure on research and development (BERD) intensity in Korea is 3.3% of GDP, which is the second highest share among OECD countries after Israel and before Japan (Figure 3). Within total BERD, Korea has the highest share of ICT sector BERD across the OECD, with 49% of BERD in ICT manufacturing and 8% in ICT services. Korea also has a high proportion of researchers in the ICT sector as a share of all researchers; however, this share decreased by 10% between 2009 and 2015 (OECD, 2017f). Finally, Korea is among the few OECD countries in which venture capital investments since 2009 have grown back to above the level of 2007 (OECD, 2017g).

While R&D provides one measure of innovation input, patents and registered designs capture some elements of innovation output. Among OECD countries, Korea has the highest share of patents in ICT as a percentage of total IP5 patent families despite a slight decrease between the periods 2002-05 and 2012-15 (Figure 4). Focus areas with the highest patenting activity in Korea are information and communication devices (32% of ICT-related patents) and other ICT-related technologies (19% of ICT-related patents). The United States and Korea are also the most active economies in ICT and audiovisual-related European Registered Community Designs (RCD). RCD can be used to proxy innovation in relation to the aesthetic feature of products and provide information about product differentiation and customisation. In 2011-14, both countries gained shares with respect to 2006-09 (OECD, 2017h).
Figure 3. ICT and total business expenditure on R&D intensities, 2015
As a percentage of GDP

Notes: The ICT sector is defined as the sum of “ICT manufacturing” and “ICT services”, which comprises “ICT trade industries”, “Software publishing”, “Telecommunications” and “IT and other information services”, defined according to the OECD ICT sector definition based on ISIC Rev.4. When detailed data were not available, divisions 26, 58 and 63 were used as a proxy for ICT manufacturing, Software publishing industries and Data processing, hosting and related activities; web portals respectively. For country exceptions, see endnote1.


Figure 4. Specialisation in ICT-related patents, 2012-15
Patents in ICT as a percentage of total IPS patent families

Notes: Data refer to families of patents filed within the Five IP offices (IPS), by first filing date, according to the inventor’s residence using fractional counts. Patents in ICT are identified following a new experimental classification based on their International Patent Classification (IPC) codes. Only economies with more than 150 patent families in 2012-15 are included. Data from 2014 and 2015 are incomplete.
Korea’s strong ICT sector makes the country one of the world’s top 10 exporters of ICT goods (Figure 5). Furthermore, Korea is the only OECD country whose share of ICT goods exports continued to grow over the past years (5.5% in 2001, 6.8% in 2007 and 7.2% in 2015). Korea and Japan also have the highest ICT manufacturing content in exports (both at 11.2%) among OECD countries (OECD, 2017i). However, Korea is not among the world’s top 10 exporters of ICT services (OECD, 2017j).

Figure 5. World’s top 10 exporters of ICT goods

Notes: World is estimated adding up all declaring economies which reported ICT exports in all three years; world excludes re-imports for China and re-exports for Hong Kong, China. For country exceptions, see endnote2


High penetration of high speed fixed and mobile broadband enables strong growth in mobile data and forthcoming 5G deployment

Already in 2002, operators in Korea introduced broadband at 10 Mbps and, at the time, this was a pacesetter. Today, Korea is outperforming many OECD countries in fixed and mobile broadband networks. Korea has 40 fixed and 110 mobile broadband subscriptions per 100 inhabitants and ranks second among OECD countries for the share of fibre (74%) in fixed-line broadband, behind Japan (75%). A large share (76%) of fixed broadband subscriptions in Korea are advertised with more than 100 Mbps, which is the second highest share in the OECD behind Sweden (92%) and before Japan (67%) (Figure 6).

Korea is also among the countries with high population density where consumer offers marketed at 1 Gbps are increasingly common, particularly where there is fibre to the premises or upgraded cable broadband networks. Residential offers at 1 Gbps are most common in countries that have either strong infrastructure competition between operators or competition between retail providers using wholesale networks. Korea has widespread infrastructure competition: residential apartments can access three “fibre to the basement” providers. This means the building residents, who own the inside wiring, are in a strong position to jointly negotiate very competitive prices for connections to all residences. As a result, 1 Gbps services with unlimited data usage are available in Korea at around USD 25 per month.

