



# International Digital Economy and Society Index 2018

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## ***Abstract***

The International Digital Economy and Society Index (I-DESI) mirrors and extends the EU28 Digital Economy and Society Index by utilising 24 datasets to enable trend analysis and comparison of the digital performance of 45 countries.

Analysis showed that EU28 Member States compare well with 17 non-EU countries and the very best EU28 countries have digital performances at the same or higher levels than the best global countries. Indeed Denmark was the leading country in the I-DESI index. EU28 Member States perform best, relative to the 17 non-EU countries, in the Connectivity dimension (examining the deployment and take-up of fixed and mobile broadband) and in the Citizen Use of the Internet dimension.



## *Résumé*

L'indice international relatif à l'économie et à la société numériques (I-DESI) reflète et étend l'indice relatif à l'économie et à la société numériques des 28 pays de l'Union Européenne en utilisant 24 ensembles de données permettant l'analyse des tendances et la comparaison de la performance numérique de 45 pays.

Les analyses ont montré que les 28 États membres de l'Union Européenne se comparent favorablement aux 17 pays hors UE et que les meilleurs pays de l'UE présentent des niveaux de performances numériques égaux ou supérieurs aux meilleurs pays dans le monde. En effet, le Danemark est le pays qui arrivait en tête de l'indice I-DESI. Les 28 États membres de l'UE présentent les meilleures performances, comparativement aux 17 pays hors UE, pour l'indicateur sur la Connectivité (qui examine le déploiement et l'adoption du haut débit fixe et mobile) et l'indicateur portant sur l'Utilisation d'Internet par les citoyens.

## Executive Summary

The International Digital Economy and Society Index (I-DESI) measures the digital economy performance of EU28 Member States and the EU as a whole in comparison with 17 other countries around the world (Australia, Brazil, Canada, Chile, China, Iceland, Israel, Japan, Mexico, New Zealand, Norway, Russia, Serbia, South Korea, Switzerland, Turkey and the United States). The I-DESI aims to mirror and extend the results of the European Commission's Digital Economy and Society Index (DESI) by finding indicators that measure similar variables for non-EU countries. The DESI is a composite index that benchmarks relevant indicators on digital performance and tracks the evolution of the EU as a whole and its member states in digital competitiveness. I-DESI combines 24 indicators and uses a weighting system to rank each country based on its digital performance with the aim to benchmarking the development of the digital economy and society.

The 2018 I-DESI utilises datasets over a four year time period from 2013 to 2016 to provide trend analysis. It brings together a set of relevant indicators similar to the current EU28 DESI digital policy mix. Coverage of suitable datasets in more developed countries, which provide a reasonable peer group for comparison with EU28 Member States, are relatively good. Careful selection of variables has ensured that coverage beyond the non-EU 17 countries included in this study is relatively good, but not quite at the robust level suitable for analysis in a European Commission study.

This study has selected 24 indicators in five different dimensions and brought them together to provide a single overview. While the numbers have little meaning in themselves, the comparative figures are where the story really lies. Comparisons enable the identification of gaps between the performance and capabilities of the 45 countries studied (28 Member States and 17 non-EU countries). Importantly this international study enables the comparison of EU28 digital performance with a peer group of 17 countries from around the globe. I-DESI will help countries to identify areas requiring investments and action to reach the levels of the best performing global countries.

Correlations and covariance testing of indicators, sub-dimensions and dimensions were undertaken to examine how closely the I-DESI matches the DESI data for 2013 to 2016 against the five key dimensions examined by the study. The level of correlation was good, a correlation score<sup>1</sup> of 0.94 was recorded between I-DESI and DESI scores and country rankings. Comparisons between the two studies can therefore be undertaken with a relatively high degree of confidence.

The main methods stipulated for analysis included comparison of the average performance of EU28 Member States and the performance of the leading four and bottom four Member States from each group with a specified representative group of four non-EU countries (China, Japan, South Korea and USA). Comparisons were undertaken against the five dimensions developed by DESI. These are:

1. **Connectivity:** The deployment of broadband infrastructure and its quality;
2. **Digital skills:** The skills needed to take advantage of the possibilities offered by a digital society;

3. **Citizen use of Internet:** The variety of activities performed by citizens already online;
4. **Business technology integration:** The digitisation of businesses and development of the online sales channel;
5. **Digital public services:** The digitisation of public services, focusing on eGovernment.

Analysis showed that EU28 Member States compare well with the 17 non-EU countries and the very best EU28 countries are at the same or a higher level than the best global countries. Indeed Denmark was the leading country in the **I-DESI index**. Denmark was also the leading country in the EU28 DESI<sup>2</sup>. The leading non-EU country, which came second of all 45 countries studied, was South Korea. In third place was Finland, which was the second best performing EU28 Member State in the EU28 DESI. EU28 Member States filled six of the top ten positions for the main I-DESI index.

The **Connectivity dimension** - examining the deployment and take-up of fixed and mobile broadband - is the area where the EU28 average compares well with non-EU countries. The strongest areas in this dimension for EU28 Member States are the broadband coverage and take-up sub-dimension and broadband prices.

EU28 Member States also generally performed better than their 17 global counterparts in the **Citizen Use of the Internet dimension**. EU28 Member States do not significantly out-perform their global counterparts in any of the sub-dimensions, but they are consistently just ahead of them.

The Digital Single Market Strategy has several economic objectives, including job creation and economic growth. The **Business Technology Integration dimension** looked specifically at the digitisation of businesses. In 2016 the average EU28 Member State performance for this dimension drew level with non-EU countries for the first time since 2013.

**Public Services** is the one dimension where EU28 Member States have consistently performed below their 17 non-EU counterparts.

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<sup>2</sup> Comparison is with the 2017 I-DESI which, like this study, examined 2016 EU28 Member State data.

## Sommaire Exécutif

L'indice international relatif à l'économie et à la société numérique (I-DESI) mesure la performance de l'économie numérique des 28 états membres de l'Union Européenne et de l'UE dans son ensemble en comparaison avec 17 autres pays dans le monde (Australie, Brésil, Canada, Chili, Chine, Islande, Israël, Japon, Mexique, Nouvelle-Zélande, Norvège, Russie, Serbie, Corée du Sud, Suisse, Turquie et les États-Unis). Le I-DESI vise à refléter et à étendre les résultats de l'indice relatif à l'économie et à la société numérique de l'Union Européenne (DESI) en trouvant des indicateurs qui mesurent des variables similaires pour les pays non membres de l'Union Européenne. Le DESI est un indice composite qui évalue les indicateurs pertinents relatifs à la performance numérique et suit l'évolution de l'UE dans son ensemble; ainsi que ses états membres; en termes de compétitivité numérique. Le I-DESI combine 24 indicateurs et utilise un système de pondération pour classer chaque pays en fonction de sa performance numérique, dans le but d'évaluer le développement de l'économie et de la société numérique.

Le I-DESI 2018 utilise un ensemble de données sur une période de quatre ans, de 2013 à 2016, pour fournir une analyse des tendances. Il rassemble des indicateurs pertinents semblables à la panoplie de mesures numériques actuelles du DESI de l'UE à 28. Le champ d'application des ensembles de données appropriées dans des pays plus développés, qui fournit un groupe de pairs satisfaisant aux fins de la comparaison aux 28 états membres de l'UE, est relativement bon. Une sélection rigoureuse des variables a permis de garantir un champ d'application relativement bon au-delà des 17 pays non membres de l'UE, mais pas à un niveau suffisamment fiable pour convenir à l'analyse dans le cadre d'une étude de la Commission Européenne.

Cette étude a sélectionné 24 indicateurs dans cinq dimensions différentes et les a rassemblés pour fournir une seule vue d'ensemble. Bien que les chiffres soient peu significatifs en eux-mêmes, c'est dans les données comparatives que tout se joue réellement. Les comparaisons permettent d'identifier les fossés entre la performance et les capacités des 45 pays étudiés (28 états membres et 17 pays non membres). Mais surtout, cette étude internationale permet de comparer la performance numérique des 28 pays de l'UE avec un groupe de pairs composé de 17 pays du monde entier. Le I-DESI va aider les pays à identifier les domaines dans lesquels des investissements et des efforts sont nécessaires pour atteindre les niveaux des pays les plus performants au monde.

Des tests de corrélation et de covariance sur les indicateurs, les sous-dimensions et les dimensions ont été effectués pour examiner le niveau d'adéquation du I-DESI aux données du DESI pour les années 2013 à 2016 par rapport aux cinq dimensions clés examinées par l'étude. Le niveau de corrélation s'est avéré bon, avec un taux de corrélation <sup>3</sup> de 0,94 enregistré entre les résultats du I-DESI et du DESI et les classements des pays. Les comparaisons entre les deux études peuvent donc être effectuées avec un degré de confiance relativement élevé.

Les méthodes principales stipulées pour l'analyse comprenaient la comparaison de la performance moyenne des 28 états membres de l'UE et de la performance des quatre premiers et des quatre derniers états membres de chaque groupe avec un groupe représentatif spécifique de quatre pays non membres de l'UE (Chine, Japon,

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<sup>3</sup> Un score de 1 indique une 'correspondance parfaite', un score de zéro indique qu'il n'y a aucune corrélation.



Corée du Sud et États-Unis). Les comparaisons ont été effectuées par rapport aux cinq dimensions élaborées par le DESI. Celles-ci sont :

1. **La connectivité** : Le déploiement de l'infrastructure haut débit et sa qualité;
2. **Les compétences numériques** : Les compétences requises pour tirer pleinement profit des possibilités offertes par une société numérique;
3. **L'utilisation d'Internet par les citoyens** : La variété des activités entreprises par les citoyens qui sont déjà en ligne;
4. **L'intégration technologique des entreprises** : La numérisation des entreprises et le développement des canaux de vente en ligne;
5. **Les services publics numériques** : La numérisation des services publics, avec l'accent sur l'administration en ligne (e-Gouvernement).

Les analyses ont montré que les 28 États membres de l'Union Européenne se comparent favorablement aux 17 pays non membres et que les meilleurs pays de l'UE présentent des niveaux de performances numériques égaux ou supérieurs aux meilleurs pays dans le monde. En effet, le Danemark est le pays qui arrivait en tête de **l'indice I-DESI**. Le Danemark est également le pays en tête dans le DESI de l'UE à 28<sup>4</sup>. Le premier pays non membre de l'UE, qui est arrivé deuxième sur la liste des 45 pays étudiés, était la Corée du Sud. En troisième place se situait la Finlande, le deuxième pays performant le mieux parmi les 28 états membres de l'UE dans le DESI de l'UE à 28. Les 28 états membres de l'UE remportent six des dix meilleures places dans l'indice principal I-DESI.

La **dimension Connectivité** - qui examine le déploiement et l'adoption du haut débit fixe et mobile - est le domaine pour lequel la moyenne de l'UE à 28 se compare favorablement avec les pays non membres de l'UE. Les secteurs les plus importants dans cette dimension pour les 28 états membres de l'UE sont la sous-dimension concernant la couverture et l'adoption du haut-débit ainsi que les prix du haut débit.

Les 28 états membres de l'UE présentent généralement une meilleure performance que leurs 17 homologues internationaux pour ce qui est de la **dimension Utilisation d'Internet par les citoyens**. Les 28 états membres de l'UE ne dépassent pas de manière significative la performance de leurs homologues internationaux dans aucune des sous-dimensions, mais ils sont systématiquement juste au-devant d'eux.

La stratégie pour un marché unique numérique a plusieurs objectifs économiques, notamment la création d'emplois et la croissance économique. La **dimension Intégration technologique de l'entreprise** étudiait en particulier la numérisation des entreprises. En 2016 la performance moyenne des 28 états membres de l'UE dans cette dimension se situait au même niveau que les pays non membres, pour la première fois depuis 2013.

Les **Services publics** est la seule dimension pour laquelle la performance des 28 états membres de l'UE a été systématiquement inférieure à leurs 17 homologues non membres de l'UE.

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<sup>4</sup> La comparaison se fait avec le I-DESI de 2017 qui, comme cette étude, a examiné les données de 2016 de 28 états membres de l'UE.

# 1. Introduction

## 1.1. Background and objectives

The Internet and digital technologies are transforming our world. The European Commission has identified that an efficiently functioning Digital Single Market could contribute €415 billion per year to our economy and create hundreds of thousands of new jobs.

The Digital Single Market strategy aims to open up digital opportunities for people and business and enhance Europe's position as a world leader in the digital economy. Connectivity targets for 2025 have been established to create a Gigabit Society<sup>5</sup> and policies are being pursued to address barriers and seize opportunities to digital adoption and development in EU28 Member States<sup>6</sup>.

Evaluation and monitoring play an important part in benchmarking performance and monitoring progress towards policy goals. Results from monitoring provide a mirror that can be held up to EU Member States so that they can clearly see themselves and other countries (within and beyond the EU28) in the same perspective.

Benchmarking usually concentrates on figures and avoids comment. This benchmarking study contains a lot of detail and data can be analysed in many ways to reveal and examine underlying differences. The objective of this study is to provide indicators for key areas of improvement and identify Member States that are succeeding. Many nations will have economic and cultural reasons for high or low scores in individual indicators. However, taking the factors overall, they do show in aggregate the performance of EU28 Member States.

This study has selected quantitative data and brought it together to provide a single overview. While the numbers individually have little meaning as quantities in themselves, the comparative figures are where the story really lies. They show gaps between the performance and capabilities of Member States. Importantly this international study enables the comparison of EU28 digital performance with a group of 17 countries from around the globe.

## 1.2. Digital Economy and Society Index (DESI)

The Digital Economy and Society Index (DESI) is a composite measure that examines Europe's digital performance. The DESI was first calculated in 2014, using statistics from 2013. It is one of the main analytical tools developed by DG CNECT to provide evidence-based input for the assessment of digital development in the EU as a whole as well as in Member States.

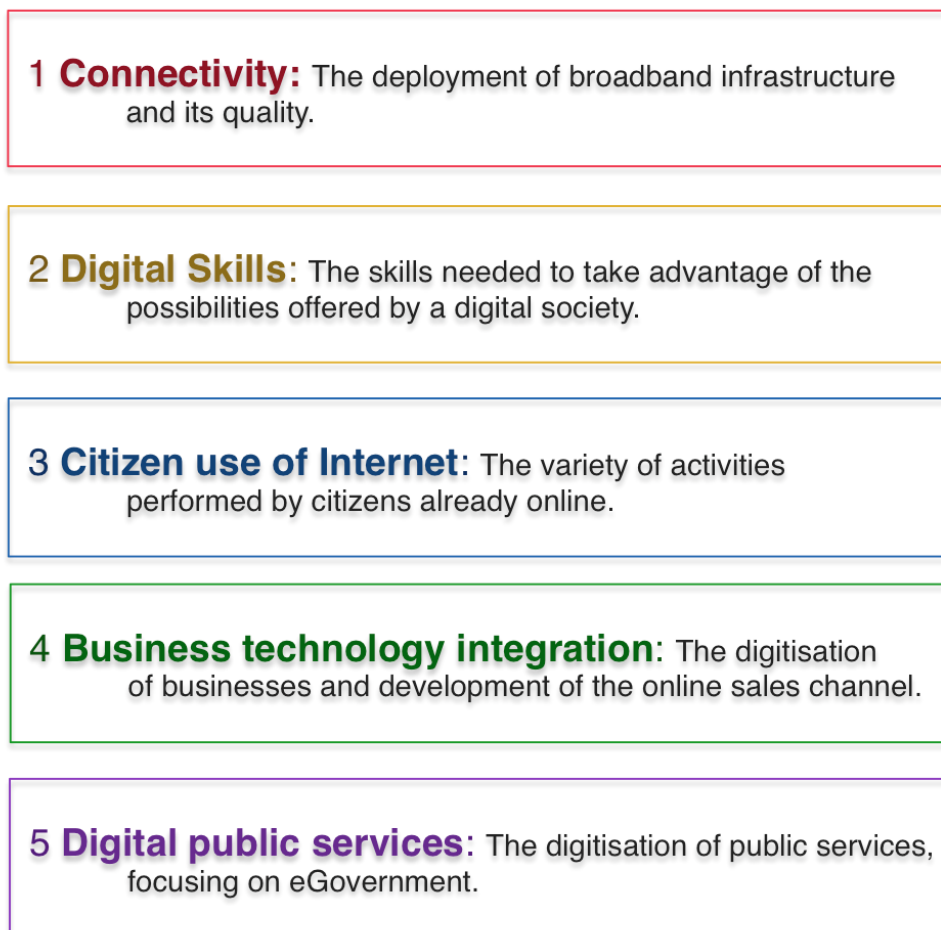
The DESI aims to help EU countries identify areas requiring priority investments and action in order to create a truly Digital Single Market.

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<sup>5</sup> European Parliament Think Tank. 2017. Towards a European Gigabit society: Connectivity targets and 5G. [http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS\\_BRI%282017%29603979](http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI%282017%29603979)

<sup>6</sup> Policies include The new European electronic communications code [http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/593562/EPRS\\_BRI\(2016\)593562\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/593562/EPRS_BRI(2016)593562_EN.pdf), The 5G Action Plan <https://ec.europa.eu/digital-single-market/en/news/communication-5g-europe-action-plan-and-accompanying-staff-working-document>, and the promotion and use of internet connectivity <https://ec.europa.eu/digital-single-market/en/news/proposed-regulation-promotion-internet-connectivity-local-communities-and-public-spaces-wifi4eu>.

DESI combines more than 30 indicators and uses a weighting system to rank each country based on its digital performance. It brings together a set of relevant indicators on Europe's current digital policy mix<sup>7</sup>. The index is divided into five main dimensions, which are in turn composed of sub-dimensions. The main dimensions are shown in Figure 1.



**Figure 1 The five dimensions of the Digital Economy and Society Index**

### **1.3. Comparability of the EU28 DESI and I-DESI**

The data included in DESI was mostly collected by the European Commission services - DG Connect and Eurostat<sup>8</sup> and by ad-hoc studies launched by the Commission services. Over a short period of time Eurostat has been able to catalyse the robust collection of digital indicator information in EU28 Member States.

In 2015 the need to take a broader global perspective was realised. The first International Digital Economy and Society Index (I-DESI), published in 2016, provided a snapshot to compare statistics from 15 non-EU countries with the performance of EU Member States.

<sup>7</sup> [http://europa.eu/rapid/press-release\\_MEMO-16-385\\_en.htm](http://europa.eu/rapid/press-release_MEMO-16-385_en.htm)

<sup>8</sup> Supported by national statistical offices.

Organisations such as the International Telecommunications Union (ITU), OECD, UN, World Bank and World Economic Forum are extending their coverage of digital statistics. Private sector organisations, such as Akamai and Google, are using innovative methods and more extensive sample sizes to collect more robustly relevant digital datasets.

The 2018 I-DESI has been able to utilise datasets over a four year time period from 2013 to 2016 to provide trend analysis. But problems have still been encountered in trying to find perfect surrogates to replicate all the indicators used in the EU28 DESI. Coverage of suitable datasets in more developed countries, which provide a reasonable peer group for comparison with EU28 Member States, are relatively good<sup>9</sup>. Careful selection of variables has ensured coverage beyond the 17 countries included in this study is relatively good, but not quite at the level attainable for all the countries included in this study<sup>10</sup>.

## 1.4. Study objectives

The 2018 I-DESI has three key objectives:

1. **General performance assessment** - to obtain a characterisation of the performance of non-EU countries that mirrors DESI by calculating overall index scores and scores for the main index dimensions of a selected group of 17 non-EU countries;
2. **Comparative analysis** - to undertake comparative trend analysis over a four year time period – 2013 to 2016 - of the performance within and between a selected group of 17 non-EU countries and 28 EU Member States;
3. **Zooming-in** - to pinpoint areas where EU28 Member State performance is competitive in comparison with non-EU countries and to identify areas where performance needs to improve to better match a comparison group of 17 selected non-EU countries.

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<sup>9</sup> The 17 countries compare relatively well with EU28 Member States. Average GDP per capita of the upper quartile of EU28 Member States in 2016 was €44,650 for the non-EU countries it was €52,560. Average GDP per capita of the lowest quartile of EU28 Member States in 2016 was €10,320 for the non-EU countries it was €7,360.

<sup>10</sup> All countries included in analysis had data for 20 or more of the 24 indicators used in this study.

## 2. Results

### 2.1. Introduction

This chapter provides an overview of the results from I-DESI analysis. It first compares the aggregate performance of EU28 Member States with 17 non-EU countries across all I-DESI dimensions. The remaining sections then present results for each of the five dimensions that comprise I-DESI.

The presentation of data from 45 countries, for four years (2013 to 2016), in a single graphic would be very untidy. Instead we present the results of aggregated information for each dimension to provide comparative insights. Comparative insights required by the European Commission focused on:

- **The top four performing countries** - Performance of the leading four EU28 Member States;
- **Average** - This describes the average performance<sup>11</sup> of EU28 Member States;
- **The bottom four performing countries** - Performance of the bottom four EU28 Member States.