High-speed mobile broadband connections are enabling more data intensive mobile usages. Mobile data usage in OECD countries has grown fast over recent years and even faster in Korea. Between 2015 and 2016, mobile data usage per mobile broadband subscription grew on average by about 37% in
OECD countries and by 46% (from 2.6 GB to 3.8 GB per month) in Korea (Figure 7). The highest growth over the same period occurred in Denmark (64%) and Finland (55%), both of which were among the top five countries in mobile data usage per mobile broadband subscription in 2016 (OECD, 2017k).

Figure 6. Fixed broadband subscriptions per 100 inhabitants, per speed tiers, December 2016

![Fixed broadband subscriptions per 100 inhabitants, per speed tiers, December 2016](image)

Notes: In Korea, 96.2% of subscriptions have a speed above 50 Mbps. Mbps = megabits per second; kbps = kilobits per second. For Korea, the two shades of red refer to >1.5/2 Mbps (dark) and >100 Mbps (light).


Figure 7. Mobile data usage per mobile broadband subscription, 2016

![Mobile data usage per mobile broadband subscription, 2016](image)

Gigabytes per month

Given the current performance of broadband networks and markets in Korea it does not come as a surprise that investment in telecommunications is low (OECD, 2017l). Countries such as Korea, Latvia and Japan, which have the highest penetration of fibre in fixed networks and well-developed mobile broadband coverage, are devoting a lower relative proportion of revenue to investment. In countries with low investment in telecommunications, the next increase to overall investment is likely to be the result of forthcoming 5G mobile networks. Korea can be expected to lead on 5G developments with a test of 5G deployment at the 2018 winter Olympics in PyeongChang (Mobileworldlive, 2016).

Korean individuals’ Internet usage is high but potential remains for more sophisticated online activities

100% of the young (aged 16-24) and 64% of the elderly (aged 55-74) are using the Internet. The difference between age groups is more pronounced when taking into account educational attainment, which hardly affects the young’s Internet usage, but significantly affects that of the elderly, of whom only 45% with low educational attainment are using the Internet compared to 96% with high educational attainment.

On average 90% of all individuals are using the Internet and their usage exceeds the OECD average for news reading and content creation. Other, more sophisticated usages such as e-mail, cloud computing and job search could be higher (Figure 8). The percentage of individuals using online courses is slightly higher in Korea (13%) than in the OECD on average (10%) (OECD, 2017m).

Figure 8. Diffusion of selected online activities among Internet users, 2016
As a percentage of Internet users performing each activity

Notes: Data include the 35 OECD countries, Brazil, Colombia and Lithuania. Unless otherwise indicated, a recall period of three months is used for Internet users. For the Job Search category, data refer to 2015 (see note 6 at the end of the chapter for country exceptions). For the Software Download category, data refer to 2015 (see note 6 at the end of the chapter for country exceptions). For Online purchases and Travel and accommodation, the recall period is 12 months instead of 3 months and data relate to individuals who used the Internet in the last 12 months instead of the last 3 months. For country exceptions, see endnote5.

Likewise, firms are well connected but greater use of sophisticated ICT tools could improve productivity

Firms in Korea commonly use basic ICTs, but lag behind on more sophisticated usage. Close to 100% of firms in Korea have a broadband connection, including small and medium enterprises. However, fewer firms in Korea than in the OECD on average have a website, and more sophisticated use of ICTs, such as e-purchases and sales, are below OECD average as well. Most notably, firms’ use of productivity-enhancing technologies such as customer relationship management, cloud computing and big data analysis, has significant potential to increase (Figure 9).