In addition the performance of four non-EU countries were stipulated as a reference point for comparison in all graphics. The four countries are South Korea, which came top of the non-EU I-DESI group, Japan (the 5<sup>th</sup> non-EU I-DESI country in 2016), USA (8<sup>th</sup>) and China (13<sup>th</sup>). Raw data performance scores and normalised scores for all 45 countries (EU28 and non-EU) can be found in Annex 3<sup>12</sup>.

For ease of reference, throughout this chapter blue lines in all figures refer to EU28 Member States. Red lines in graphics provide details of four non-EU countries selected for presentation in all graphics. Darker colours refer to better performing countries and lighter colours to countries performing less well.

### 2.2. The overall index

Figure 2 provides an overview of the performance scores across all dimensions for I-DESI. The leading country in the 2016 I-DESI was Denmark, with a score of 75.9. Denmark was also the leading country in the 2016 EU28 DESI<sup>13</sup>. The leading non-EU country, which came second of all 45 countries studied, was South Korea (75.2). In third place (of 45 countries) was Finland (73.8), which was the second best performing EU28 Member State in the 2016 I-DESI and 2016 DESI.

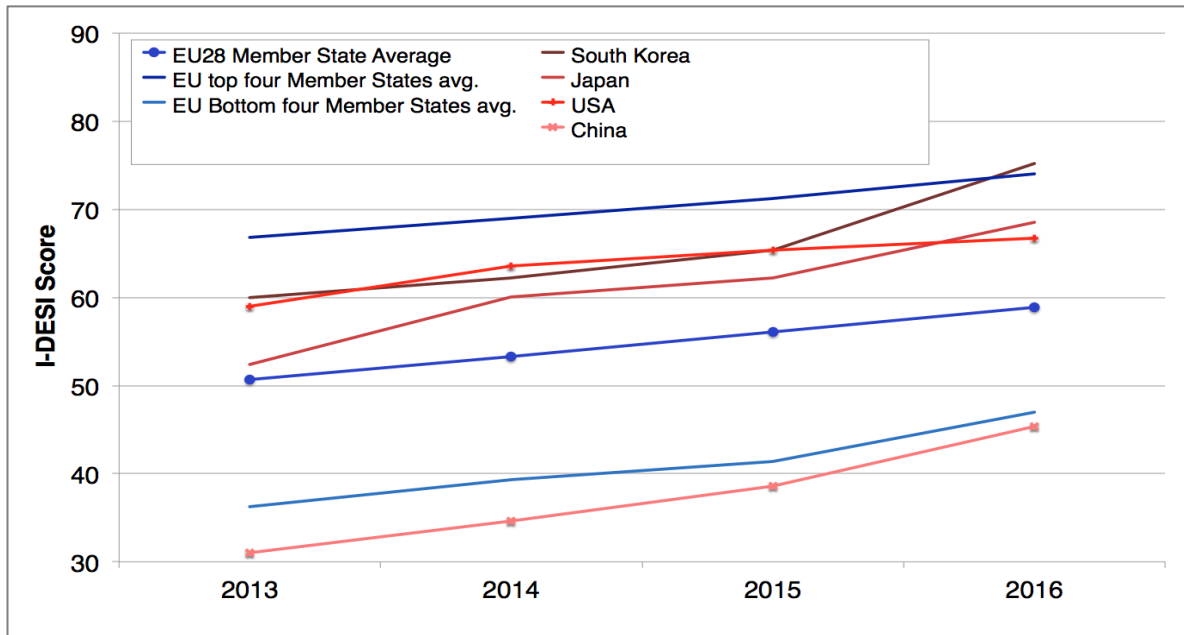
Figure 2 shows that the average performance of EU28 Member States in 2016 was 58.9. The top four EU28 Member States have consistently performed at a higher level than the four countries stipulated for comparison in Figure 2. In 2016 South Korea overtook the leading four EU Member State average for the first time.

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<sup>11</sup> Throughout analysis 'average' refers to the arithmetic mean.

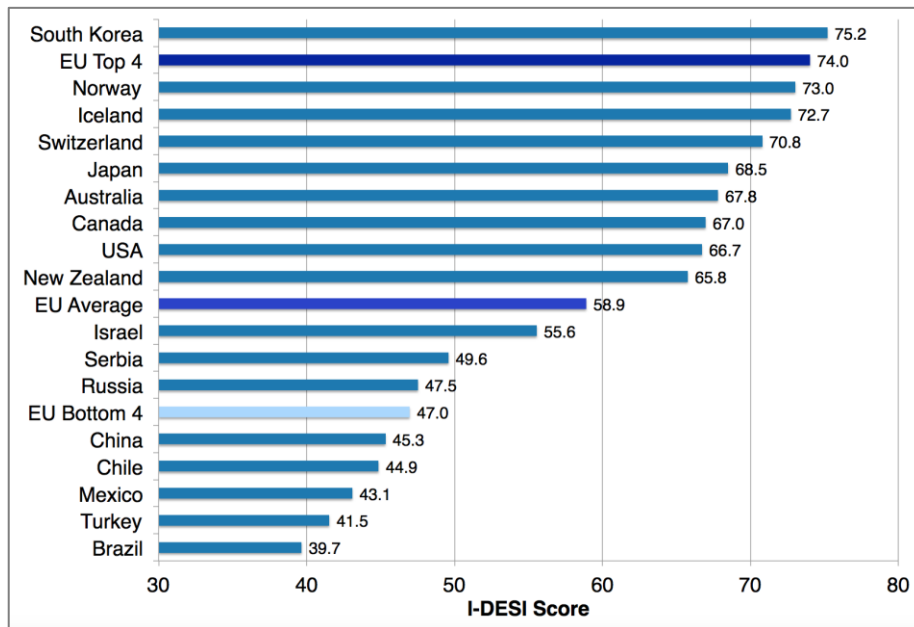
<sup>12</sup> Raw data scores are provided for all indicators except those provided by ITU. ITU data is available by subscription only and subject to copyright restrictions, therefore only normalised scores are presented. The normalisation process scaled data sets (often collected in different ways e.g. percentages, scores of 0 to 1 and scales of 1 to 7) into a range from 0 to 1. For ease of comparison these scores have been converted into a scale of 0 to 100 in this report.

<sup>13</sup> Comparison is with the 2017 I-DESI which, like this study, examined 2016 EU28 Member State data.



**Figure 2 Average scores across all dimensions for I-DESI 2013 to 2016**

As might be expected with increasing adoption and use of digital technologies there has been a steady increase in scores between 2013 and 2016. EU28 Member States on average increased by 16 per cent across the four years of the study. The largest increase in performance was recorded by Serbia, which increased its score by 75 per cent between 2013 and 2016 and rose from last place amongst the 45 countries analysed to 34<sup>th</sup> place. **Figure 3** provides scores for all non-EU countries in 2016.



**Figure 3 Non-EU countries normalised performance scores for I-DESI in 2016**

As noted previously the I-DESI is comprised of five dimensions and 24 indicators. The remainder of this chapter provides a short overview of the different dimensions, sub-dimensions and indicators.

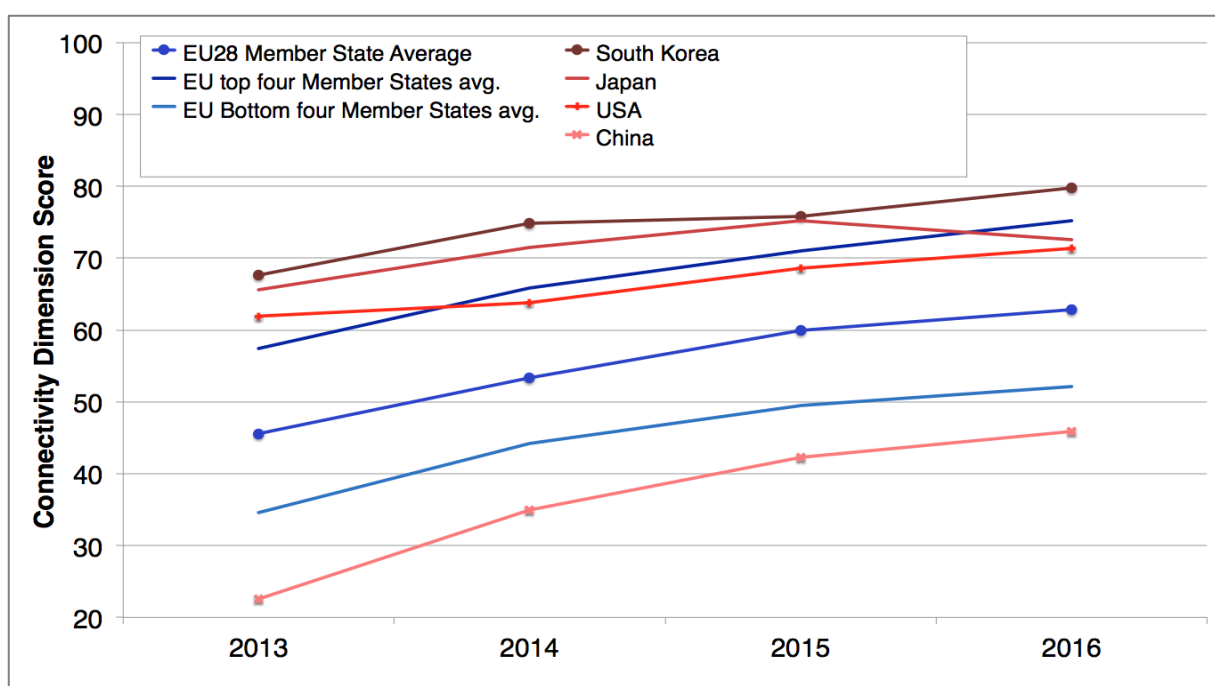
## 2.3. The Connectivity dimension

The connectivity dimension is comprised of seven indicators grouped together in four sub-dimensions that examine fixed and mobile broadband deployment and take-up.

1 Connectivity	Fixed broadband (1a)	Fixed broadband coverage (1a1)
		Fixed broadband take-up (1a2)
	Mobile broadband (1b)	Mobile broadband take-up (1b1)
		4G coverage (1b2)
	Speed (1c)	NGA coverage (1c1)
		Fast broadband take-up (1c2)
	Affordability (1d)	Fixed broadband price (1d1)

Figure 4 provides an overview of connectivity dimension performance scores for EU28 Member States and four of the 17 non-EU countries examined in this study between 2013 and 2016.

In 2016 the EU28 Member State average performance<sup>14</sup> for the connectivity dimension was 62.9. Only six of the non-EU countries (including South Korea, Japan and USA) had a higher score in 2016, see Figure 4.



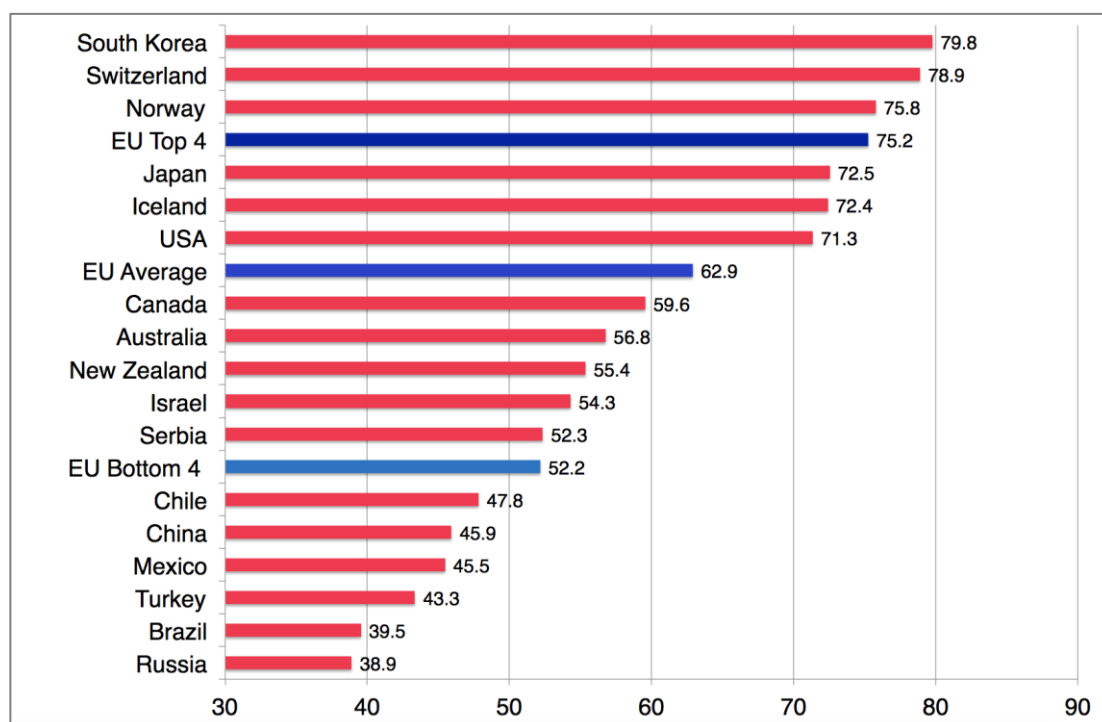
**Figure 4 Average performance scores for the connectivity dimension**

Figure 4 shows that in 2016 the average connectivity dimension score for the leading four EU28 (75.2) is behind South Korea (79.8), but ahead of Japan and the USA. The average score for the bottom four EU28 Member States (52.2) is ahead of China and five other non-EU countries<sup>15</sup>.

<sup>14</sup> Normalised and weighted score for the dimension, see chapter 3.

<sup>15</sup> An obvious characteristic of several of the bottom five non-EU countries (Brazil, China, Russia) is their large size and relatively low population densities. This will make fixed and mobile infrastructure deployment more difficult and costly.

During the four year period examined in this study the average EU28 connectivity score increased by 38 per cent from 45.6 in 2013 to 62.9 in 2016.



**Figure 5 Normalised country scores for the connectivity dimension in 2016**

Obviously countries performance in the connectivity dimension between 2013 and 2016, presented in Figure 4, is comprised of large and small changes in the sub-dimensions that comprise the connectivity dimension.

The remainder of this section examines scores and rates of change within the four sub-dimensions that comprise the connectivity dimension of I-DESI. Section 3.2 provides concise definitions of several key terms used in by this dimension, for example broadband, coverage, connectivity, take-up, subscriptions and Next Generation Access (NGA).

**a. Broadband coverage and take-up:** EU28 Member States are well ahead of their non-EU counterparts in this sub-dimension. The sub-dimension is comprised of two indicators.

The first broadband sub-dimension indicator examines **fixed broadband coverage**. In 2016 EU28 Member State average coverage was 96.8 per cent (of the population). Five of the 17 non-EU countries achieved this level of take-up (or higher) in 2016. Nine EU28 Member States claimed 100 per cent fixed broadband coverage in 2016; only two non-EU countries had this ubiquitous level of coverage.

The second indicator in this sub-dimension used ITU data to examine **subscriptions for fixed broadband**. In 2016 average fixed broadband take-up was 72 per cent in EU28 Member States. Five of the 17 non-EU countries achieved this level of take-up (or higher) in 2016.

**b. 4G coverage and mobile take-up:** In 2016 EU28 Member States were performing at a similar level to their non-EU counterparts in this sub-dimension. There has been growing use of mobile devices and increased 4G coverage throughout the world.



The first indicator for this sub-dimension is **mobile broadband take-up**. In 2016 the average number of mobiles per 100 of the population in EU28 Member States was 85.1. Ten of the 17 non-EU countries had a higher level of mobile take-up in 2016.

The second indicator for this sub-dimension examines **4G coverage**. EU28 Member States had average 4G coverage of 93.5 per cent of the population in 2016. Nine of the 17 non-EU countries had a higher level of coverage.

**c. Fast broadband coverage and take-up:** This sub-dimension is comprised of two indicators.

**NGA coverage** - EU28 Member States (average 30 per cent coverage in 2016) perform at a similar level to non-EU countries for this indicator. The top four EU28 Member States had an average level of coverage of 46 per cent in 2016. Four of the 17 non-EU countries had a higher level of coverage in the same year.

**Fast broadband take-up**, the second indicator for this sub-dimension, is relatively low across all 45 countries examined. In 2016 only three non-EU countries and three EU28 Member States had more than 20 per cent fast broadband take-up. The average level of take up in EU28 Member States is 14.2 per cent. Eight of the 17 non-EU countries had a higher level of take-up in 2016.

**d. Fixed broadband prices:** The final sub-dimension concerns the price paid for fixed broadband<sup>16</sup>. In 2016 the average normalised score for EU28 Member States was 74.3. Six of the 17 non-EU countries exceeded this normalised score.

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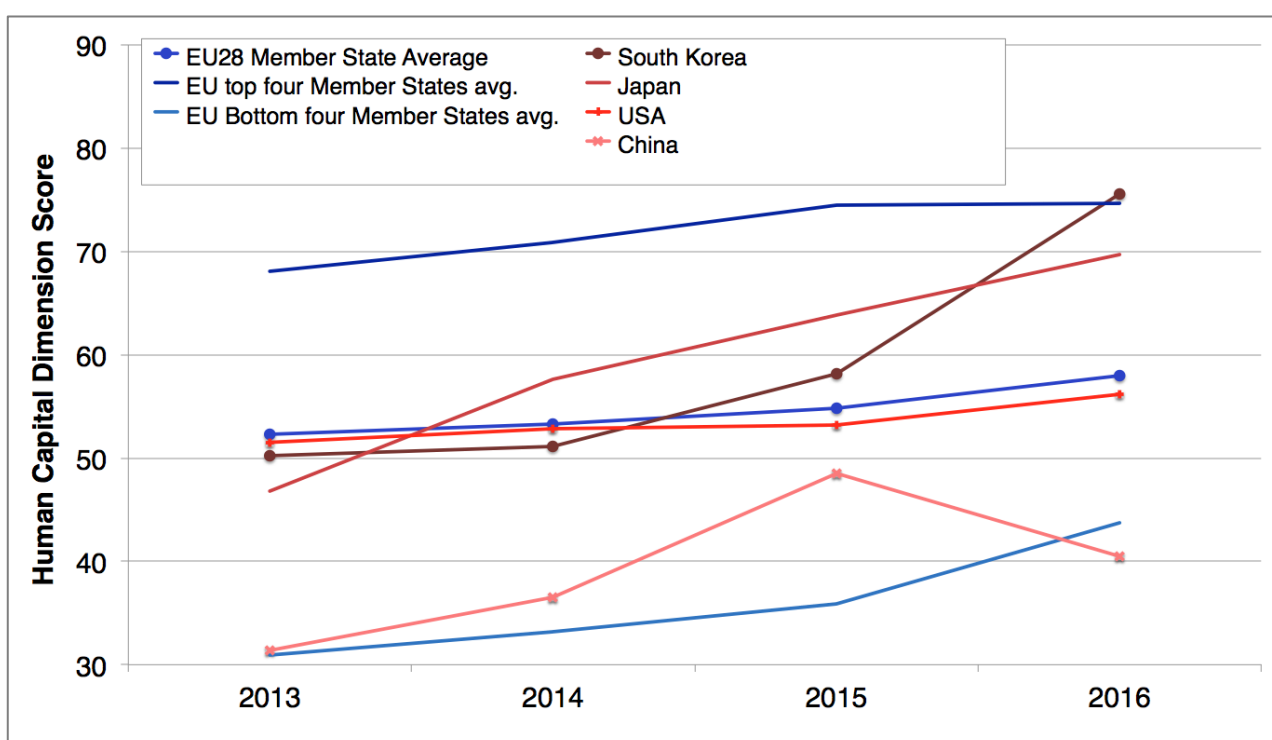
<sup>16</sup> This is the only indicator, amongst all those analysed in this study, where a reduction in the item measured for an indicator is advantageous, this is indicated with a positive increase in the score in I-DESI.

## 2.4. The Human Capital dimension

The human capital dimension is comprised of four indicators grouped together in two sub-dimensions that examine the skills needed to take advantage of the opportunities offered by a digital society.

2 Digital Skills	Basic skills and usage (2a)	Internet users (1a1)
		Regular internet users (1a2)
	Advanced skills and development (2b)	Knowledge intensive employment (1b1)
		Tertiary graduates in ICT (1b2)

Figure 6 provides an overview of the average performance score for the human capital dimension.



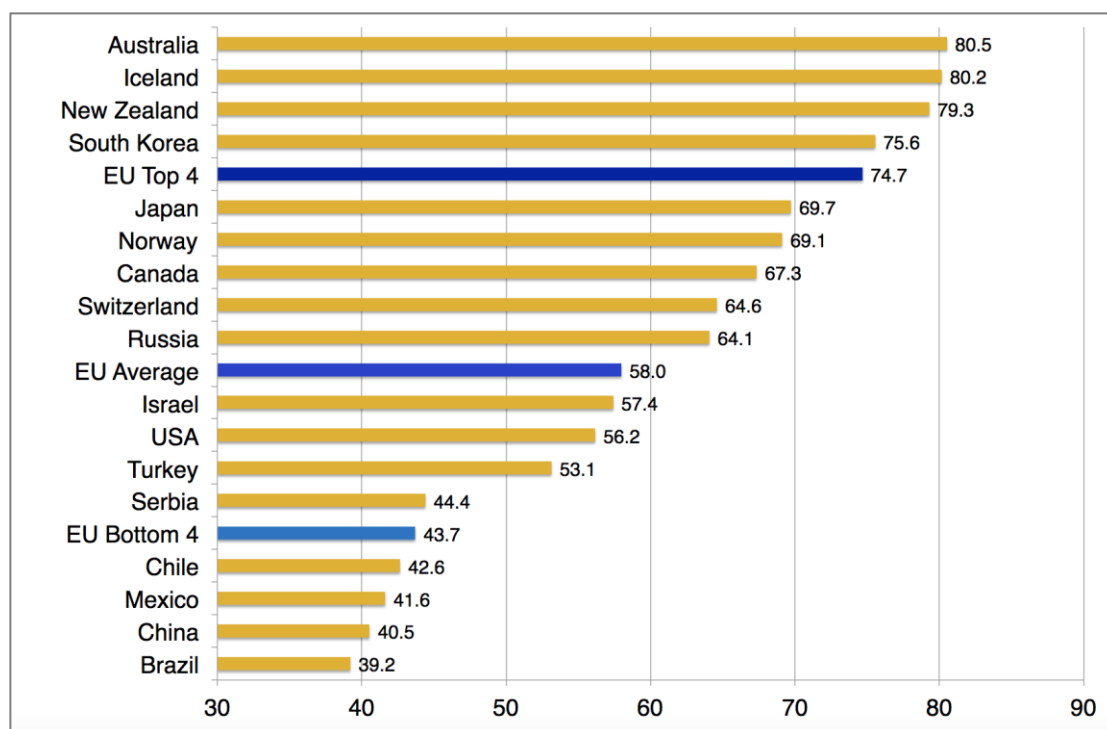
**Figure 6 Average performance scores for the human capital dimension**

In 2016 the EU28 Member State average performance<sup>17</sup> for the human capital dimension was 58.0, see Figure 7. Nine of the 17 non-EU countries had a higher score in 2016.

In 2016 the top four EU28 Member States (average score 74.7) performed behind South Korea and three other non-EU countries, but ahead of Japan and the USA. The average score for the bottom four EU28 Member States (43.7) is ahead of China and three other non-EU countries.

During the four year period examined in this study the average EU28 human capital score increased by 11 per cent from 52.3 in 2013 to 58.0 in 2016.

<sup>17</sup> Normalised and weighted score for the dimension, see chapter 3.



**Figure 7 Normalised scores for the human capital dimension in 2016**

Human capital analysis has two sub-dimensions, each comprised of two indicators. EU28 Member States are generally ahead of their non-EU counterparts for both sub-dimensions.

**a. Basic skills and usage:** This sub-dimension is comprised of two indicators. The first indicator examines *Internet use*. In 2016 the average level of Internet use was 81 per cent of the population in EU28 Member States. In 2016 in the top four EU28 Member States on average 91 per cent of the population used the internet. Three of the 17 non-EU countries had the same or a higher level of internet use in 2016.

In 2016 the average level of Internet use amongst the bottom four EU28 Member States averaged 71 per cent. Three of the non-EU countries had a lower level of internet use.


The second indicator in this sub-dimension uses ITU data to examine *regular Internet use*. In 2016 the average level of regular Internet use in EU28 Member States was 79.2 per cent. Nine of the 17 non-EU countries had a higher level of internet use in 2016.

Regular Internet use by the top four EU28 Member States in 2016 was 89.6 per cent. Five of the non-EU countries had a higher level of regular internet use.

Regular internet use was higher in the bottom four performing EU28 Member States (average 69.5 per cent) than for six non-EU countries.

**b. Advanced skills development:** This sub-dimension is comprised of two indicators.

The first indicator uses World Economic Foundation data about *employment in knowledge intensive industries*. In 2016 42.1 per cent of EU28 Member State employment was in these industries. Nine of the 17 non-EU countries had a higher level of employment in these industries in 2016.



The average level of employment amongst the top four EU Member States was 45.3 per cent. Three of the non-EU countries had a higher level of employment in these industries in 2016.

The average level of employment in knowledge intensive industries amongst the bottom four EU28 Member States was 39.8 per cent. Seven of the 17 non-EU countries had a lower level of employment in these industries in 2016.

The second indicator uses UNESCO data to examine the number of tertiary **graduates in ICT as a proportion of all graduates**. This indicator has a slightly different focus than the EU DESI, which examines all STEM (science, technology, engineering and mathematics) subjects.

EU Member States on average had 22 per cent of graduates in ICT in 2016. Five of the 17 non-EU countries had a lower proportion of graduates in 2016.

The four top performing countries have far higher proportions of ICT graduates than the average. In 2016 the top four EU Member States on average had 40 per cent of graduates in ICT. Four of the non-EU countries had the same or a higher proportion of graduates.

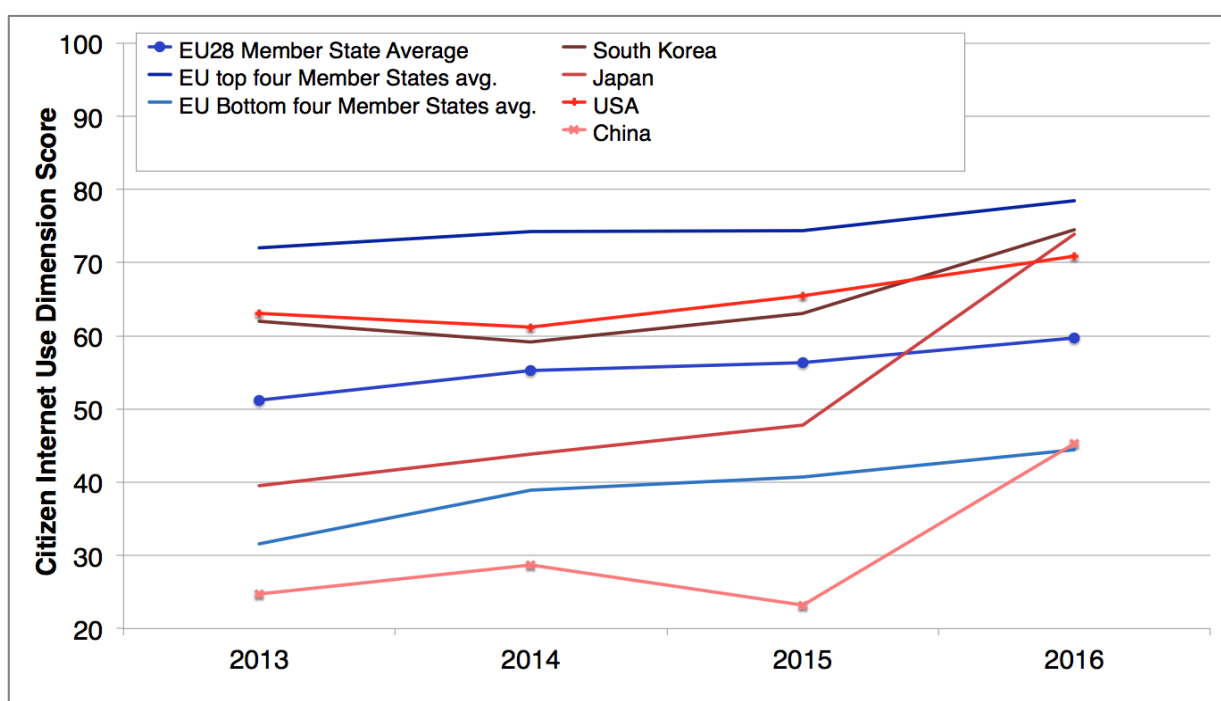
In 2016 the bottom four EU Member States on average had 14 per cent graduates in ICT. None of the 17 non-EU countries had a proportion of graduates this low.

## 2.5. The Citizen Internet Use dimension

There are five indicators that comprise the four sub-dimensions that make up the citizen Internet use dimension. The dimension examines the variety of activities and devices used by citizens already online.

3 Citizen use of Internet	Content (3a)	News (3a1)
	Communications (3b)	Social networks (3b1)
	Transactions (3c)	Banking (3c1)
		Shopping (3c2)
	Ubiquitous use (3d)	Average number of devices used (3d1)

Figure 8 provides an overview of the average performance score for the citizen Internet use dimension.



**Figure 8 Average performance scores for the citizen internet use dimension**

In 2016 the EU28 Member State average performance<sup>18</sup> for the dimension was 59.7, see Figure 8. Seven of 17 non-EU countries, including South Korea, Japan and USA, exceeded this figure.

In 2016 the top four EU28 Member States had an average score of 78.5. Only one non-EU country exceeded this score. The top four EU28 were four points or more ahead of South Korea (74.5), Japan (73.9) and the USA (71.0), see Figure 9.

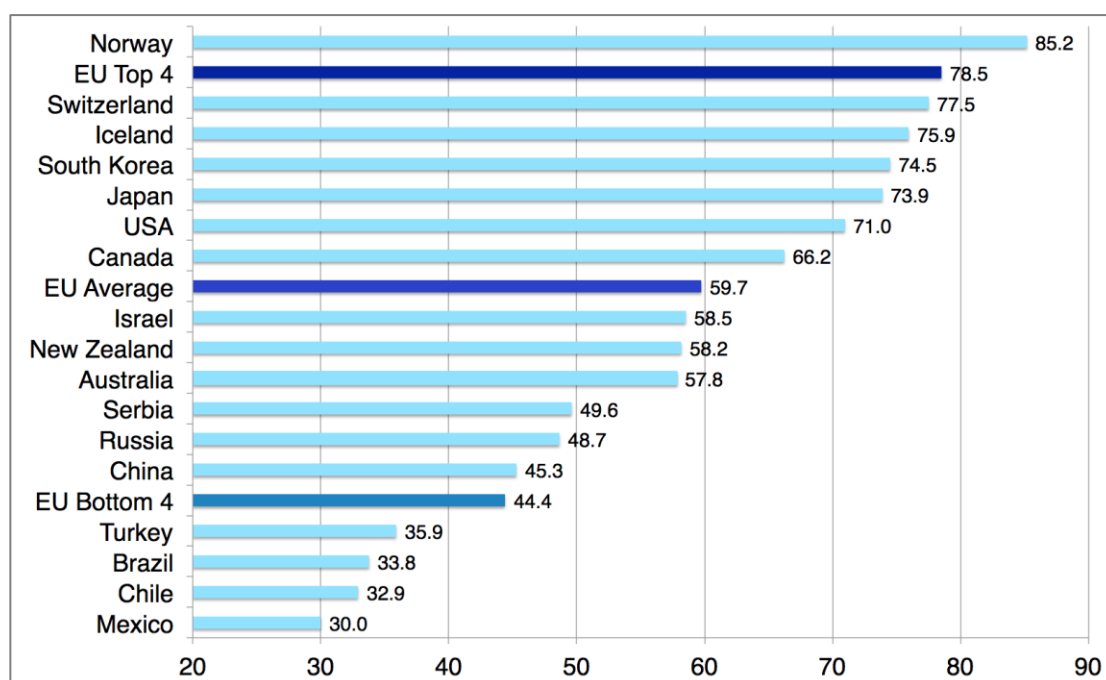
Figure 9 provides 2016 average normalised data scores for the 17 non-EU countries and EU28 Member State.

<sup>18</sup> Normalised and weighted score for the dimension, see chapter 3.

In 2016 the average score for the bottom four EU28 Member States was 44.4. This was just behind China (45.3) but ahead of four other non-EU countries.

During the four year period examined in this study the average EU28 citizen Internet Use score increased by 17 per cent from 51.2 in 2013 to 59.7 in 2016.

Between 2013 and 2016 performance of the top four EU28 Member States has grown considerably: Increasing from 72.1 in 2013 to 78.5 in 2016 (an increase of nine per cent). The bottom EU28 Member States have also increased their performance. In 2013 the average for the bottom four EU28 Member States was 31.6. By 2016 this had increased by 40 per cent to 44.4.



**Figure 9 Normalised scores for the citizen Internet use dimension in 2016**

The remainder of this section examines scores and rates of change within the four sub-dimensions that comprise the citizen Internet use dimension.

**a. Content:** This sub-dimension is only comprised of one indicator – an OECD statistic showing the *proportion of the population reading news online* in the last three months. In 2016 the average level of news use was 63 per cent of the population in EU28 Member States. Nine of the 17 non-EU countries had a higher level of news readership in 2016.

The average level of news reading in the top four EU28 Member States was 79 per cent in 2016. Four of the 17 non-EU countries had a higher level of news readership in 2016. In the same year the average level of news reading amongst the bottom four EU28 Member States was 51 per cent. Seven of the 17 non-EU countries had a lower level of news readership in 2016.

**b. Social media:** The second indicator in this sub-dimension uses World Economic Forum data to examine *social media use*<sup>19</sup>. In 2016 the average

<sup>19</sup> The WEF indicator uses a 1 to 7 scale. To make analysis easier to understand normalised scores are presented.

normalised score for EU28 Member States was 77.0. Nine of the 17 non-EU countries had a higher level of social media use.

**c. Transactions:** The third sub-dimension is comprised of two indicators. The first uses OECD data examining the proportion of the population using **Internet banking** in the last three months. 51.8 per cent of the population in EU28 Member States made use of Internet banking in 2016. The average level of Internet banking use in the top four EU28 Member States was 82.1 per cent. Only one of the 17 non-EU countries had a higher level of banking.

The average level of Internet banking use in the bottom four EU28 Member States was 24.2 per cent. Four of the 17 non-EU countries had a lower level of banking.

The second transaction sub-dimension indicator examined the proportion of the population undertaking **Internet shopping**. In EU28 Member States in 2016 on average 49.6 per cent undertook shopping. Eight non-EU countries exceeded this level of Internet shopping. For both groups of countries there was a relatively large increase. In 2013 only 37.1 per cent in the EU28 Member States shopped online.

**d. Devices:** The final indicator for this dimension examines the **average number of devices used** per person. This indicator has shown a relatively large increase in the four years examined by the study. In 2013 the number of devices in EU28 Member States was 2.3. Four years later, in 2016, the number had increased to 2.7.

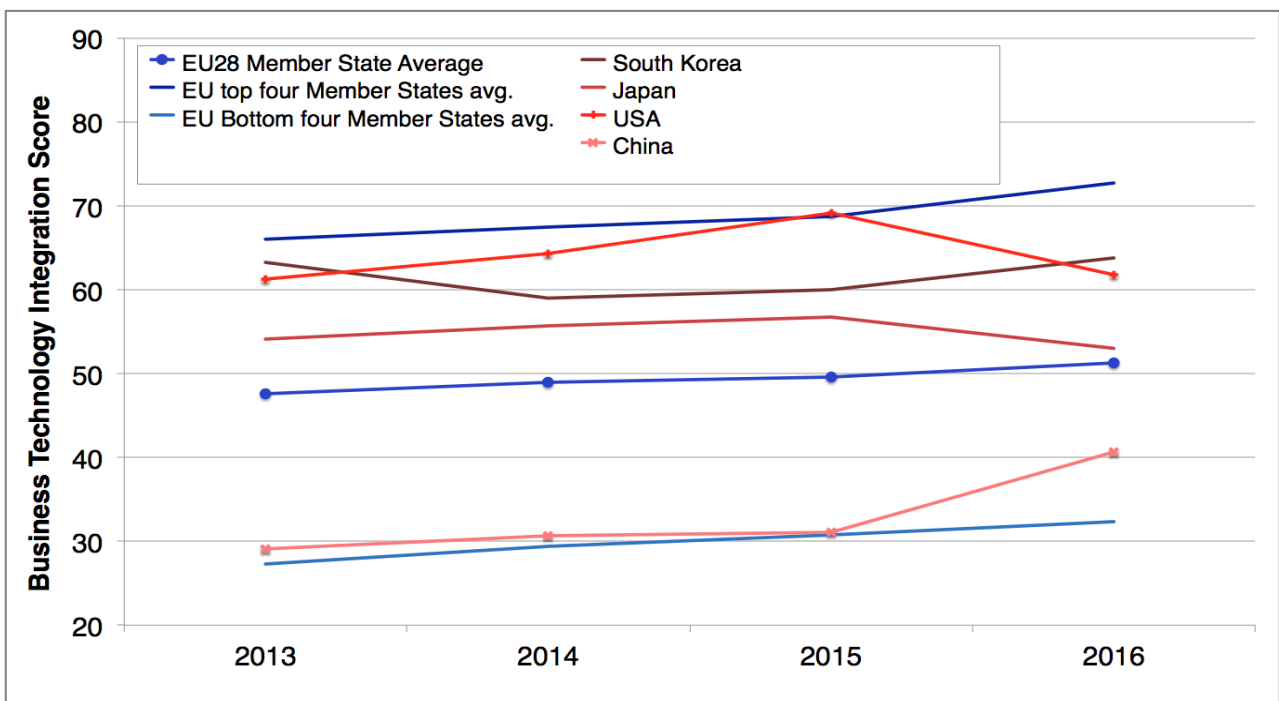
In 2016 the average number of devices used in the top four EU Member States was 3.4. Four of the 17 non-EU countries had the same or a higher level of device use.

## 2.6. The Business Technology Integration dimension

This dimension measures the digitisation of businesses and development of the online sales channel. The two sub-dimensions are comprised of five indicators.

4 Business technology integration	Business digitisation (4a)	Technology availability (4a1)
		Technology absorption (4a2)
		Social media (4a3)
	eCommerce (4b)	Business to business internet use (4b1)
		Secure internet servers (4b2)

Figure 10 provides an overview of average performance scores for the dimension.



**Figure 10 Average scores for the business technology integration dimension**

In 2016 the EU28 Member State average performance for the dimension was 51.3. Nine of 17 non-EU countries had a higher score in 2016.

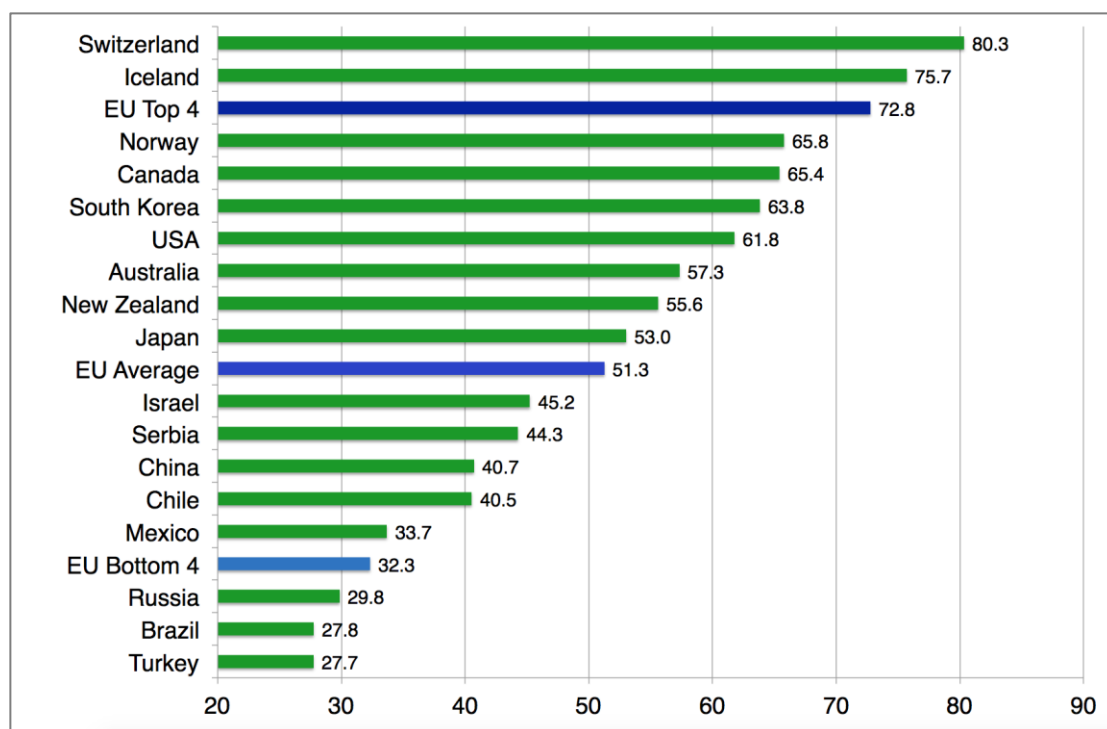
Figure 10 shows that in 2016 the average business technology integration score for the leading four EU28 Member States (72.8) was considerably ahead of South Korea (63.8), Japan (53.0) and the USA (61.8). Indeed, only two non-EU countries were ahead of the top four EU28 Member States, see Figure 11.

In 2016 the average score for the bottom four EU28 Member States (32.3) is ahead of three non-EU countries, but some way behind China (40.7).