Figure 9. Diffusion of selected ICT tools and activities in enterprises, 2016
As a percentage of enterprises with ten or more employees

Notes: Broadband includes both fixed and mobile connections with an advertised download rate of at least 256 kilobits per second. E-purchases and e-sales refer to the purchase and sales of goods or services conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders (i.e. web pages, extranet or electronic data interchange [EDI], but not orders by telephone, fax or manually typed e-mails). Payment and delivery methods are not considered. Enterprise resource planning (ERP) systems are software-based tools that can integrate the management of internal and external information flows, from material and human resources to finance, accounting and customer relations. Here, only sharing of information within the firm is considered. Data for ERP relate to the year 2015. Cloud computing refers to ICT services used over the internet as a set of computing resources to access software, computing power, storage capacity and so on. Customer relationship management (CRM) software is a software package used for managing a company’s interactions with customers, clients, sales prospects, partners, employees and suppliers. Data for CRM relate to the year 2015. Social media refers to applications based on Internet technology or communication platforms for connecting, creating and exchanging content on line with customers, suppliers or partners, or within the enterprise. Radio frequency identification (RFID) is a technology that enables contactless transmission of information via radio waves. RFID can be used for a wide range of purposes, including personal identification or access control, logistics, retail trade and process monitoring in manufacturing. Data for RFID relate to the year 2014. Unless otherwise stated, only enterprises with ten or more employees are considered. For country exceptions, see endnote 4.


On the other hand, Korea ranks third among the top ten countries with the highest number of operational industrial robots, before Germany and following Japan and the United States (Figure 10). In 2014, a large share of industrial robots was concentrated in a few countries: the top 5 countries alone accounted for over 80% of the total number of operational robots in the OECD. In 2015, Korea had the world’s highest robot density in the manufacturing industry with 531 multipurpose industrial robots (all types) per 10 000 employees (IFR, 2016).
Korea is making good progress towards digital government

Several Nordic European countries are leading the way in the use of e-government services, with over 80% of individuals visiting or interacting with public authorities’ websites in the four best ranking countries (OECD, 2017n). While no Korean data is available for this indicator, Korea counts among the few OECD countries with “one-stop” government websites in multiple languages. Korea is also among the OECD countries that have implemented an online tax declaration, including value-added tax (VAT), customs declaration, and online public procurement (OECD, 2017o).

Notes: “Data availability” and “data accessibility” are two out of three dimensions of the composite OECD OURdata index, which also includes “government support to the re-use” of data. For more details see endnote5

The increasing use of digital technologies by governments has driven an evolution from e-government to digital government in the OECD. Digital government refers to the use of digital technologies to create public value (OECD, 2017o). One way for governments to create public value with digital tools is through making open government data (OGD) available and accessible online. Korea is leading among OECD countries on OGD availability and accessibility (Figure 11).

**Better data is needed to assess Korea's potential skills needs in the digital economy**

With growing intensity of ICTs usage, individuals require new skills along three lines - ICT specialists, generic ICT skills, and ICT complementary skills - in order to thrive in a digital economy and to be empowered in a digital world. Few comparable data are available so far on the demand and supply of these skills in Korea, but available data show that Korea has a comparatively low share of tertiary graduates in Information and Communication Technologies (2.1%), below the OECD average (3.5%) (Figure 12). Better data is needed to make a more comprehensive assessment of potential skills needs in Korea.

**Figure 12.** Tertiary graduates in Information and Communication Technologies, 2015

As a percentage of all tertiary graduates

![Graph showing tertiary graduates in Information and Communication Technologies, 2015](image)

*Notes: Graduate at the tertiary level comprise individuals that have obtained a degree at ISCED-11 Levels 5-8. For country exceptions and more information on Korea, see endnote 6.*


**Businesses are active implementing digital security measures**

Among the OECD countries for which data is available Korea has the lowest share of enterprises experiencing security incidents (4%) (OECD, 2017p). Firms in Korea are actively implementing security measures and the Korean government promotes digital security risk awareness in SMEs by providing tax incentives for companies that invest in digital security products (OECD, 2017o). A 2016 survey revealed that 90% of businesses use information security products and 41% use information security services, up by 4% and 16% respectively compared to the previous year (MSIP and KISA, 2016). Regarding the hosting of secure servers (excluding secure mail servers, intranet and non-public extranet sites), in March 2017, Korea ranked highest among OECD countries in the share of secure servers over the total number of servers hosted. However, the United States accounts for the largest total...
number of secure servers (6.2 million), at 38% of the world total, followed by Germany (1.7 million) and the United Kingdom (0.95 million) (Figure 13).