During the four year period examined in this study the average EU28 business technology integration score increased by eight per cent from 47.6 in 2013 to 51.3 in 2016.

Figure 11 provides 2016 normalised data scores for the 17 non-EU countries and EU28 Member State averages.





**Figure 11 Normalised country scores for the business technology integration dimension in 2016**

The remainder of this section examines scores and rates of change for the five indicators that comprise the business technology integration dimension.

**a. Business digitisation:** This sub-dimension is comprised of three indicators. Two are derived from the World Economic Foundation and a business social media use indicator obtained from the United Nations. The two World Economic Foundation indicators use a scale from 1 to 7. To provide an easier understanding normalised scores are presented.

The first World Economic Foundation indicator provides details of businesses' views about the **availability of the latest technology**. In 2016 in EU28 Member State businesses the average normalised score was 68.4. Nine of the 17 non-EU countries had a higher score.

The second World Economic Foundation indicator provided details about the business level **technology absorption**. In 2016 the average normalised score for EU28 Member State businesses was 55.7. Eight of the non-EU countries had a higher score.

The final indicator in this dimension examined **business use of social media**. EU28 Member States consistently perform less well than the non-EU countries. The average level of social media use in EU28 Member States was 45 per cent. 12 of the non-EU countries had a higher score in 2016.

**b. eCommerce:** The two indicators that comprise this dimension were provided by the World Economic Foundation and the World Bank. There was a surprising paucity of robust eCommerce data.

World Economic Foundation data examines **business-to-business Internet use**. The indicators use a scale from 1 to 7. Normalised scores are compared. In 2016

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EU28 Member States had an average score of 58.5. Eight of the 17 non-EU countries had a higher score.

The final indicator for this dimensions examined the number of **secure Internet servers** per one million people. Secure servers are required to support eCommerce. The average number of secure servers per million people in EU28 Member States in 2016 was 1,009. Table 30 reveals that the non-EU country average is 1,059 and two countries have more than 3,000 secure servers per million people (Iceland 3,151 and Switzerland 3,063).

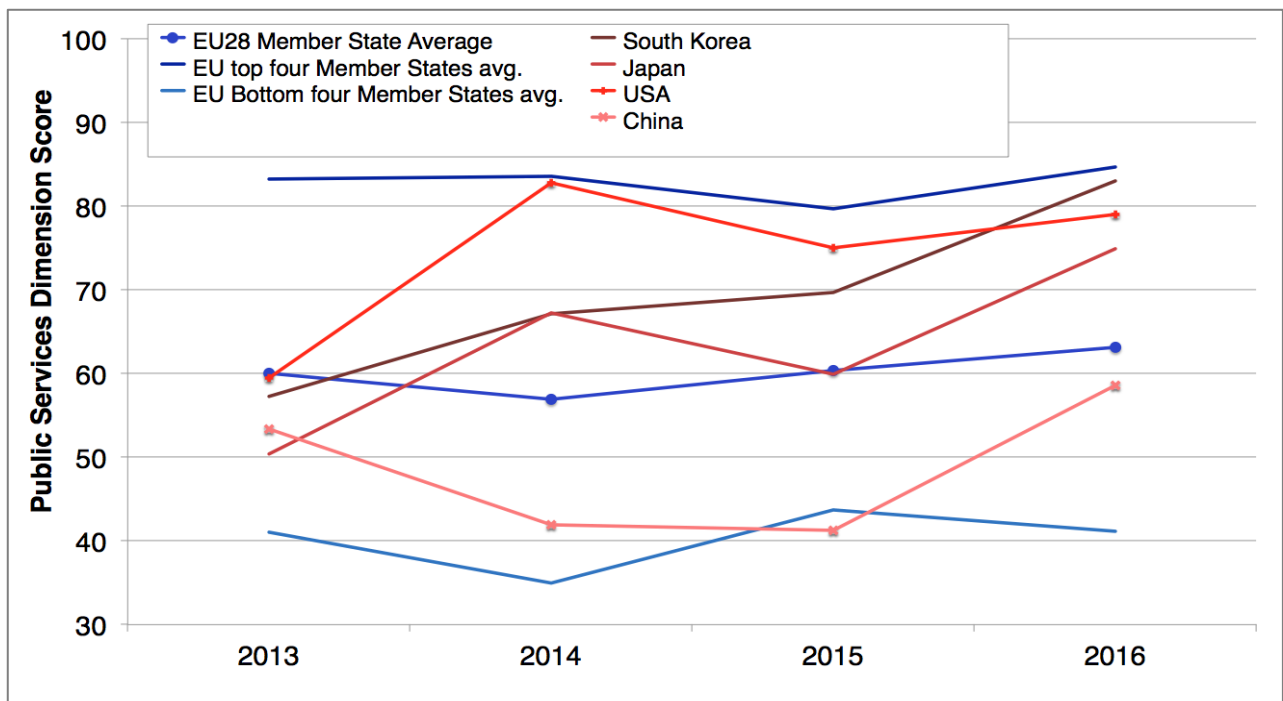
## 2.7. The Digital Public Services dimension

There are three indicators that comprise the digital public services dimension. This dimension measures the digitisation of public services, focusing on eGovernment.

5 Digital public services	eGovernment development index (5a)	eGovernment development index (5a1)
		Online service completion (5a2)
		Open data (5a3)

Figure 12 provides an overview of the average performance score for the dimension. Digital public services is the only dimension, of five examined, where the EU28 Member State average score is consistently behind the non-EU countries.

In 2016 the EU28 Member State average performance for the digital public services dimension was 63.1. Nine of the 17 non-EU countries, including South Korea, USA and Japan) had a higher score in 2016, see Figure 12.



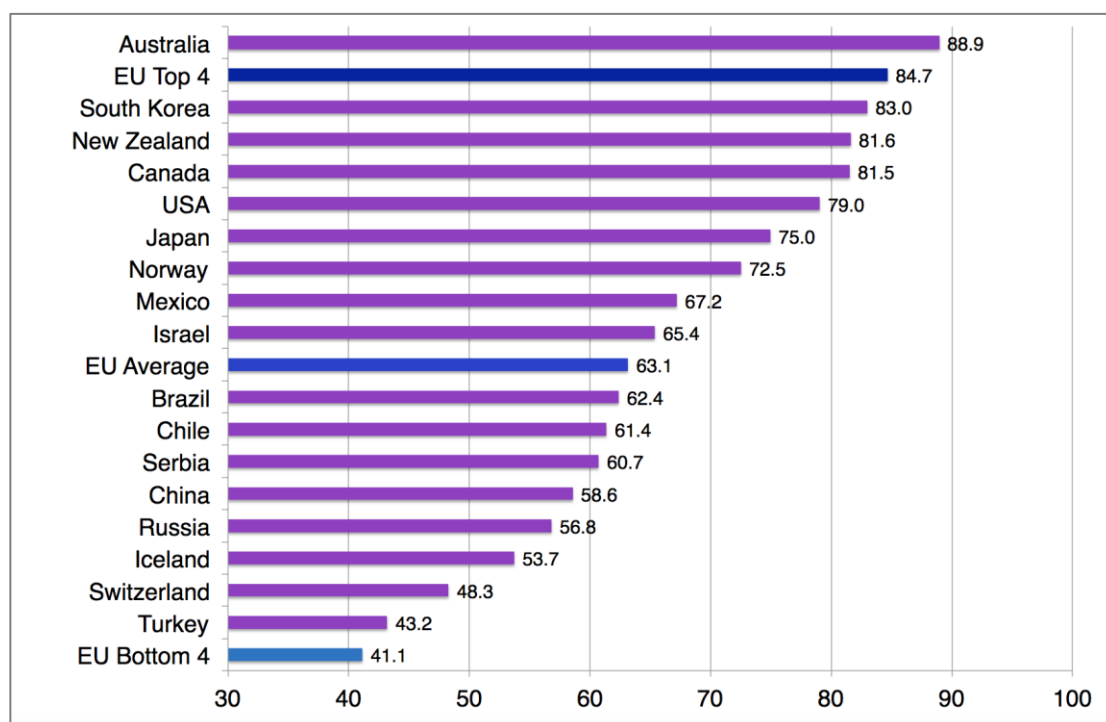
**Figure 12 Average performance scores for the public services dimension**

Figure 12 shows that in 2016 the average digital public services dimension score for the leading four EU28 was 84.7. Only one non-EU country had a higher score.

The average score for the bottom four EU28 Member States was 41.1. This score was behind China and all other non-EU countries, see Figure 13.

During the four year period examined in this study the average EU28 digital public services dimension score increased by five per cent from 60.1 in 2013 to 63.1 in 2016.

Figure 13 provides 2016 normalised data scores for the 17 non-EU countries and EU28 Member State averages.



**Figure 13 Normalised scores for the public services dimension in 2016**

The first indicator for this dimension utilises the UN eGovernment survey main **eGovernment index** score. In 2016 the average EU28 Member State score was 75.6. Nine of the 17 non-EU countries had a higher score.

The top four countries from both groups were also evenly matched. In 2016 the top four EU28 Member States had a score of 86.2. Three of the non-EU countries had a higher score. The bottom four EU28 Member States recorded an average score of 60.9 in 2016. Only one of the non-EU countries had a lower score.

The second indicator utilises the UN eGovernment survey measure for **online service completion**. In 2016 the EU28 average normalised score was 75. Twelve of the 17 non-EU countries had a higher score.

The final indicator used an Open Knowledge Foundation Network measure for **open data**. In 2016 the average score for EU28 Member States was 55.6. Nine of the 17 non-EU countries had a higher score.

In 2016 the top four EU28 Member States had an average score of 78.9 (out of 100) indicating relatively high levels of access to government data and information. Only one of the non-EU countries had a higher score. The bottom four EU28 Member States had an average score of 48.3. Six of the non-EU countries had a lower score.

## 2.8. Conclusions and observations

Analysis has shown that EU28 Member States compare well with the 17 non-EU countries and the very best EU28 countries are at the same or a higher level than the best global countries. Indeed Denmark was the leading country in the **I-DESI index**.

Denmark was also the leading country in the EU28 DESI<sup>20</sup>. The leading non-EU country, which came second of all 45 countries studied, was South Korea. In third place was Finland, which was the second best performing EU28 Member State in the 2016 DESI. EU28 Member States filled six of the top ten positions for the main I-DESI index.

The average performance of EU28 Member States was above eight of the 17 non-EU countries in the main I-DESI index, see Table 5.

The **Connectivity dimension** – examining the deployment and take-up of fixed and mobile broadband - is the area where the EU28 average compares well with non-EU countries, see Table 6. The strongest areas in this dimension for EU28 Member States are the broadband coverage and take-up sub-dimension and broadband prices.

EU28 Member States also performed better than their 17 global counterparts in the **Citizen Use of the Internet dimension**, see Table 19. EU28 Member States do not significantly out-perform their global counterparts in any of the sub-dimensions, but they are consistently just ahead of them.

The Digital Single Market Strategy has several economic objectives, including job creation and economic growth. The **Business Technology Integration dimension** looked specifically at the digitisation of businesses. In 2016 the average EU28 Member State performance for this dimension drew level with non-EU countries for the first time since 2013, see Table 25.

**Public Services** is the one dimension where EU28 Member States have consistently performed below their 17 non-EU counterparts, see Table 31.

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<sup>20</sup> Comparison is with the 2017 I-DESI which, like this study, examined 2016 EU28 Member State data.

## 3. The methodology

### 3.1. Introduction

This chapter describes the methodology used to create the 2018 I-DESI. I-DESI follows as closely as possible the methodology used in creating the EU28 DESI. Where feasible the indicators are as closely matched as possible between the two studies. Analysis follows exactly the same mathematical procedures. This includes the six stage approach described in the remainder of this chapter:-

- Data collection, selection and validation;
- Normalisation;
- Estimation of missing values;
- Application of weights;
- Correlation analysis;
- Calculation of the final index.

### 3.2. Data collection, selection and validation

The starting point for the 2018 I-DESI was consideration of indicators used in previous analysis and a search for alternative or better sources. In a quest to develop four years of trend data, to enable better comparison with EU28 DESI trends, it was also necessary to avoid 'one-off' studies. Ideally it would also have been useful to avoid studies that only collected data on a bi-annual basis. But, as Figure 14 shows, this was not possible and three variables of this type were included<sup>21</sup>.

A thorough but pragmatic approach was taken during indicator selection. 26 possible new surrogate indicators were proposed. After consideration of the closeness of the match with EU28 DESI indicators, country coverage and extent of missing values seven were selected. Two were ultimately omitted during analysis due to poor alignment and correlation problems.

Finally, the data selection process was keen to include additional countries in the study. The previous I-DESI study had 15 countries. This study has the same 15 and Chile and Serbia<sup>22</sup> have also been added, making a total coverage of 17 countries in total. Data were available for many other countries, but not quite with the level of coverage to robustly include them in this year's study.

As section 3.6, examining correlations, shows the match-up between I-DESI and EU28 DESI indicators is generally good. Perfection could only be achieved if the sample sizes and data collection methods used by national statistical agencies in EU28 Member States was replicated in other countries.

An overview of all the indicators used in the study is provided in Annex 1. It is wise to provide clear definitions of key terms used since some international data sources appear to confuse connectivity with take-up.

**Broadband** – Broadband is the term applied to high speed telecommunications systems, i.e. those capable of simultaneously

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<sup>21</sup> UNCTAD and UN eGovernment survey data.

<sup>22</sup> Serbia is one of the EU28 candidate countries.

supporting multiple information formats such as voice, high-speed data services and video services on demand<sup>23</sup>. Broadband is comprised of both the connection to a network capable of supporting suitable bandwidth and the Internet access service delivered over that connection. The European Commission regarded 144 Kbps as the minimum level to define broadband<sup>24</sup>. Next Generation Access (NGA)<sup>25</sup> is commonly thought to provide a download speed of 24 Mbit/s<sup>26</sup>

**Connectivity** – A broadband connection can be provided by fixed or wireless technologies. The term ‘connectivity’ is used to describe a household, business or location where a broadband network is available and there is the capability to connect to that broadband network. The terms ‘coverage’ and ‘availability’ can also be used to refer to locations with broadband connectivity.

**Subscription** – If a user has a connection available, they can choose (or not) to subscribe and use a broadband network. The terms ‘penetration’ or ‘take-up’ refer to percentage of households or locations that have subscribed to and use broadband relative to the total number of households.

### 3.3. Data normalisation

The first step of the data normalisation process was to set reference years for each data set. For all indicators, reference years will be lagging one or two years behind the year in which the I-DESI study is undertaken - 2018. Unlike some studies this research explicitly makes clear the year in which the original data was collected, historic data is not misrepresented as coming from a later time period<sup>27</sup>.

All data sets in the 2018 I-DESI relate to the period between 2013 and 2016. For nine of the 26 indicators data was available for 2017. This level of indicator coverage (35 per cent) was considered to be too low to warrant inclusion in the study. However, where relevant, 2017 results used to provide further information.

Reference years are required to ensure that all data comes from a similar time period and is thus more comparable. Reference years provide parameters for examining momentum scores using CAGR<sup>28</sup> and will provide time spans for imputing missing values.

The calculation of **maximum and minimum scores** indicators is a traditional method used for calculating **normalised** scores. The maximum score is usually calculated by finding the highest score for the whole time period within all countries excluding

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<sup>23</sup> EC. 2015. Broadband glossary. <https://ec.europa.eu/digital-agenda/en/broadband-glossary>.

<sup>24</sup> Digital Agenda targets require EU28 Member States to be covered by broadband speeds above 30 Mbps by 2020, while 50 per cent or more of EU households should subscribe to broadband speeds above 100Mbps.

<sup>25</sup> Provided through access networks which consist wholly or in part of optical elements and which are capable of delivering broadband access services with enhanced characteristics (such as higher throughput) as compared to those provided over already existing copper networks. The EC does not specify a threshold speed for NGA.

<sup>26</sup> Wikipedia [https://en.wikipedia.org/wiki/Fiber\\_to\\_the\\_x](https://en.wikipedia.org/wiki/Fiber_to_the_x)

<sup>27</sup> Some previous benchmarking studies have used historic data and presented it in analysis as being collected in a more recent year (for example one study misrepresented data from 2011 as being collected in 2014).

<sup>28</sup> Compound Annual Growth Rate.

positive outliers<sup>29</sup>. Similarly, the minimum score is the lowest score found for the whole time period within all countries excluding negative outliers<sup>30</sup>.

To ensure comparability with the EU28 DESI this study adopted the same minimum and maximum values adopted by the 2018 EU28 DESI. The maximum and minimum values can be seen in Annex 2.

It should be noted that the selection of maximum and minimum values can have a large impact on scores created in any index.

The calculation of a **normalised** or re-scaled country indicator scores for an indicator (in country X) is found by first subtracting the minimum score (from the indicator score for country X) and then dividing by the difference between the maximum and minimum score. The maximum normalised score is thus equal to 1, and the minimum normalised score is equal to 0.

The impact of changing maximum and minimum scores can be illustrated with a simple example. If an indicator for a country (perhaps 4G coverage) was 70 per cent and minimum and maximum scores across the population of countries analysed was 0 and 80 per cent the country will score 87.5 ( $[70 - 0] / [80 - 0]$ ). If the minimum score was increase to 40 (and the maximum remained at 80) the score would decrease to 75. If the minimum was 40 and the maximum increased to 100 the score would decrease further to 50.

This means that in chapter 2 when analysing scores and percentage rates of change (2013 to 2016) comparisons within a sub-dimension are robust. Therefore comparisons between EU28 and non-EU countries are valid and assessments of better or worse performing countries (e.g upper and lower quartiles) are acceptable.

But comparisons between scores and rates of change between one sub-dimension and another will not generally be advisable, unless the indicator or sub-dimensions is measuring items on a similar scale (e.g. 0 to 100 per cent, where all countries are able to achieve the maximum value).

In all calculations a higher score indicated a better performance. In I-DESI there is one indicator where a 'negative direction' indicates better performance - Fixed broadband price (1d1), values for this indicator were transposed so that better performance is reflected by a higher score, see section 2.3.

### 3.4. Missing values

Careful selection of variables at the start of the project, see section 3.2, meant that the number of missing values was relatively small.

Missing values largely concerned 15 periods of one year where data was not collected, see the brown blocks in Figure 14<sup>31</sup>. For example the figure shows the bi-annual availability of data in 2014 and 2016 for UN online service completion and eGovernment indicators 5a3 and 5a1 respectively).

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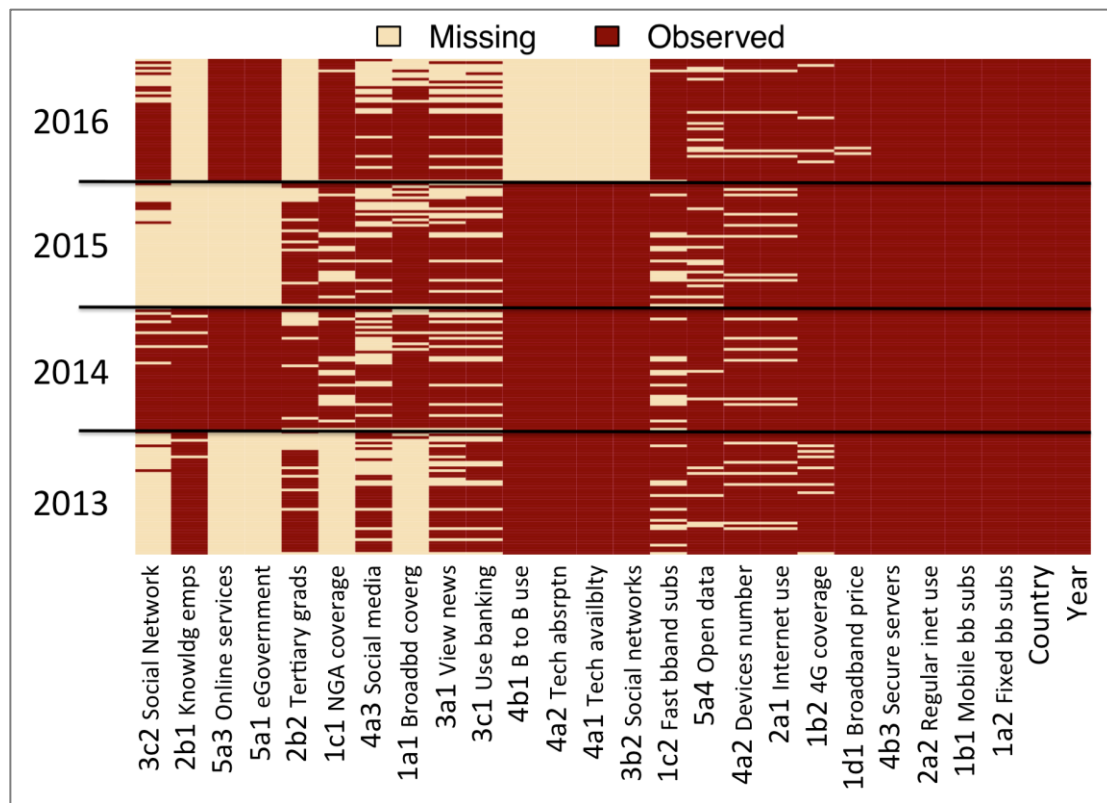
<sup>29</sup> If there is an extreme outlier in the data set, a maximum value is set as the next highest data point value, and the outlier is given the maximum possible score. Positive outliers will be identified as country scores which are higher than the mean across all countries plus twice the standard deviation.

<sup>30</sup> Minimum outliers are treated in a similar way as those for maximum values, see the preceding footnote. Negative outliers will be identified as country scores which are lower than the mean across all countries minus twice the standard deviation.

<sup>31</sup> The graphic shows abbreviated names for indicators on the horizontal axis and representation for countries between 2013 and 2016 for indicators. The map is generated using the latest Amelia version



The remainder of the 389 missing data points were relatively randomly distributed throughout otherwise complete data sets<sup>32</sup>. These are represented by thin brown lines in Figure 14.



**Figure 14 Distribution of missing values**

Given a reliance on secondary data to build the 2018 I-DESI it was necessary to make estimations to compensate for missing and incomplete data. We followed a 'tried and tested' logic, and a systematic process for estimating missing data points. A two-step process was adopted<sup>33</sup>:

1. The first step identified missing data points that do not require mathematical estimations but could be found by research;
2. If the missing value of an indicator could not be determined through literature review, we used Harvard economist Gary King's estimation software program Amelia II<sup>34</sup>. This estimated missing data by performing multiple imputations, as a general-purpose approach to missing values. The multiple imputations method has been shown to reduce bias and increase efficiency.

It should be noted that unlike previous research this study did not resort to utilising data from previous years (without adjustment) to fill missing data gaps. Neither is the historic data mis-represented as coming from later years in

<sup>32</sup> In total there were 4,320 data points.

<sup>33</sup> In chronological order.

<sup>34</sup> King G et al. 2011. Amelia II: A Program for Missing Data - Journal of Statistical Software. 45, 7. Amelia II is a complete R package for multiple imputation of missing data. <https://www.jstatsoft.org/article/view/v045i07/v45i07.pdf>

calculations. The data collected and presented in this study is for the period from 2013 to 2016.

### 3.5. Applying weights

The EU28 DESI has adopted a weighting system for dimensions and sub-dimensions. The same weighting system, subject to small changes is used in this study. This study includes a sub-dimension for ubiquitous device use (3d1). Suitable information was not available for non-EU countries about ultrafast broadband or eHealth. These dimensions were therefore omitted from I-DESI.

**Table 1 2018 DESI data methodology weights**

1 Connectivity 25 per cent	Fixed broadband 33 per cent
	Mobile broadband 22 per cent
	Speed 33 per cent
	Affordability 11 per cent
2 Digital Skills 25 per cent	Basic skills & usage 50 per cent
	Advanced skills 50 per cent
3 Citizen use of Internet 15 per cent	Content 33 per cent
	Communications 16.5 per cent
	Transactions 33 per cent
	Ubiquitous use 16.5 per cent
4 Business integration 20 per cent	Business digitisation 60 per cent
	eCommerce 40 per cent
5 Digital public services 15 per cent	eGovernment 100 per cent

The weighting system reflects the relevance of indicators see Table 1. Figures on the left provide the weights for the dimensions; those to the right provide the weighting for each sub-dimension.

### 3.6. Correlations

The study undertook correlations and covariance testing of indicators, sub dimensions and dimensions to minimise covariance in any new or replacement indicators that might be included in the proposed study.

Table 2 show the correlation values between dimensions and the overall index for EU28 DESI and I-DESI scores between 2014 and 2016. Correlation measures how close two variables are to having a linear relationship with each other<sup>35</sup>. A score of 1

indicates a perfect linear relationship between variables. Scores above 0.7 are generally regarded as displaying a strong relationship.

Table 2 shows a very high level of correlation for the overall DESI and I-DESI index scores. All values are above 0.92<sup>36</sup>, indicating a very high level of correlation between the 24 indicators used in this I-DESI study and the 33 indicators used in the DESI in 2014 to 2016.

As might be expected the level of correlation decreases as one examines smaller numbers of indicators. Correlations are highest for Connectivity (dimension 1; average correlation 2013 to 2016 is 0.86). The I-DESI study found seven variables that provided very close surrogate indicators with the variables used in the same dimension in the EU28 DESI.

Values for dimensions two (Human Capital; average 0.84) and three (citizen use; average 0.84) are good. It was also possible to find every good surrogate indicators for those used in the EU28 DESI from alternative sources.

Dimension four (business technology integration; average 0.66) was particularly problematical in the 2016 I-DESI. Few international studies examine the adoption of particular technologies in that same way that DESI has collected information about technologies such as electronic information sharing, RFID, social media, eInvoices and cloud computing. It was possible to find a surrogate for social media<sup>37</sup>, but the remaining variables selected had a more generic focus on technologies<sup>38</sup>. As a result the degree of correlation of this dimension of the I-DESI only has an average correlation between 2013 and 2016 of 0.66 with the EU28 DESI dimension score.

Dimension five (digital public services; average correlation 0.69) was also problematical when trying to find surrogates. The EU28 DESI has six indicators<sup>39</sup> and makes good use of EU eGovernment benchmark reports. Due to a paucity of surrogates the I-DESI only has three indicators. The UN eGovernment survey provides two of the variables but they have a more general focus than those used in the EU28 DESI<sup>40</sup>. The one variable it was possible to replicate was 'open data' from the Open Knowledge Foundation.

**Table 2 Correlations between score of EU28 Member States for I-DESI and EU28 DESI 2014 TO 2016**

	2016	2015	2014	2013	Avg.
<b>Overall Index</b>	<b>0.93</b>	<b>0.93</b>	<b>0.95</b>	<b>0.93</b>	<b>0.94</b>
1 Connectivity (7 I-DESI indicators)	0.84	0.82	0.92	0.85	0.86
2 Human capital (4)	0.81	0.86	0.87	0.81	0.84

<sup>36</sup> The 2014 correlation achieved in this study is a considerable improvement on the figure for the same year estimated in the 2016 I-DESI study (2014 - 0.91).

<sup>37</sup> The OECD statistics correlated well with EU28 DESI sub-dimension – 0.763.

<sup>38</sup> For example 4a1 examined technology availability and 4a2 firm level technology absorption.

<sup>39</sup> Including eHealth, introduced for the first time in 2018.

<sup>40</sup> For example EU28 DESI has indicators for government users, pre-filled forms and digital services for businesses. These are not replicated in the UN study.

3 Citizen internet use (5)	0.84	0.85	0.87	0.80	0.84
4 Business technology integration (5)	0.59	0.71	0.70	0.64	0.66
5 Public services (3)	0.76	0.68	0.59	0.75	0.69

Table 3 shows the correlation between rankings for the dimensions and the overall index for DESI and I-DESI scores between 2013 and 2016. Correlation measures are broadly similar to Table 2 across all dimensions and for the overall DESI and I-DESI indexes.

**Table 3 Correlations between rankings of EU28 Member States for I-DESI and EU28 DESI 2014 TO 2016**

	2016	2015	2014	2013	Avg.
<b>Overall Index</b>	<b>0.92</b>	<b>0.93</b>	<b>0.97</b>	<b>0.93</b>	<b>0.94</b>
1 Connectivity (7 I-DESI indicators)	0.85	0.81	0.90	0.84	0.85
2 Human capital (4)	0.82	0.86	0.88	0.82	0.84
3 Citizen internet use (5)	0.76	0.82	0.82	0.76	0.79
4 Business technology integration (5)	0.56	0.71	0.68	0.60	0.64
5 Public services (3)	0.78	0.67	0.64	0.76	0.71

The two tables show a relatively high degree of correlation between the EU28 DESI and I-DESI scores and dimension. This means that relationships between the two indexes should be relatively robust. Comparison between the performances of the 45 countries analysed in this study are therefore valid.

### 3.7. Calculating the final index


The final stage of analysis was the calculation of the I-DESI index.

The **methodology for aggregating indicators** into sub-dimensions, sub-dimensions into dimensions, and dimensions into the overall index followed a relatively simple bottom-up approach. The approach applied weighted arithmetic averages following the structure of the index. The 2018 DESI methodology provides an example of how the top-level DESI score can be calculated for country X using the formula:

$$\text{I-DESI}_{\text{Country X}} = \text{Connectivity}_{\text{Country X}} \times 0.25 + \text{Human Capital}_{\text{Country X}} \times 0.25 + \text{Use of Internet}_{\text{Country X}} \times 0.15 + \text{Integration of Digital Technology}_{\text{Country X}} \times 0.2 + \text{Digital Public Services}_{\text{Country X}} \times 0.15$$

Where  $\text{Connectivity}_{\text{Country X}}$  is the score obtained by country X in the Connectivity dimension, and so on for the remaining dimensions in the formula.

As noted previously data sources and normalised values for the above calculations are provided in Annex 1 and Annex 2 respectively.



The study also examined change by calculating the percentage for countries for indicators, sub-dimensions and dimensions for the four year period between 2013 to 2016 where data was available. This percentage figure allows a description of the rate at which an indicator, sub-dimension or dimension score is changing for a particular country over the four years investigated by the study.

## 4. Observations

### 4.1. Introduction

The introductory section noted, that like any benchmarking study, the 4,320 data points derived for 24 indicators have little meaning in themselves. Indeed, it is generally accepted that the role of a benchmarking exercise is to collect relevant evidence and present it without comment about recommendations or possible policy changes. In this respect this study will be no different.

As noted earlier the comparison of figures is where the story really lies and where readers will get greatest benefits from this study. Our analysis has, of necessity, been thorough but cursory. The 4,320 data points are provided to enable anyone to further analyse the data. As noted earlier many of the data sets also provide information about other countries beyond the 28 EU Member States and 17 non-EU countries examined in this study.

Many nations will have economic and cultural reasons for high or low scores in individual indicators. Care should therefore always be taken when making recommendations on the basis of simple comparisons between countries.

With this caveat in mind the primary observation our team would make arising from this study and other benchmarking exercises we have observed is to undertake correlation to determine which indicators are most significant or explain the most variance. This type of analysis can help to identify important topics or policy areas. Multivariate analysis, with additional indicators (such as GDP, GDP/capita, population size and density, topography, educational attainment levels, industrial structure) usually beyond the scope of the indicators considered in studies, can help to explain reasons for differences between countries. It can also help to provide evidence to change the compositions of indexes. Technology is changing the world, the various technology and innovation indexes used in this study, usually need to change more frequently to better understand and monitor these changes.

## 5. Annex 1: The 24 I-DESI indicators

**Table 4 The five dimensions and 24 indicators comprising the 2018 I-DESI**

Indicator	Code	Source
<b>1. Connectivity</b>		
Fixed Broadband Coverage	1a1	EC Broadband Coverage Report 2016
Fixed Broadband Take-up	1a2	International Telecommunications Union World Telecommunication/ICT Indicators database 2016
Mobile Broadband Take-up	1b1	International Telecommunications Union World Telecommunication/ICT Indicators database 2016
4G Coverage	1b2	International Telecommunications Union World Telecommunication/ICT Indicators database 2016
NGA Coverage	1c1	Akamai State of the Internet Quarterly Reports
Subscriptions to Fast Broadband	1c2	Akamai State of the Internet Quarterly Reports
Fixed Broadband Price	1d1	International Telecommunications Union World Telecommunication/ICT Indicators database 2016, World Bank Database
<b>2. Human Capital</b>		
Internet Users	2a1	The Connected Consumer Survey 2017
Regular Internet Users	2a2	International Telecommunications Union World Telecommunication/ICT Indicators database 2016
Employed in knowledge-intensive activities	2b1	World Economic Forum Networked Readiness Index 2016
Tertiary Graduates in ICT	2b2	UNESCO Institute for Statistics (UIS)
<b>3. Citizen Internet Use</b>		
News	3a1	OECD. Stat Information & Communications Technology, ICT Access and Usage by Households and Individuals
Social Networks	3b1	World Economic Forum Networked Readiness Index 2016
Banking	3c1	OECD. Stat Information & Communications Technology, ICT Access and Usage by Households and Individuals
Internet shoppers as a % of population	3c2	UNCTAD E-Commerce Index 2017
Average number of devices used	3d1	The Connected Consumer Survey 2017
<b>4. Business Technology Integration</b>		
Availability of latest technologies	4a1	World Economic Forum Networked Readiness Index 2016
Firm-level technology absorption	4a2	World Economic Forum Networked Readiness Index 2016
Social Media	4a3	OECD. Stat Information & Communications Technology, ICT Access and Usage by Businesses
Business to Business Internet use	4b1	World Economic Forum Networked Readiness Index 2016
Secure Internet Servers	4b2	World Bank Data 2016
<b>5. Public Services</b>		
E-Government Development Index	5a1	UN E-Government Survey
Online Service Completion	5a2	UN E-Government Survey
Open Data	5a3	Open Knowledge International Global Open Data Index

## 5.1. Detailed description of dimensions and indicators

This section of Annex 1 provides a fulsome description of the 24 indicators used in the study. Annex 3 provides the scores for the 24 indicators, for 45 countries, each year from 2013 to 2016. In total 4,320 data points are provided.

## 5.2. Connectivity

### 5.2.1. Fixed Broadband Coverage (1a1)

**Description:** Overall fixed broadband coverage. Includes all the main fixed-line broadband access technologies, but excludes satellite. A combination of DSL (including VDSL), cable modem (including DOCSIS 3.0), FTTP and WiMAX.

**Unit:** Percentage of the population

**Main source:** European Commission Broadband Coverage Report 2016, plus desk research

### 5.2.2. Fixed Broadband Take-up (1a2)

**Description:** Fixed-broadband subscriptions refers to fixed subscriptions to high-speed access to the public Internet (a TCP/IP connection); at downstream speeds equal to; or greater than; 256 kbit/s. This includes cable modem; DSL; fibre-to-the-home/building; other fixed (wired)-broadband subscriptions; satellite broadband and terrestrial fixed wireless broadband. It includes both residential subscriptions and subscriptions for organizations.

**Unit:** Percentage of subscriptions per household

**Main source:** International Telecommunications Union World Telecommunication/ICT Indicators database 2016

### 5.2.3. Mobile Broadband Take-up (1b1)

**Description:** Active mobile-broadband subscriptions per 100 inhabitants.

**Unit:** Subscriptions per 100 inhabitants

**Main source:** International Telecommunications Union World Telecommunication/ICT Indicators database 2016

### 5.2.4. 4G Coverage (1b2)

**Description:** Percentage of the population covered by at least an LTE/WiMAX mobile network refers to the percentage of inhabitants that live within range of LTE/LTE-Advanced; mobile WiMAX/WirelessMAN or other more advanced mobile-cellular networks; irrespective of whether or not they are subscribers.

**Unit:** Percentage of the population

**Main source:** International Telecommunications Union World Telecommunication/ICT Indicators database 2016



### 5.2.5. NGA Coverage (1c1)

**Description:** Unique IPv4 addresses globally connecting to Akamai at average connection speeds of 15 Mbps.

**Unit:** Percentage of connections above 15 Mbps

**Main source:** Akamai State of the Internet Quarterly Reports

### 5.2.6. Subscriptions to Fast Broadband (1c2)

**Description:** Average Connection Speeds of unique IPv4 addresses connecting to Akamai.

**Unit:** Average Mbps

**Main source:** Akamai State of the Internet Quarterly Reports

### 5.2.7. Fixed Broadband Price (1d1)

**Description:** Yearly subscription charge (US\$) for fixed broadband Internet service as a percentage of GNI per capita. Fixed (wired) broadband is considered to be any dedicated connection to the Internet at; downstream speeds equal to; or greater than; 256 kbit/s.

**Unit:** Percentage of GNI per capita

**Main source:** International Telecommunications Union World Telecommunication/ICT Indicators database 2016

## 5.3. Human Capital

### 5.3.1. Internet Users (2a1)

**Description:** Personal Internet usage (accessing via computer, tablet or smartphone).

**Unit:** Percentage of individuals using the Internet

**Main source:** The Connected Consumer Survey 2017

### 5.3.2. Regular Internet Users (2a2)

**Description:** The number of regular internet users as a proportion of the total population of the country (individuals 5 years and older).

**Unit:** Percentage of population

**Main source:** International Telecommunications Union World Telecommunication/ICT Indicators database 2016

### 5.3.3. Employed in knowledge-intensive activities (2b1)

**Description:** Percentage of the workforce employed in knowledge-intensive jobs, which corresponds to the International Labour Organization (ILO) aggregate category "Managers, professionals, and technicians". Data is gathered from international

agencies such as the International Telecommunication Union, UNESCO, other UN agencies and the World Bank.

**Unit:** Percentage of the workforce

**Main source:** World Economic Forum Networked Readiness Index 2016

### 5.3.4. Tertiary Graduates in ICT (2b2)

**Description:** Percentage of graduates from tertiary education graduating from Information and communication technologies programmes as a share of graduates from ISCED 6 programmes in tertiary education.

**Unit:** Percentage of graduates

**Main source:** UNESCO Institute for Statistics (UIS)

## 5.4. Citizen Internet Use

### 5.4.1. News (3a1)

**Description:** Individuals aged 16-74 using the Internet for reading/downloading online newspapers/news magazines in the last 3 months.

**Unit:** Percentage of individuals

**Main source:** OECD. Stat Information & Communications Technology, ICT Access and Usage by Households and Individuals

### 5.4.2. Social Networks (3b1)

**Description:** In your country, how widely used are virtual social networks (e.g., Facebook, Twitter, LinkedIn)? Indicators come from the World Economic Forum's Executive Opinion Survey, which was completed by over 14,000 business executives in more than 140 countries.

**Unit:** Score of 1-7, 1 = not used at all; 7 = widely used

**Main source:** World Economic Forum Networked Readiness Index 2016

### 5.4.3. Banking (3c1)

**Description:** Individuals aged 16-74 using the Internet for Internet Banking in the last 3 months.

**Unit:** Percentage of population

**Main source:** OECD. Stat Information & Communications Technology, ICT Access and Usage by Households and Individuals

### 5.4.4. Internet Shoppers (3c2)

**Description:** The number of Internet shoppers as a share of the population. A combination of Eurostat, Pew, and national datasets are used to collect the data.

**Unit:** Percentage of population

**Main source:** UNCTAD E-Commerce Index 2017/6

#### **5.4.5. Average number of devices used (3d1)**

**Description:** The average numbers of devices an individual uses to access the Internet. Data was weighted according to local Census data. A Nationally representative total population (online & offline) aged 16+ in each country were surveyed.

**Unit:** Devices

**Main source:** The Connected Consumer Survey 2017

### **5.5. Business Technology Integration**

#### **5.5.1. Availability of latest technologies (4a1)**

**Description:** In your country, to what extent are the latest technologies available? The indicator came from the World Economic Forum's Executive Opinion Survey, which was completed by over 14,000 business executives in more than 140 countries.

**Unit:** Score of 1-7, 1 = not available at all; 7 = widely available

**Main source:** World Economic Forum Networked Readiness Index 2016

#### **5.5.2. Firm-level technology absorption (4a2)**

**Description:** In your country, to what extent do businesses adopt new technology? The indicator came from the World Economic Forum's Executive Opinion Survey, which was completed by over 14,000 business executives in more than 140 countries.

**Unit:** Score of 1-7, 1 = not at all; 7 = adopt extensively

**Main source:** World Economic Forum Networked Readiness Index 2016

#### **5.5.3. Social Media (4a3)**

**Description:** Businesses using social media as a percentage of all businesses (10 persons employed or more).

**Unit:** Percentage of Businesses

**Main source:** OECD. Stat Information & Communications Technology, ICT Access and Usage by Businesses

#### **5.5.4. Business-to-Business Internet Use (4b1)**

**Description:** In your country, to what extent do businesses use ICTs for transactions with other businesses? The indicator came from the World Economic Forum's Executive Opinion Survey, which was completed by over 14,000 business executives in more than 140 countries.

**Unit:** Score of 1-7, 1 = not at all; 7 = to a great extent

**Main source:** World Economic Forum Networked Readiness Index 2016

### 5.5.5. Secure Internet Servers (4b2)

**Description:** Secure Internet servers (per 1 million people). Secure servers are servers using encryption technology in Internet transactions.

**Unit:** Per 1 Million People

**Main source:** World Bank Data

## 5.6. Public Services

### 5.6.1. E-government Development Index (5a1)

**Description:** The E-Government Development Index (EGDI) is a weighted average of normalised scores on the three most important dimensions of e-government, namely: scope and quality of online services (Online Service Index, OSI), status of the development of telecommunication infrastructure (Telecommunication Infrastructure Index, TII) and inherent human capital (Human Capital Index, HCI).