Despite improvements over the past years, digital privacy risks remain a concern for individuals

While the share of individuals who experienced privacy violations in Korea has decreased by 10 percentage points between 2015 and 2010, it was still high at 7% in 2015 compared to other OECD countries (Figure 14).
Notes: Data for Chile, Mexico and Switzerland refer to 2014. Data for Iceland refer to 2010. Chile, Korea, Mexico and Switzerland follow a different methodology. For Korea, the Reference period is 1 year (not 3 months).


Several developments that aim to improve digital privacy risk management and personal data protection might contribute to the declining number of individuals having experienced privacy violations. For example, in 2015, over 40% of all firms and 80% of large firms had a formal policy in place to manage digital privacy risks, which is the highest share among OECD available countries (Figure 15).

Figure 15. Enterprises having a formal policy to manage digital privacy risks, 2015
As a percentage of all enterprises in each employment size class

Notes: For New Zealand data refer to 2016; for Korea to 2014; for Iceland, Lithuania and Turkey to 2010. Data for Switzerland follow a different methodology.

This good performance could be linked to incentives provided by the Korean Communications Commission (KCC): businesses that obtain a Privacy Certification benefit from reduced fines or postponed sanctions when they face a privacy violation investigation due to a personal data breach. In addition, the Law on Promotion of Information and Communications Network Utilisation and Information Protection empowers the KCC to recommend a provider of information and communications services violating this Act with respect to the protection of personal information to take disciplinary action against the responsible person (including its representative and responsible executive officers) (NLIC, 2016). Korea has also applied to the APEC Cross-border Privacy Rules System (CBPRs), a third-party certification mechanism of an organisation’s privacy protection policies and practices, which is based on the OECD Privacy Guidelines. As of June 2017, Canada, Japan, Mexico and the United States had joined the CBPRs.

Despite progress, it should be noted that concerns about digital security and privacy can restrain ICT adoption (OECD, 2017). With growing intensity of ICT use, businesses and individuals face greater digital security and privacy risks. The untapped potential in Korea for further ICT adoption and use among individuals might partly be linked to concerns about digital risks. SMEs in particular need to introduce or improve digital security risk management practices. Many OECD countries are responding to this need with national digital security strategies, but few have a national privacy strategy so far.
Notes

1. For Canada, Denmark, Finland, Hungary, Israel, Italy, the Netherlands, Poland, Portugal, Romania, Slovenia, the United Kingdom and the United States, data refer to 2014. For Austria, Belgium, France, Ireland, New Zealand, Singapore and Sweden, data refer to 2013. For Australia, data refer to 2011. GDP = gross domestic product; BERD = business expenditure on research and development; ICT = information and communication technology; China = the People’s Republic of China.

2. China’s ICT exports are adjusted for re-exports. 2016 data for China and the Netherlands are estimates based on reported values in 2015.

3. For countries in the European Statistical System and Mexico, data refer to 2016.

For Australia and New Zealand, data referring to the year 200N relate to original data from 200N/N+1 (fiscal year ending 30 June 200N+1).

For Brazil, Colombia, Chile, Israel, Japan, Korea and the United States, data refer to 2015 and for Iceland and Switzerland, to 2014. For Canada and New Zealand, data refer to 2012.

For Canada and Japan, the recall period is 12 months. For the United States, no time period is specified.

For the job search category, data refer to 2012 for Canada and Japan; to 2013 for Iceland; to 2015 for Brazil, Chile, Korea and the United States; and to 2016 for Mexico.

For the software download category, data refer to 2016 for Mexico.

For online purchases, the recall period is three months for Australia, and data relate to individuals who used the Internet in the last three months for Australia, Israel and the United States.