**Unit:** Score of 0-1

**Main source:** UN E-Government Survey

### 5.6.2. Online Service Completion (5a2)

**Description:** To arrive at a set of Online Service Index (OSI) values for 2016, a total of 111 researchers, including UN experts and online United Nations Volunteers (UNVs) from over 60 countries with coverage of 66 languages assessed each country's national website in the native language, including the national portal, e-services portal and e-participation portal, as well as the websites of the related ministries of education, labour, social services, health, finance and environment as applicable.

**Unit:** Score of 0-1

**Main source:** UN E-Government Survey

### 5.6.3. Open Data (5a3)

**Description:** Data openness is evaluated based upon context, data, use and impact. The Global Open Data Index is intentionally narrowly focused on the data aspect, hence, limiting its inquiry only to the datasets publication by national governments. The measure assess the openness of data related to budget, spending, procurement, election results, company registers, land ownership, maps and boundaries, national statistics, legislation and laws, water and air quality.

**Unit:** Score of 0-100

**Main source:** Open Knowledge International Global Open Data Index



## 6. Annex 2 Maximum and minimum values used for normalisation

Indicator	Code	Minimum	Maximum
<b>1. Connectivity</b>			
Fixed Broadband Coverage	1a1	50	100
Fixed Broadband Take-up	1a2	30	100
Mobile Broadband Take-up	1b1	20	160
4G Coverage	1b2	0	100
NGA Coverage	1c1	0	80
Subscriptions to Fast Broadband	1c2	0	30
Fixed Broadband Price	1d1	0	1
<b>2. Human Capital</b>			
Internet Users	2a1	40	100
Regular Internet Users	2a2	40	100
Employed in knowledge-intensive activities	2b1	0	70
*Tertiary Graduates in ICT	2b2	0	60
<b>3. Citizen Internet Use</b>			
News	3a1	0	100
*Average number of devices used	3b1	0	5
<sup>a</sup> Social Networks	3b2	3	7
Banking	3c1	0	100
*Internet shoppers as a % of population	3c2	0	100
<b>4. Business Technology Integration</b>			
<sup>a</sup> Availability of latest technologies	4a1	3	7
<sup>a</sup> Firm-level technology absorption	4a2	3	7
Social Media	4a3	0	1
<sup>a</sup> Business to Business Internet use	4b1	3	7
*Secure Internet Servers	4b2	0	3500
<b>5. Public Services</b>			
*E-Government Development Index	5a1	0	100
Online Service Completion	5a2	40	100
Open Data	5a3	0	1

\* Indicates the inclusion of surrogate I-DESI indicators that do not perfectly align with EU28 DESI measures. Minimum and Maximum values have therefore been calculated from raw data.

<sup>a</sup> Indicates variables that had a range from 3 to 7.

## 7. Annex 3

### Performance scores for 45 countries

Chapter two compared aggregate performances of the 17 non-EU countries with EU28 Member States investigated in this study.

This annex provides details of the raw data scores of all 45 countries analysed between 2013 and 2016 (inclusive). The final column for each country provides the percentage change between 2013 and 2016 values (due to rounding these may not always correspond with values provided in the Annex).

The normalisation process in this study scaled data sets (often collected in different ways e.g. percentages, scores of 0 to 1 and scale of 1 to 7) into a range from 0 to 1. For ease of comparison these scores are usually converted into a scale of 0 to 100 in the main report.

**Table 5 Normalised scores for the main I-DESI index**

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.51</b>	<b>0.53</b>	<b>0.56</b>	<b>0.59</b>	<b>Non-EU avg.</b>	<b>0.50</b>	<b>0.53</b>	<b>0.56</b>	<b>0.59</b>
Austria	0.54	0.57	0.59	0.62	Australia	0.64	0.65	0.65	0.68
Belgium	0.53	0.57	0.58	0.63	Brazil	0.34	0.34	0.38	0.40
Bulgaria	0.35	0.38	0.39	0.48	Canada	0.58	0.62	0.64	0.67
Croatia	0.43	0.42	0.52	0.50	Chile	0.39	0.43	0.46	0.45
Cyprus	0.44	0.42	0.47	0.48	China	0.31	0.35	0.39	0.45
Czech Rep.	0.46	0.53	0.56	0.54	Iceland	0.67	0.74	0.76	0.73
Denmark	0.68	0.68	0.71	0.76	Israel	0.53	0.58	0.59	0.56
Estonia	0.62	0.61	0.66	0.66	Japan	0.52	0.60	0.62	0.68
Finland	0.65	0.66	0.72	0.74	Mexico	0.33	0.33	0.38	0.43
France	0.52	0.57	0.56	0.62	Norway	0.67	0.71	0.75	0.73
Germany	0.55	0.57	0.61	0.64	New Zealand	0.64	0.63	0.70	0.66
Greece	0.40	0.41	0.42	0.48	Russia	0.35	0.44	0.43	0.48
Hungary	0.42	0.45	0.49	0.56	Serbia	0.28	0.31	0.40	0.50
Ireland	0.54	0.59	0.64	0.63	South Korea	0.60	0.62	0.65	0.75
Italy	0.36	0.42	0.42	0.51	Switzerland	0.65	0.64	0.66	0.71
Latvia	0.46	0.50	0.54	0.51	Turkey	0.32	0.33	0.38	0.42
Lithuania	0.46	0.53	0.52	0.56	USA	0.59	0.64	0.65	0.67
Luxembourg	0.62	0.67	0.67	0.70					
Malta	0.58	0.56	0.62	0.58					
Netherlands	0.68	0.71	0.72	0.74					
Poland	0.39	0.42	0.44	0.49					
Portugal	0.44	0.46	0.48	0.49					
Romania	0.34	0.36	0.42	0.44					
Slovakia	0.43	0.46	0.50	0.53					
Slovenia	0.53	0.49	0.53	0.53					
Spain	0.46	0.52	0.54	0.63					
Sweden	0.66	0.68	0.70	0.72					
UK	0.65	0.68	0.69	0.73					

**Table 6 Normalised scores for the Connectivity Dimension**

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.46</b>	<b>0.53</b>	<b>0.60</b>	<b>0.63</b>	<b>Non-EU avg.</b>	<b>0.45</b>	<b>0.50</b>	<b>0.56</b>	<b>0.58</b>
Austria	0.44	0.54	0.59	0.63	Australia	0.49	0.54	0.54	0.57
Belgium	0.48	0.59	0.65	0.68	Brazil	0.31	0.34	0.40	0.40
Bulgaria	0.33	0.49	0.45	0.61	Canada	0.52	0.54	0.59	0.60
Croatia	0.37	0.43	0.60	0.54	Chile	0.31	0.39	0.43	0.48
Cyprus	0.44	0.44	0.56	0.54	China	0.23	0.35	0.42	0.46
Czech Rep.	0.40	0.60	0.66	0.67	Iceland	0.48	0.69	0.72	0.72
Denmark	0.56	0.64	0.70	0.77	Israel	0.47	0.44	0.50	0.54
Estonia	0.55	0.55	0.67	0.62	Japan	0.66	0.71	0.75	0.73
Finland	0.54	0.61	0.67	0.72	Mexico	0.28	0.31	0.39	0.45
France	0.51	0.51	0.55	0.59	Norway	0.51	0.62	0.74	0.76
Germany	0.48	0.55	0.63	0.64	New Zealand	0.43	0.48	0.58	0.55
Greece	0.36	0.45	0.51	0.50	Russia	0.36	0.46	0.49	0.39
Hungary	0.33	0.47	0.56	0.60	Serbia	0.26	0.27	0.43	0.52
Ireland	0.45	0.56	0.59	0.63	South Korea	0.68	0.75	0.76	0.80
Italy	0.39	0.46	0.50	0.51	Switzerland	0.61	0.66	0.70	0.79
Latvia	0.36	0.48	0.59	0.65	Turkey	0.36	0.30	0.34	0.43
Lithuania	0.37	0.55	0.53	0.61	USA	0.62	0.64	0.69	0.71
Luxembourg	0.52	0.67	0.71	0.65					
Malta	0.53	0.54	0.66	0.64					
Netherlands	0.60	0.68	0.73	0.75					
Poland	0.44	0.46	0.52	0.53					
Portugal	0.45	0.47	0.56	0.60					
Romania	0.44	0.49	0.53	0.61					
Slovakia	0.37	0.45	0.53	0.57					
Slovenia	0.48	0.51	0.58	0.60					
Spain	0.44	0.49	0.58	0.64					
Sweden	0.56	0.65	0.70	0.75					
UK	0.57	0.63	0.69	0.74					



**Table 7 Raw data scores for connectivity indicator 1a1**

Fixed broadband coverage (percentage of the population)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>89.5</b>	<b>96.3</b>	<b>96.4</b>	<b>96.8</b>	<b>Non-EU avg.</b>	<b>89.7</b>	<b>93.0</b>	<b>94.7</b>	<b>90.8</b>
Austria	NA	99.3	99.3	99.0	Australia	91.0	NA	82.0	NA
Belgium	NA	99.9	99.9	100.0	Brazil	NA	NA	NA	NA
Bulgaria	NA	95.1	95.2	95.0	Canada	98.0	NA	96.0	NA
Croatia	NA	96.6	96.9	97.0	Chile	NA	NA	NA	NA
Cyprus	NA	100.0	100.0	100.0	China	NA	91.0	NA	NA
Czech Rep.	NA	98.5	98.5	100.0	Iceland	NA	98.0	98.1	99.0
Denmark	NA	99.1	99.0	99.0	Israel	NA	74.0	NA	NA
Estonia	NA	86.0	86.8	91.0	Japan	NA	100.0	100.0	NA
Finland	NA	97.0	97.0	97.0	Mexico	NA	96.0	NA	NA
France	NA	99.7	99.8	100.0	Norway	NA	95.2	94.7	95.0
Germany	NA	97.9	98.3	99.0	New Zealand	NA	NA	NA	NA
Greece	NA	99.3	99.3	99.0	Russia	NA	96.5	NA	56.0
Hungary	NA	94.4	95.2	95.0	Serbia	NA	NA	NA	NA
Ireland	NA	96.3	96.3	96.0	South Korea	NA	95.5	NA	99.0
Italy	NA	99.1	99.3	99.0	Switzerland	NA	99.8	99.8	100.0
Latvia	NA	91.9	92.5	93.0	Turkey	NA	NA	NA	76.0
Lithuania	NA	95.4	95.7	96.0	USA	NA	96.0	97.0	100.0
Luxembourg	NA	100.0	100.0	100.0					
Malta	NA	100.0	100.0	100.0					
Netherlands	NA	100.0	100.0	100.0					
Poland	NA	85.4	86.2	86.0					
Portugal	NA	99.8	99.8	100.0					
Romania	NA	89.4	88.8	89.0					
Slovakia	NA	86.6	86.3	88.0					
Slovenia	NA	95.4	95.5	98.0					
Spain	NA	95.1	95.1	96.0					
Sweden	NA	99.0	99.0	99.0					
UK	NA	100.0	100.0	100.0					

**Table 8 Normalised\* average scores for connectivity indicator 1a2**

Fixed Broadband Take-up (Percentage of the population)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.52</b>	<b>0.55</b>	<b>0.58</b>	<b>0.60</b>	<b>Non-EU avg.</b>	<b>0.51</b>	<b>0.52</b>	<b>0.54</b>	<b>0.54</b>
Austria	0.41	0.48	0.51	0.54	Australia	0.54	0.61	0.65	0.57
Belgium	0.68	0.73	0.68	0.72	Brazil	0.09	0.14	0.17	0.20
Bulgaria	0.32	0.34	0.36	0.38	Canada	0.73	0.69	0.70	0.80
Croatia	0.44	0.45	0.58	0.57	Chile	0.28	0.33	0.39	0.44
Cyprus	0.47	0.54	0.56	0.60	China	0.27	0.30	0.58	0.41
Czech Rep.	0.51	0.66	0.66	0.58	Iceland	0.84	0.85	0.89	0.87
Denmark	0.73	0.70	0.67	0.76	Israel	0.85	0.67	0.43	0.53
Estonia	0.55	0.55	0.67	0.67	Japan	0.69	0.72	0.75	0.50
Finland	0.41	0.45	0.41	0.44	Mexico	0.24	0.25	0.33	0.39
France	0.66	0.62	0.58	0.61	Norway	0.82	0.85	0.88	0.68
Germany	0.73	0.76	0.77	0.79	New Zealand	0.69	0.75	0.78	0.57
Greece	0.35	0.47	0.51	0.52	Russia	0.22	0.26	0.31	0.34
Hungary	0.49	0.52	0.55	0.60	Serbia	0.14	0.16	0.23	0.29
Ireland	0.42	0.45	0.51	0.56	South Korea	0.44	0.60	0.46	0.68
Italy	0.29	0.30	0.32	0.36	Switzerland	0.79	0.68	0.65	0.84
Latvia	0.46	0.47	0.50	0.45	Turkey	0.32	0.30	0.35	0.42
Lithuania	0.40	0.41	0.43	0.47	USA	0.70	0.71	0.63	0.59
Luxembourg	0.56	0.87	0.92	0.94					
Malta	0.69	0.70	0.72	0.71					
Netherlands	0.92	0.93	0.91	0.93					
Poland	0.44	0.42	0.39	0.41					
Portugal	0.33	0.33	0.45	0.55					
Romania	0.36	0.35	0.43	0.47					
Slovakia	0.47	0.57	0.59	0.60					
Slovenia	0.60	0.59	0.64	0.67					
Spain	0.47	0.50	0.55	0.59					
Sweden	0.54	0.53	0.54	0.59					
UK	0.76	0.75	0.79	0.81					

\*Data can only be accessed through subscription with the ITU. Raw data is subject to copyright restrictions.

**Table 9 Normalised\* average scores for connectivity indicator 1b1**

Mobile Broadband Take-up (Subscriptions per 100 inhabitants)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.30</b>	<b>0.36</b>	<b>0.41</b>	<b>0.47</b>	<b>Non-EU avg.</b>	<b>0.33</b>	<b>0.40</b>	<b>0.48</b>	<b>0.51</b>
Austria	0.32	0.34	0.36	0.49	Australia	0.65	0.67	0.76	0.79
Belgium	0.23	0.27	0.30	0.33	Brazil	0.22	0.42	0.49	0.50
Bulgaria	0.27	0.33	0.44	0.49	Canada	0.21	0.24	0.30	0.33
Croatia	0.32	0.35	0.38	0.43	Chile	0.11	0.21	0.26	0.35
Cyprus	0.16	0.26	0.40	0.55	China	0.01	0.16	0.25	0.33
Czech Rep.	0.23	0.33	0.37	0.40	Iceland	0.39	0.47	0.52	0.60
Denmark	0.59	0.64	0.70	0.74	Israel	0.23	0.23	0.46	0.52
Estonia	0.53	0.69	0.66	0.75	Japan	0.69	0.74	0.77	0.80
Finland	0.74	0.85	0.89	0.95	Mexico	0.06	0.15	0.22	0.28
France	0.26	0.33	0.39	0.44	Norway	0.48	0.49	0.57	0.58
Germany	0.18	0.31	0.36	0.43	New Zealand	0.44	0.52	0.67	0.58
Greece	0.11	0.15	0.18	0.22	Russia	0.29	0.33	0.37	0.39
Hungary	0.05	0.10	0.14	0.17	Serbia	0.24	0.33	0.34	0.34
Ireland	0.34	0.44	0.54	0.56	South Korea	0.61	0.63	0.64	0.65
Italy	0.30	0.36	0.44	0.48	Switzerland	0.32	0.48	0.59	0.60
Latvia	0.30	0.29	0.34	0.41	Turkey	0.09	0.16	0.22	0.33
Lithuania	0.20	0.28	0.34	0.41	USA	0.56	0.59	0.68	0.71
Luxembourg	0.43	0.48	0.48	0.50					
Malta	0.26	0.26	0.30	0.37					
Netherlands	0.32	0.35	0.44	0.48					
Poland	0.25	0.25	0.27	0.28					
Portugal	0.12	0.18	0.23	0.29					
Romania	0.13	0.21	0.31	0.38					
Slovakia	0.21	0.28	0.34	0.42					
Slovenia	0.16	0.19	0.23	0.30					
Spain	0.33	0.41	0.45	0.48					
Sweden	0.64	0.69	0.73	0.75					
UK	0.48	0.49	0.48	0.51					

\*Data can only be accessed through subscription with the ITU. Raw data is subject to copyright restrictions.

**Table 10 Normalised\* average scores for connectivity indicator 1b2**

**4G Coverage (Percentage of the population)**

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.55</b>	<b>0.77</b>	<b>0.91</b>	<b>0.93</b>	<b>Non-EU avg.</b>	<b>0.56</b>	<b>0.66</b>	<b>0.77</b>	<b>0.87</b>
Austria	0.58	0.85	0.98	0.98	Australia	0.85	0.95	0.94	0.98
Belgium	0.52	0.88	1.00	1.00	Brazil	0.30	0.40	0.57	0.57
Bulgaria	0.00	0.35	0.57	0.87	Canada	0.81	0.93	0.97	NA
Croatia	0.23	0.45	0.98	0.97	Chile	0.35	0.64	0.76	0.79
Cyprus	NA	0.00	0.60	0.73	China	0.10	0.71	0.85	0.97
Czech Rep.	0.00	0.92	0.99	1.00	Iceland	0.68	0.89	0.93	0.96
Denmark	NA	1.00	1.00	1.00	Israel	NA	0.60	0.60	0.70
Estonia	0.97	1.00	1.00	0.99	Japan	0.99	0.99	0.99	0.99
Finland	0.79	0.95	1.00	1.00	Mexico	0.18	0.30	0.58	0.84
France	0.63	0.74	0.80	0.90	Norway	0.69	0.85	0.99	0.99
Germany	0.67	0.92	0.96	NA	New Zealand	NA	0.50	0.88	0.90
Greece	0.55	0.55	0.83	0.93	Russia	0.36	0.50	0.50	0.59
Hungary	0.38	0.78	0.97	0.98	Serbia	NA	0.00	0.57	0.78
Ireland	0.40	0.87	0.90	0.90	South Korea	NA	0.99	0.99	0.99
Italy	0.49	0.90	0.93	0.96	Switzerland	0.85	0.98	0.98	0.99
Latvia	0.39	0.75	0.90	0.99	Turkey	NA	0.00	0.00	0.83
Lithuania	0.49	0.80	0.91	0.98	USA	0.97	0.99	1.00	1.00
Luxembourg	0.90	0.93	0.96	NA					
Malta	0.30	0.62	1.00	1.00					
Netherlands	0.80	0.99	0.99	0.99					
Poland	0.67	0.80	1.00	NA					
Portugal	0.93	0.95	0.94	0.99					
Romania	0.59	0.68	0.66	0.75					
Slovakia	0.24	0.52	0.75	0.87					
Slovenia	0.63	0.90	0.96	0.97					
Spain	0.51	0.75	0.91	0.91					
Sweden	0.99	0.99	1.00	1.00					
UK	0.70	0.80	0.98	0.99					

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**Table 11 Raw data scores for connectivity indicator 1c1**

NGA Coverage (Percentage of connections above 15Mbps)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.11</b>	<b>0.16</b>	<b>0.25</b>	<b>0.30</b>	<b>Non-EU avg.</b>	<b>0.11</b>	<b>0.16</b>	<b>0.22</b>	<b>0.29</b>
Austria	NA	0.13	0.19	0.25	Australia	NA	0.07	0.08	0.16
Belgium	NA	0.19	0.32	0.40	Brazil	NA	0.01	0.01	0.05
Bulgaria	NA	NA	NA	0.39	Canada	NA	0.16	0.27	0.34
Croatia	NA	NA	NA	0.07	Chile	NA	0.01	0.03	0.13
Cyprus	NA	NA	NA	0.06	China	NA	0.02	0.00	0.02
Czech Rep.	NA	0.21	0.30	0.36	Iceland	NA	NA	NA	NA
Denmark	NA	0.21	0.38	0.49	Israel	NA	0.15	0.16	0.30
Estonia	NA	NA	NA	0.20	Japan	NA	0.34	0.40	0.51
Finland	NA	0.21	0.34	0.44	Mexico	NA	0.01	0.02	0.05
France	NA	0.06	0.11	0.16	Norway	NA	0.22	0.45	0.54
Germany	NA	0.09	0.23	0.30	New Zealand	NA	0.05	0.11	0.25
Greece	NA	NA	NA	0.05	Russia	NA	0.11	0.21	0.21
Hungary	NA	0.11	0.25	0.32	Serbia	NA	NA	NA	NA
Ireland	NA	0.16	0.25	0.38	South Korea	NA	0.61	0.63	0.64
Italy	NA	0.02	0.05	0.10	Switzerland	NA	0.30	0.38	0.54
Latvia	NA	NA	NA	0.41	Turkey	NA	0.04	0.03	0.07
Lithuania	NA	NA	NA	0.32	USA	NA	0.18	0.32	0.42
Luxembourg	NA	NA	NA	0.18					
Malta	NA	NA	NA	0.26					
Netherlands	NA	0.30	0.39	0.46					
Poland	NA	0.11	0.19	0.25					
Portugal	NA	0.10	0.26	0.28					
Romania	NA	0.23	0.28	0.44					
Slovakia	NA	0.10	0.20	0.23					
Slovenia	NA	NA	NA	0.25					
Spain	NA	0.10	0.24	0.36					
Sweden	NA	0.31	0.42	0.49					
UK	NA	0.22	0.32	0.39					

**Table 12 Raw Data scores for connectivity indicator 1c2**

Subscriptions to Fast Broadband (Average Mbps)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>8.5</b>	<b>10.3</b>	<b>13.0</b>	<b>14.2</b>	<b>Non-EU avg.</b>	<b>7.6</b>	<b>9.7</b>	<b>11.7</b>	<b>14.0</b>
Austria	9.0	9.8	12.3	13.9	Australia	5.8	7.4	8.2	10.1
Belgium	9.8	10.8	14.2	15.9	Brazil	2.7	3.0	4.1	6.4
Bulgaria	NA	NA	NA	15.6	Canada	9.0	10.7	13.1	14.9
Croatia	NA	NA	NA	8.2	Chile	3.4	5.0	6.1	8.6
Cyprus	NA	NA	NA	7.1	China	3.4	3.4	4.1	6.3
Czech Rep.	11.4	12.3	15.9	17.3	Iceland	7.4	NA	NA	NA
Denmark	9.5	11.9	16.1	20.7	Israel	NA	10.6	11.6	14.4
Estonia	NA	NA	NA	11.4	Japan	12.8	15.2	17.4	19.6
Finland	9.1	12.1	16.6	20.6	Mexico	4.0	4.5	5.9	7.2
France	6.6	7.1	8.9	10.0	Norway	8.7	11.4	18.8	23.6
Germany	7.7	8.8	12.9	14.6	New Zealand	5.3	7.3	9.3	12.9
Greece	4.9	NA	NA	7.5	Russia	7.4	9.0	11.6	11.6
Hungary	6.9	8.7	12.6	14.3	Serbia	NA	NA	NA	NA
Ireland	10.4	12.7	12.8	15.3	South Korea	21.9	22.2	26.7	26.1
Italy	5.2	5.6	7.4	8.7	Switzerland	12.0	14.5	16.7	21.2
Latvia	NA	NA	NA	17.2	Turkey	4.3	5.8	6.3	7.6
Lithuania	NA	NA	NA	14.6	USA	10.0	11.1	14.2	17.2
Luxembourg	6.5	NA	NA	11.1					
Malta	NA	NA	NA	12.9					
Netherlands	12.4	14.2	17.0	17.6					
Poland	7.5	8.8	11.0	12.4					
Portugal	6.0	8.0	12.1	12.6					
Romania	7.2	11.6	13.2	16.1					
Slovakia	6.6	8.2	12.5	13.0					
Slovenia	NA	NA	NA	14.0					
Spain	6.6	8.2	12.1	15.4					
Sweden	10.5	14.6	19.1	22.8					
UK	9.4	10.9	13.9	16.3					

**Table 13 Normalised\* average scores for connectivity indicator 1d1**

Fixed Broadband Price (Percentage of GNI per capita)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.70</b>	<b>0.70</b>	<b>0.75</b>	<b>0.74</b>	<b>Non-EU avg.</b>	<b>0.62</b>	<b>0.63</b>	<b>0.68</b>	<b>0.65</b>
Austria	0.79	0.79	0.81	0.82	Australia	0.52	0.42	0.67	0.51
Belgium	0.70	0.70	0.73	0.74	Brazil	0.65	0.68	0.77	0.54
Bulgaria	0.72	0.74	0.77	0.79	Canada	0.58	0.61	0.55	0.49
Croatia	0.67	0.58	0.74	0.74	Chile	0.29	0.50	0.55	0.52
Cyprus	0.71	0.71	0.77	0.77	China	0.37	0.42	0.47	0.59
Czech Rep.	0.71	0.78	0.82	0.83	Iceland	0.70	0.70	0.76	0.72
Denmark	0.61	0.63	0.70	0.72	Israel	0.57	0.61	0.63	0.65
Estonia	0.68	0.69	0.75	0.76	Japan	0.78	0.80	0.83	0.81
Finland	0.71	0.66	0.72	0.71	Mexico	0.68	0.39	0.49	0.58
France	0.72	0.73	0.78	0.78	Norway	0.70	0.69	0.75	0.75
Germany	0.66	0.61	0.68	0.69	New Zealand	0.29	0.40	0.50	0.37
Greece	0.64	0.65	0.71	0.71	Russia	0.90	0.87	0.89	0.89
Hungary	0.52	0.60	0.66	0.68	Serbia	0.45	0.47	0.58	0.60
Ireland	0.81	0.78	0.63	0.61	South Korea	0.67	0.66	0.66	0.62
Italy	0.70	0.68	0.70	0.54	Switzerland	0.76	0.76	0.78	0.75
Latvia	0.65	0.76	0.80	NA	Turkey	0.79	0.82	0.85	0.86
Lithuania	0.82	0.78	0.82	NA	USA	0.88	0.88	0.89	0.74
Luxembourg	0.76	0.77	0.81	0.74					
Malta	0.75	0.61	0.70	0.75					
Netherlands	0.71	0.65	0.71	0.69					
Poland	0.79	0.80	0.84	0.85					
Portugal	0.59	0.60	0.66	0.66					
Romania	0.82	0.83	0.87	0.88					
Slovakia	0.62	0.72	0.77	0.78					
Slovenia	0.66	0.67	0.73	0.59					
Spain	0.61	0.62	0.69	0.71					
Sweden	0.67	0.63	0.64	0.66					
UK	0.84	0.84	0.85	0.92					

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**Table 14 Normalised scores for the Human Capital Dimension**

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.52</b>	<b>0.53</b>	<b>0.55</b>	<b>0.58</b>	<b>Non-EU avg.</b>	<b>0.47</b>	<b>0.52</b>	<b>0.55</b>	<b>0.60</b>
Austria	0.61	0.55	0.57	0.59	Australia	0.69	0.69	0.72	0.81
Belgium	0.54	0.57	0.53	0.60	Brazil	0.20	0.24	0.32	0.39
Bulgaria	0.34	0.36	0.35	0.47	Canada	0.65	0.66	0.65	0.67
Croatia	0.46	0.45	0.50	0.45	Chile	0.26	0.36	0.43	0.43
Cyprus	0.42	0.44	0.45	0.45	China	0.31	0.37	0.49	0.41
Czech Rep.	0.55	0.55	0.53	0.58	Iceland	0.75	0.79	0.76	0.80
Denmark	0.72	0.74	0.77	0.80	Israel	0.54	0.68	0.61	0.57
Estonia	0.60	0.61	0.63	0.66	Japan	0.47	0.58	0.64	0.70
Finland	0.64	0.63	0.71	0.73	Mexico	0.21	0.23	0.28	0.42
France	0.52	0.53	0.56	0.62	Norway	0.70	0.72	0.70	0.69
Germany	0.58	0.55	0.62	0.62	New Zealand	0.80	0.75	0.83	0.79
Greece	0.38	0.40	0.37	0.48	Russia	0.38	0.52	0.46	0.64
Hungary	0.45	0.46	0.46	0.62	Serbia	0.26	0.34	0.39	0.44
Ireland	0.64	0.70	0.74	0.77	South Korea	0.50	0.51	0.58	0.76
Italy	0.34	0.35	0.37	0.50	Switzerland	0.63	0.65	0.62	0.65
Latvia	0.52	0.52	0.56	0.47	Turkey	0.12	0.23	0.42	0.53
Lithuania	0.49	0.50	0.47	0.53	USA	0.52	0.53	0.53	0.56
Luxembourg	0.67	0.67	0.68	0.67					
Malta	0.64	0.66	0.66	0.48					
Netherlands	0.68	0.69	0.76	0.69					
Poland	0.50	0.50	0.50	0.53					
Portugal	0.33	0.37	0.35	0.43					
Romania	0.23	0.25	0.37	0.43					
Slovakia	0.53	0.53	0.54	0.65					
Slovenia	0.54	0.52	0.51	0.44					
Spain	0.44	0.48	0.50	0.62					
Sweden	0.66	0.70	0.64	0.69					
UK	0.65	0.66	0.64	0.65					



**Table 15 Raw data scores for human capital indicator 2a1**

Internet Users (Percentage of individuals using the internet)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.77</b>	<b>0.79</b>	<b>0.79</b>	<b>0.81</b>	<b>Non-EU avg.</b>	<b>0.74</b>	<b>0.77</b>	<b>0.78</b>	<b>0.81</b>
Austria	0.80	0.81	0.83	0.83	Australia	0.89	0.88	0.88	0.90
Belgium	0.78	0.82	0.78	0.82	Brazil	0.49	0.48	0.56	0.64
Bulgaria	0.66	0.69	0.69	0.71	Canada	0.82	0.84	NA	0.85
Croatia	0.70	0.74	0.73	0.72	Chile	NA	NA	NA	0.73
Cyprus	NA	NA	NA	NA	China	0.61	0.70	0.73	0.77
Czech Rep.	0.80	0.82	0.80	0.81	Iceland	NA	NA	NA	NA
Denmark	0.89	0.92	0.90	0.92	Israel	0.86	0.84	0.84	0.86
Estonia	0.77	0.77	0.76	0.81	Japan	0.83	0.86	0.85	0.83
Finland	0.85	0.86	0.88	0.90	Mexico	0.61	0.67	0.63	0.70
France	0.73	0.75	0.80	0.83	Norway	0.96	0.94	0.94	0.93
Germany	0.81	0.82	0.83	0.82	New Zealand	0.90	0.89	0.89	0.89
Greece	0.60	0.64	0.66	0.72	Russia	NA	NA	NA	0.73
Hungary	0.71	0.71	0.73	0.82	Serbia	0.52	0.58	0.59	0.69
Ireland	0.89	0.86	0.87	0.88	South Korea	0.79	0.79	0.83	0.91
Italy	0.70	0.75	0.77	0.77	Switzerland	0.85	0.88	0.85	0.88
Latvia	0.73	0.76	0.75	0.76	Turkey	0.45	0.56	0.66	0.75
Lithuania	0.71	0.74	0.72	0.77	USA	0.82	0.79	0.81	0.81
Luxembourg	NA	NA	NA	NA					
Malta	NA	NA	NA	NA					
Netherlands	0.92	0.95	0.94	0.93					
Poland	0.77	0.74	0.74	0.78					
Portugal	0.63	0.68	0.65	0.71					
Romania	0.62	0.64	0.65	0.66					
Slovakia	0.86	0.84	0.84	0.84					
Slovenia	0.83	0.78	0.76	0.75					
Spain	0.74	0.77	0.78	0.81					
Sweden	0.89	0.90	0.93	0.94					
UK	0.82	0.82	0.81	0.83					

**Table 16 Normalised\* average scores for human capital indicator 2a2**

Regular Internet Users (Percentage of population)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.59</b>	<b>0.61</b>	<b>0.63</b>	<b>0.67</b>	<b>Non-EU avg.</b>	<b>0.52</b>	<b>0.56</b>	<b>0.61</b>	<b>0.64</b>
Austria	0.68	0.68	0.73	0.74	Australia	0.72	0.73	0.74	0.80
Belgium	0.70	0.75	0.75	0.78	Brazil	0.18	0.24	0.31	0.33
Bulgaria	0.22	0.26	0.28	0.33	Canada	0.76	0.79	0.81	0.83
Croatia	0.45	0.48	0.50	0.54	Chile	0.30	0.35	0.40	0.43
Cyprus	0.42	0.49	0.53	0.60	China	0.10	0.13	0.17	0.22
Czech Rep.	0.57	0.57	0.59	0.61	Iceland	0.94	0.97	0.97	0.97
Denmark	0.91	0.93	0.94	0.95	Israel	0.50	0.58	0.62	0.66
Estonia	0.67	0.74	0.81	0.79	Japan	0.80	0.82	0.85	0.87
Finland	0.86	0.78	0.77	0.80	Mexico	0.06	0.07	0.29	0.33
France	0.70	0.73	0.74	0.76	Norway	0.92	0.94	0.95	0.95
Germany	0.74	0.77	0.79	0.83	New Zealand	0.71	0.76	0.80	0.81
Greece	0.33	0.39	0.45	0.48	Russia	0.47	0.51	0.56	0.61
Hungary	0.54	0.59	0.55	0.65	Serbia	0.22	0.37	0.42	0.45
Ireland	0.64	0.66	0.67	0.70	South Korea	0.75	0.79	0.83	0.88
Italy	0.31	0.26	0.30	0.36	Switzerland	0.77	0.79	0.79	0.82
Latvia	0.59	0.60	0.65	0.66	Turkey	0.10	0.18	0.23	0.31
Lithuania	0.47	0.54	0.52	0.57	USA	0.52	0.55	0.58	0.60
Luxembourg	0.90	0.91	0.96	0.96					
Malta	0.48	0.55	0.60	0.62					
Netherlands	0.90	0.86	0.86	0.84					
Poland	0.38	0.44	0.47	0.56					
Portugal	0.37	0.41	0.48	0.51					
Romania	0.16	0.23	0.26	0.33					
Slovakia	0.63	0.67	0.63	0.67					
Slovenia	0.54	0.53	0.55	0.59					
Spain	0.53	0.60	0.64	0.68					
Sweden	0.91	0.88	0.84	0.86					
UK	0.83	0.86	0.87	0.91					

\*Data can only be accessed through subscription with the ITU. Raw data is subject to copyright restrictions.

**Table 17 Raw Data scores for human capital indicator 2b1**

Employed in knowledge-intensive activities (Percentage of workforce)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>39.5</b>	<b>39.9</b>	<b>40.8</b>	<b>42.0</b>	<b>Non-EU avg.</b>	<b>34.8</b>	<b>34.8</b>	<b>39.6</b>	<b>38.8</b>
Austria	39.8	40.4	NA	NA	Australia	43.8	44.9	NA	NA
Belgium	44.4	46.2	NA	NA	Brazil	21.0	21.6	NA	NA
Bulgaria	31.0	31.9	NA	NA	Canada	44.2	43.7	NA	NA
Croatia	35.1	35.7	NA	NA	Chile	24.3	24.8	NA	NA
Cyprus	35.1	35.8	NA	NA	China	NA	NA	NA	NA
Czech Rep.	37.8	37.9	NA	NA	Iceland	49.3	48.2	NA	NA
Denmark	45.5	45.3	NA	NA	Israel	46.5	47.7	NA	NA
Estonia	41.8	42.7	NA	NA	Japan	24.3	24.4	NA	NA
Finland	44.7	45.2	NA	NA	Mexico	19.1	19.5	NA	NA
France	44.3	44.0	NA	NA	Norway	46.8	50.7	NA	NA
Germany	42.9	43.5	NA	NA	New Zealand	NA	NA	NA	NA
Greece	32.3	30.6	NA	NA	Russia	43.6	44.2	NA	NA
Hungary	35.6	35.3	NA	NA	Serbia	28.1	29.1	NA	NA
Ireland	40.5	40.3	NA	NA	South Korea	21.4	21.6	NA	NA
Italy	35.1	35.6	NA	NA	Switzerland	51.0	52.1	NA	NA
Latvia	39.2	39.6	NA	NA	Turkey	19.2	19.7	NA	NA
Lithuania	42.8	42.6	NA	NA	USA	38.0	NA	NA	NA
Luxembourg	59.1	62.3	NA	NA					
Malta	40.6	39.3	NA	NA					
Netherlands	46.4	46.4	NA	NA					
Poland	35.9	36.8	NA	NA					
Portugal	32.5	34.8	NA	NA					
Romania	21.2	21.5	NA	NA					
Slovakia	31.8	31.9	NA	NA					
Slovenia	42.2	41.7	NA	NA					
Spain	33.2	33.1	NA	NA					
Sweden	48.5	49.4	NA	NA					
UK	47.7	47.4	NA	NA					

**Table 18 Raw data scores for human capital indicator 2b2**

Tertiary Graduates in ICT (Percentage of graduates)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.19</b>	<b>0.18</b>	<b>0.20</b>	<b>0.22</b>	<b>Non-EU avg.</b>	<b>0.18</b>	<b>0.25</b>	<b>0.25</b>	<b>0.32</b>
Austria	NA	NA	0.14	NA	Australia	NA	NA	0.35	NA
Belgium	NA	NA	0.11	NA	Brazil	NA	NA	0.18	NA
Bulgaria	NA	NA	NA	NA	Canada	NA	NA	0.29	NA
Croatia	NA	NA	NA	NA	Chile	NA	NA	0.20	NA
Cyprus	NA	NA	NA	NA	China	NA	NA	NA	NA
Czech Rep.	NA	NA	0.19	NA	Iceland	NA	NA	NA	NA
Denmark	NA	NA	0.33	NA	Israel	NA	NA	NA	NA
Estonia	NA	NA	0.26	NA	Japan	NA	NA	NA	NA
Finland	NA	NA	0.45	NA	Mexico	NA	NA	0.06	NA
France	NA	NA	0.11	NA	Norway	NA	NA	0.18	NA
Germany	NA	NA	0.16	NA	New Zealand	NA	NA	0.59	NA
Greece	NA	NA	NA	NA	Russia	NA	NA	0.07	NA
Hungary	NA	NA	0.11	NA	Serbia	NA	NA	NA	NA
Ireland	NA	NA	0.57	NA	South Korea	NA	NA	0.15	NA
Italy	NA	NA	0.10	NA	Switzerland	NA	NA	0.16	NA
Latvia	NA	NA	0.19	NA	Turkey	NA	NA	0.24	NA
Lithuania	NA	NA	0.15	NA	USA	NA	NA	0.22	NA
Luxembourg	NA	NA	0.05	NA					
Malta	NA	NA	0.41	NA					
Netherlands	NA	NA	0.31	NA					
Poland	NA	NA	0.27	NA					
Portugal	NA	NA	0.05	NA					
Romania	NA	NA	0.21	NA					
Slovakia	NA	NA	0.15	NA					
Slovenia	NA	NA	0.17	NA					
Spain	NA	NA	0.15	NA					
Sweden	NA	NA	0.13	NA					
UK	NA	NA	0.22	NA					

**Table 19 Normalised scores for Citizen Internet Use Dimension**

	2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.51</b>	<b>0.55</b>	<b>0.56</b>	<b>0.60</b>
Austria	0.50	0.57	0.55	0.60
Belgium	0.59	0.59	0.58	0.62
Bulgaria	0.29	0.39	0.38	0.42
Croatia	0.41	0.47	0.50	0.49
Cyprus	0.40	0.40	0.45	0.54
Czech Rep.	0.54	0.61	0.60	0.58
Denmark	0.68	0.74	0.71	0.79
Estonia	0.65	0.67	0.74	0.70
Finland	0.75	0.71	0.76	0.78
France	0.50	0.49	0.52	0.59
Germany	0.54	0.58	0.59	0.66
Greece	0.35	0.41	0.44	0.46
Hungary	0.43	0.49	0.50	0.55
Ireland	0.46	0.52	0.55	0.56
Italy	0.38	0.39	0.39	0.42
Latvia	0.52	0.56	0.61	0.58
Lithuania	0.52	0.57	0.58	0.58
Luxembourg	0.68	0.73	0.72	0.79
Malta	0.56	0.60	0.55	0.57
Netherlands	0.71	0.72	0.71	0.76
Poland	0.36	0.44	0.44	0.51
Portugal	0.40	0.44	0.47	0.47
Romania	0.26	0.38	0.42	0.48
Slovakia	0.46	0.52	0.50	0.59
Slovenia	0.52	0.50	0.49	0.53
Spain	0.49	0.54	0.56	0.58
Sweden	0.74	0.78	0.75	0.78
UK	0.67	0.67	0.71	0.72

	2013	2014	2015	2016
<b>Non-EU avg.</b>	<b>0.50</b>	<b>0.51</b>	<b>0.53</b>	<b>0.57</b>
Australia	0.74	0.70	0.69	0.58
Brazil	0.27	0.32	0.32	0.34
Canada	0.56	0.58	0.61	0.66
Chile	0.26	0.34	0.33	0.33
China	0.25	0.29	0.23	0.45
Iceland	0.78	0.84	0.86	0.76
Israel	0.53	0.57	0.63	0.59
Japan	0.40	0.44	0.48	0.74
Mexico	0.35	0.33	0.27	0.30
Norway	0.80	0.84	0.84	0.85
New Zealand	0.62	0.54	0.65	0.58
Russia	0.42	0.37	0.46	0.49
Serbia	0.18	0.38	0.38	0.50
South Korea	0.62	0.59	0.63	0.74
Switzerland	0.76	0.64	0.67	0.78
Turkey	0.29	0.33	0.34	0.36
USA	0.63	0.61	0.66	0.71