For travel and accommodation, data relate to individuals who used the Internet in the last three months for Australia and Mexico. For Mexico, it refers to the following category: “reservations and tickets”.

For Australia, data refer to 2014, except for email (2010). The reference period is the last 3 months in 2014 and the last 12 months in the previous years.

For Israel, data refer to individuals aged 20 and over instead of 16-74.

For Japan, data refer to individuals aged 15-69 instead those aged 16-74. For job search, data refer to 2012 and for online sales, to 2010.

For Mexico, “content creation” relates to “create or visit blogs”, “telephone” to “Internet telephone conversations (VoIP)”, and “product information” includes the category “Individuals using the Internet for seeking health related information”.

4. Broadband: for Australia, includes “DSL”, “fibre to the premises”, “cable”, “fixed wireless”, “mobile wireless”, “satellite” and “other”. For Canada, includes all connection groups except dial-up connection.

E-purchases: for Australia, data refer to the proportion of businesses placing/receiving orders over computer networks by methods specifically designed for the purpose (includes web pages, extranet or EDI). It includes any transaction where the commitment to purchase was made via the Internet, including via e-mail. For New Zealand, data exclude orders initiated via EDI-type messages. For Switzerland, data refer to the share of enterprises buying or selling and no recall period mentioned in the question.
E-sales: for Australia, data refer to the proportion of businesses placing/receiving orders over computer networks by methods specifically designed for the purpose (includes web pages, extranet or EDI). This includes any transaction where the commitment to purchase was made via the Internet.

ERP: for Canada, data relate to the year 2013, and for Iceland and Sweden to 2014.

Cloud computing: for Canada, data relate to the year 2012, and to enterprises that have made expenditures on “software as a service (e.g. cloud computing)”.

RFID: for Japan, Korea and Switzerland, data relate to the year 2015; for Canada data relate to 2013 and for Turkey to 2011.

For countries in the European Statistical System, sector coverage consists of all activities in manufacturing and non-financial market services, and data on e-purchases and e-sales refer to 2015. For Australia and New Zealand, data refer respectively to the fiscal year 2014/15 and the fiscal year 2015/16, ending 30 June, instead of 2016. For industrial classification, ANZSIC06 division is used instead of ISIC Rev.4 division. For Australia, data include agriculture, forestry and fishing. For Canada, the North American Industry Classification System (NAICS) is used instead of ISIC Rev.4, and data refer to 2013 except cloud computing (2012). For Iceland, data refer to the year 2014. For Japan, Korea and Switzerland, data refer to the year 2015. For Japan, JSIC Rev.13 division is used instead of ISIC Rev.4 and data include total businesses with 100 or more employees instead of 10 and more. For Mexico, data refer to the year 2012. For Switzerland, data refer to the year 2015, website data refer to 2011 instead of 2016, and data for 2015 refer to firms with five or more employees. For Switzerland, data for the year 2015 relate to businesses with five or more employees instead of ten or more.

5. Data availability” aggregates information on the content of the open by default policy, stakeholder engagement for the prioritisation of data release, and the availability of strategic open government data on national portals (e.g. national election results, national public expenditures, the most recent national census). “Data accessibility” aggregates information on the availability of formal requirements, and the implementation of these, in regard to the publication of open government data with an open licence, in open formats (e.g. non-proprietary) and accompanied with the descriptive metadata, as well as on stakeholder engagement for data quality. The data come from the OECD Survey on Open Government Data conducted in November and December 2016. Survey respondents were predominantly chief information officers in OECD countries. Responses represent countries’ own assessments of current practices and procedures regarding open government data. Data refer only to central/federal governments and exclude open government data practices at the state/local levels.

6. In Korea, the Information and Communication Technology major is a sub-category of the Computer and Communication major. Computer and Communication includes additional majors in two other sub-categories: Computer Science & Computer Engineering, and Applied Software Engineering.

For the Netherlands, data exclude doctoral graduates. For Japan, data are not available because Information and communication technologies are included in other fields of study.
References


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