**Table 20 Raw data scores for citizen Internet use indicator 3a1**

View news online (Percentage of individuals)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.51</b>	<b>0.57</b>	<b>0.59</b>	<b>0.63</b>	<b>Non-EU avg.</b>	<b>0.50</b>	<b>0.50</b>	<b>0.55</b>	<b>0.59</b>
Austria	0.41	0.54	0.57	0.56	Australia	NA	NA	NA	NA
Belgium	NA	0.53	0.52	0.56	Brazil	0.23	0.31	0.31	0.31
Bulgaria	NA	NA	NA	NA	Canada	NA	NA	NA	NA
Croatia	NA	NA	NA	NA	Chile	0.15	0.19	0.19	NA
Cyprus	NA	NA	NA	NA	China	NA	NA	NA	NA
Czech Rep.	0.63	0.69	0.70	0.67	Iceland	0.83	0.93	NA	NA
Denmark	0.70	0.71	0.66	0.70	Israel	NA	NA	NA	NA
Estonia	0.73	0.76	0.80	0.78	Japan	0.38	0.44	0.46	NA
Finland	0.79	0.78	0.82	0.80	Mexico	0.14	0.15	0.26	0.28
France	0.41	0.39	0.42	0.48	Norway	0.87	0.89	0.90	0.92
Germany	0.57	0.61	0.63	0.64	New Zealand	NA	NA	NA	NA
Greece	0.46	0.54	0.57	0.59	Russia	NA	NA	NA	NA
Hungary	0.60	0.65	0.62	0.70	Serbia	NA	NA	NA	NA
Ireland	0.33	0.37	0.38	0.41	South Korea	0.78	0.73	0.81	NA
Italy	0.40	0.37	0.37	0.41	Switzerland	NA	0.68	NA	NA
Latvia	0.64	0.65	0.69	0.67	Turkey	0.33	0.36	0.36	0.41
Lithuania	0.62	0.68	0.67	0.69	USA	NA	NA	NA	NA
Luxembourg	0.77	0.81	0.82	0.87					
Malta	NA	NA	NA	NA					
Netherlands	0.56	0.57	0.55	0.70					
Poland	0.27	0.47	0.47	0.58					
Portugal	0.45	0.48	0.53	0.55					
Romania	NA	NA	NA	NA					
Slovakia	0.43	0.52	0.51	0.59					
Slovenia	0.57	0.58	0.56	0.60					
Spain	0.50	0.59	0.62	0.63					
Sweden	0.80	0.82	0.76	0.81					
UK	0.58	0.59	0.65	0.64					

**Table 21 Raw data scores for citizen Internet use indicator 3b1**

Social Networks use (Score of 1-7)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>5.98</b>	<b>6.08</b>	<b>5.94</b>	<b>6.08</b>	<b>Non-EU avg.</b>	<b>5.95</b>	<b>6.06</b>	<b>5.96</b>	<b>5.98</b>
Austria	6.23	6.24	5.82	NA	Australia	6.39	6.40	6.03	NA
Belgium	6.13	6.23	6.13	NA	Brazil	6.03	6.00	5.85	NA
Bulgaria	5.56	5.97	5.69	NA	Canada	6.34	6.40	6.23	NA
Croatia	5.62	5.91	5.42	NA	Chile	6.14	6.14	5.92	NA
Cyprus	5.99	6.07	5.92	NA	China	4.73	4.68	4.72	NA
Czech Rep.	5.98	5.97	5.90	NA	Iceland	6.67	6.79	6.68	NA
Denmark	5.93	6.12	6.17	NA	Israel	6.08	6.18	6.35	NA
Estonia	6.41	6.50	6.28	NA	Japan	5.72	5.89	5.88	NA
Finland	6.43	6.36	6.36	NA	Mexico	5.44	5.32	5.36	NA
France	5.87	5.78	5.87	NA	Norway	6.58	6.68	6.57	NA
Germany	5.87	5.89	5.77	NA	New Zealand	6.25	6.35	6.18	NA
Greece	5.40	5.46	5.31	NA	Russia	5.40	5.63	5.63	NA
Hungary	5.57	5.75	5.37	NA	Serbia	5.02	5.80	5.62	NA
Ireland	6.12	6.25	6.23	NA	South Korea	5.87	5.97	5.90	NA
Italy	5.79	6.04	5.97	NA	Switzerland	6.19	6.22	6.05	NA
Latvia	5.87	6.13	6.09	NA	Turkey	5.84	6.01	5.80	NA
Lithuania	6.23	6.44	6.37	NA	USA	6.39	6.54	6.57	NA
Luxembourg	6.11	6.13	6.23	NA					
Malta	6.43	6.41	6.08	NA					
Netherlands	6.57	6.60	6.57	NA					
Poland	5.06	5.34	5.20	NA					
Portugal	5.90	6.00	5.87	NA					
Romania	5.48	5.62	5.62	NA					
Slovakia	5.86	5.91	5.71	NA					
Slovenia	5.81	6.03	5.81	NA					
Spain	5.92	5.89	5.59	NA					
Sweden	6.54	6.48	6.47	NA					
UK	6.63	6.64	6.53	NA					

**Table 22 Raw data scores for citizen Internet use indicator 3c1**

Banking online use (Percentage of population)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>47.3</b>	<b>48.9</b>	<b>48.9</b>	<b>51.8</b>	<b>Non-EU avg.</b>	<b>44.8</b>	<b>43.7</b>	<b>42.0</b>	<b>53.0</b>
Austria	48.6	48.0	51.0	53.3	Australia	NA	65.5	NA	NA
Belgium	57.8	61.2	62.3	64.5	Brazil	13.8	15.0	16.6	NA
Bulgaria	NA	NA	NA	NA	Canada	NA	NA	NA	NA
Croatia	NA	NA	NA	NA	Chile	9.4	21.6	21.7	14.0
Cyprus	NA	NA	NA	NA	China	NA	NA	NA	NA
Czech Rep.	41.5	46.1	48.4	51.4	Iceland	86.7	91.4	NA	NA
Denmark	82.5	84.3	84.9	87.9	Israel	29.2	NA	40.6	42.6
Estonia	72.2	76.6	80.7	78.6	Japan	9.2	11.0	11.0	NA
Finland	84.4	85.6	85.7	86.4	Mexico	90.0	81.0	7.0	7.6
France	57.6	57.6	58.3	59.4	Norway	86.8	89.2	90.4	91.2
Germany	47.1	48.8	51.0	53.0	New Zealand	64.0	NA	NA	NA
Greece	10.7	13.1	13.9	19.2	Russia	NA	NA	NA	NA
Hungary	26.9	30.5	33.8	35.3	Serbia	NA	NA	NA	NA
Ireland	45.6	48.1	51.5	52.3	South Korea	41.4	46.4	48.5	NA
Italy	21.7	26.1	28.1	29.0	Switzerland	NA	54.3	NA	NA
Latvia	54.9	56.8	64.3	62.1	Turkey	10.7	13.7	15.0	18.1
Lithuania	46.4	53.6	50.2	54.2	USA	39.0	NA	52.3	NA
Luxembourg	62.9	66.5	65.1	70.9					
Malta	NA	NA	NA	NA					
Netherlands	82.0	83.4	84.5	84.7					
Poland	32.0	32.6	31.2	39.1					
Portugal	22.6	25.3	28.2	28.9					
Romania	NA	NA	NA	NA					
Slovakia	38.7	40.6	37.3	45.4					
Slovenia	32.3	32.3	33.7	35.2					
Spain	32.9	37.4	39.4	43.2					
Sweden	81.8	81.7	79.6	83.2					
UK	54.0	56.9	58.4	64.2					



**Table 23 Raw data scores for citizen Internet use indicator 3c2**

Internet Shoppers (Percentage of population)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.37</b>	<b>0.44</b>	<b>0.47</b>	<b>0.50</b>	<b>Non-EU avg.</b>	<b>0.36</b>	<b>0.41</b>	<b>0.42</b>	<b>0.44</b>
Austria	NA	0.53	0.41	0.57	Australia	0.63	NA	NA	NA
Belgium	NA	0.54	0.46	0.57	Brazil	NA	0.19	0.09	0.23
Bulgaria	NA	0.15	NA	0.17	Canada	NA	NA	NA	NA
Croatia	NA	0.28	NA	0.33	Chile	NA	0.26	0.24	NA
Cyprus	NA	0.26	NA	0.29	China	NA	0.27	NA	0.34
Czech Rep.	NA	NA	0.50	0.47	Iceland	NA	0.67	NA	NA
Denmark	NA	0.78	0.70	0.81	Israel	0.30	NA	0.40	0.31
Estonia	NA	0.48	0.72	0.56	Japan	NA	0.47	0.65	NA
Finland	NA	0.49	0.64	0.68	Mexico	NA	0.02	0.06	NA
France	NA	0.43	0.49	0.65	Norway	NA	0.76	0.77	0.77
Germany	NA	0.60	0.56	0.74	New Zealand	NA	NA	NA	NA
Greece	NA	0.25	0.36	0.31	Russia	NA	0.24	NA	0.25
Hungary	NA	0.32	0.40	0.38	Serbia	NA	0.20	NA	NA
Ireland	NA	0.50	0.57	0.58	South Korea	NA	0.43	0.46	NA
Italy	NA	0.20	0.20	0.28	Switzerland	NA	0.56	NA	NA
Latvia	NA	0.33	0.40	0.45	Turkey	NA	0.17	0.12	0.17
Lithuania	NA	0.26	0.31	0.33	USA	0.69	NA	0.67	NA
Luxembourg	NA	0.73	0.68	0.78					
Malta	NA	0.46	NA	0.48					
Netherlands	NA	0.72	0.73	0.73					
Poland	NA	0.33	0.35	0.41					
Portugal	NA	0.25	0.29	0.30					
Romania	NA	0.09	NA	0.12					
Slovakia	NA	0.46	0.41	0.54					
Slovenia	NA	0.36	0.34	0.40					
Spain	NA	0.37	0.46	0.44					
Sweden	NA	0.70	0.65	0.74					
UK	NA	0.74	0.82	0.77					

**Table 24 Raw data scores for citizen Internet use indicator 3d1**

Average number of devices used (Devices)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>2.3</b>	<b>2.4</b>	<b>2.6</b>	<b>2.7</b>	<b>Non-EU avg.</b>	<b>2.2</b>	<b>2.3</b>	<b>2.5</b>	<b>2.7</b>
Austria	2.5	2.6	2.7	2.8	Australia	3.3	3.1	3.1	3.3
Belgium	2.2	2.5	2.7	2.7	Brazil	1.1	1.1	1.5	1.8
Bulgaria	1.7	1.9	2.2	2.3	Canada	2.9	3.0	NA	3.2
Croatia	2.0	2.2	2.5	2.6	Chile	NA	NA	NA	2.1
Cyprus	NA	NA	NA	NA	China	1.4	1.9	1.9	2.1
Czech Rep.	2.5	2.4	2.5	2.5	Iceland	NA	NA	NA	NA
Denmark	2.8	3.2	3.1	3.6	Israel	2.8	2.7	2.9	3.0
Estonia	2.1	2.1	2.5	2.5	Japan	1.8	2.3	2.4	3.0
Finland	2.5	2.7	3.0	3.1	Mexico	1.3	1.4	1.8	2.1
France	2.3	2.2	2.5	2.8	Norway	3.3	3.4	3.5	3.5
Germany	2.2	2.4	2.6	2.8	New Zealand	2.8	2.7	3.0	3.2
Greece	1.7	1.9	2.1	2.1	Russia	NA	NA	NA	2.1
Hungary	1.8	1.6	2.0	2.5	Serbia	1.1	1.6	1.9	1.8
Ireland	2.7	3.1	3.2	3.2	South Korea	2.8	2.3	2.5	2.8
Italy	2.0	2.0	2.0	2.3	Switzerland	2.8	2.8	3.1	3.4
Latvia	1.9	2.0	2.3	2.3	Turkey	0.8	1.0	1.6	2.0
Lithuania	1.9	2.1	2.4	2.4	USA	2.9	3.1	3.2	3.5
Luxembourg	NA	NA	NA	NA					
Malta	NA	NA	NA	NA					
Netherlands	3.1	3.6	3.6	3.5					
Poland	2.2	2.2	2.6	2.7					
Portugal	1.7	2.1	2.3	2.3					
Romania	1.6	1.7	1.9	2.1					
Slovakia	2.6	2.4	2.6	3.0					
Slovenia	2.4	2.1	2.2	2.4					
Spain	2.5	2.9	3.0	3.0					
Sweden	2.9	3.2	3.4	3.4					
UK	3.0	3.1	3.3	3.4					

**Table 25 Normalised scores for Business Technology Integration Dimension**

	2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.48</b>	<b>0.49</b>	<b>0.50</b>	<b>0.51</b>
Austria	0.58	0.58	0.60	0.59
Belgium	0.54	0.56	0.57	0.61
Bulgaria	0.29	0.33	0.31	0.36
Croatia	0.37	0.37	0.34	0.46
Cyprus	0.47	0.47	0.42	0.39
Czech Rep.	0.41	0.44	0.45	0.39
Denmark	0.62	0.62	0.64	0.71
Estonia	0.51	0.53	0.54	0.53
Finland	0.65	0.67	0.67	0.67
France	0.47	0.50	0.50	0.53
Germany	0.57	0.57	0.61	0.59
Greece	0.32	0.33	0.33	0.45
Hungary	0.38	0.40	0.37	0.51
Ireland	0.54	0.56	0.58	0.51
Italy	0.29	0.30	0.33	0.47
Latvia	0.36	0.40	0.44	0.32
Lithuania	0.49	0.50	0.49	0.46
Luxembourg	0.64	0.68	0.69	0.77
Malta	0.60	0.56	0.56	0.57
Netherlands	0.68	0.71	0.72	0.75
Poland	0.26	0.27	0.29	0.33
Portugal	0.50	0.52	0.50	0.39
Romania	0.26	0.28	0.30	0.27
Slovakia	0.37	0.41	0.43	0.40
Slovenia	0.45	0.45	0.46	0.43
Spain	0.45	0.42	0.42	0.55
Sweden	0.67	0.65	0.67	0.65
UK	0.61	0.63	0.65	0.68

	2013	2014	2015	2016
<b>Non-EU avg.</b>	<b>0.50</b>	<b>0.51</b>	<b>0.51</b>	<b>0.51</b>
Australia	0.58	0.58	0.59	0.57
Brazil	0.39	0.35	0.35	0.28
Canada	0.55	0.59	0.57	0.65
Chile	0.47	0.47	0.43	0.41
China	0.29	0.31	0.31	0.41
Iceland	0.75	0.78	0.78	0.76
Israel	0.55	0.55	0.59	0.45
Japan	0.54	0.56	0.57	0.53
Mexico	0.34	0.32	0.34	0.34
Norway	0.67	0.69	0.71	0.66
New Zealand	0.59	0.61	0.60	0.56
Russia	0.18	0.28	0.27	0.30
Serbia	0.20	0.25	0.23	0.44
South Korea	0.63	0.59	0.60	0.64
Switzerland	0.68	0.73	0.73	0.80
Turkey	0.42	0.41	0.39	0.28
USA	0.61	0.64	0.69	0.62

**Table 26 Raw data scores for business technology integration indicator 4a1**

Availability of latest technologies (Score of 1-7)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>5.67</b>	<b>5.66</b>	<b>5.67</b>	<b>5.74</b>	<b>Non-EU avg.</b>	<b>5.66</b>	<b>5.63</b>	<b>5.57</b>	<b>5.57</b>
Austria	6.05	6.03	6.09	NA	Australia	6.06	5.98	5.91	NA
Belgium	6.32	6.27	6.19	NA	Brazil	5.05	4.71	4.47	NA
Bulgaria	4.45	4.44	4.64	NA	Canada	6.12	6.20	6.24	NA
Croatia	5.15	5.06	4.97	NA	Chile	5.80	5.72	5.59	NA
Cyprus	5.52	5.41	5.17	NA	China	4.36	4.35	4.30	NA
Czech Rep.	5.21	5.21	5.63	NA	Iceland	6.40	6.43	6.42	NA
Denmark	5.90	5.81	5.97	NA	Israel	6.19	6.28	6.36	NA
Estonia	5.76	5.83	5.77	NA	Japan	6.28	6.22	6.16	NA
Finland	6.55	6.61	6.60	NA	Mexico	5.11	4.91	4.95	NA
France	6.14	6.09	6.05	NA	Norway	6.48	6.49	6.51	NA
Germany	6.29	6.19	6.22	NA	New Zealand	6.08	6.06	5.89	NA
Greece	5.02	5.03	4.99	NA	Russia	3.97	4.22	4.22	NA
Hungary	5.18	5.34	5.15	NA	Serbia	4.07	4.24	4.04	NA
Ireland	5.90	6.03	6.11	NA	South Korea	5.93	5.74	5.64	NA
Italy	5.01	4.96	5.10	NA	Switzerland	6.44	6.40	6.42	NA
Latvia	5.34	5.66	5.77	NA	Turkey	5.42	5.31	5.00	NA
Lithuania	5.68	5.72	5.76	NA	USA	6.43	6.51	6.54	NA
Luxembourg	6.34	6.23	6.20	NA					
Malta	6.07	5.71	5.35	NA					
Netherlands	6.35	6.29	6.30	NA					
Poland	4.43	4.45	4.64	NA					
Portugal	6.24	6.27	6.10	NA					
Romania	4.30	4.63	4.65	NA					
Slovakia	4.98	5.22	5.47	NA					
Slovenia	5.64	5.49	5.47	NA					
Spain	5.81	5.60	5.52	NA					
Sweden	6.53	6.35	6.48	NA					
UK	6.44	6.45	6.48	NA					

**Table 27 Raw data scores for business technology integration indicator 4a2**

Firm-level technology absorption (Score of 1-7)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>5.18</b>	<b>5.18</b>	<b>5.18</b>	<b>5.23</b>	<b>Non-EU avg.</b>	<b>5.39</b>	<b>5.37</b>	<b>5.37</b>	<b>5.24</b>
Austria	5.76	5.68	5.68	NA	Australia	5.82	5.61	5.61	NA
Belgium	5.59	5.64	5.64	NA	Brazil	5.00	4.77	4.77	NA
Bulgaria	4.16	4.39	4.39	NA	Canada	5.45	5.43	5.43	NA
Croatia	4.65	4.55	4.55	NA	Chile	5.10	5.20	5.20	NA
Cyprus	5.24	5.14	5.14	NA	China	4.69	4.66	4.66	NA
Czech Rep.	4.95	4.95	4.95	NA	Iceland	6.19	6.17	6.17	NA
Denmark	5.72	5.71	5.71	NA	Israel	6.07	6.05	6.05	NA
Estonia	5.38	5.39	5.39	NA	Japan	6.06	6.08	6.08	NA
Finland	6.03	5.84	5.84	NA	Mexico	4.76	4.60	4.60	NA
France	5.46	5.45	5.45	NA	Norway	6.01	6.05	6.05	NA
Germany	5.77	5.74	5.74	NA	New Zealand	5.74	5.80	5.80	NA
Greece	4.48	4.53	4.53	NA	Russia	3.94	4.25	4.25	NA
Hungary	4.69	4.69	4.69	NA	Serbia	3.72	3.83	3.83	NA
Ireland	5.62	5.56	5.56	NA	South Korea	5.71	5.45	5.45	NA
Italy	4.19	4.15	4.15	NA	Switzerland	6.12	6.05	6.05	NA
Latvia	4.70	4.99	4.99	NA	Turkey	5.34	5.23	5.23	NA
Lithuania	5.21	5.36	5.36	NA	USA	5.99	6.07	6.07	NA
Luxembourg	5.90	5.98	5.98	NA					
Malta	5.48	5.20	5.20	NA					
Netherlands	5.68	5.63	5.63	NA					
Poland	4.15	4.20	4.20	NA					
Portugal	5.54	5.62	5.62	NA					
Romania	4.27	4.44	4.44	NA					
Slovakia	4.69	4.81	4.81	NA					
Slovenia	4.82	4.94	4.94	NA					
Spain	5.04	4.90	4.90	NA					
Sweden	6.23	5.96	5.96	NA					
UK	5.65	5.72	5.72	NA					

**Table 28 Raw data scores for business technology integration indicator 4a3**

Social Media use (Percentage of businesses)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.33</b>	<b>0.39</b>	<b>0.40</b>	<b>0.45</b>	<b>Non-EU avg.</b>	<b>0.37</b>	<b>0.42</b>	<b>0.44</b>	<b>0.50</b>
Austria	0.39	0.41	0.42	0.50	Australia	0.43	0.51	0.54	0.58
Belgium	0.35	NA	0.45	0.53	Brazil	0.39	0.43	0.50	NA
Bulgaria	NA	NA	NA	NA	Canada	0.44	NA	NA	NA
Croatia	NA	NA	NA	NA	Chile	NA	NA	NA	NA
Cyprus	NA	NA	NA	NA	China	NA	NA	NA	NA
Czech Rep.	0.16	0.34	0.25	0.34	Iceland	0.60	0.63	NA	NA
Denmark	0.40	0.49	0.56	0.64	Israel	NA	NA	NA	NA
Estonia	0.27	0.28	0.33	0.39	Japan	0.16	0.18	0.23	NA
Finland	0.37	0.46	0.50	0.60	Mexico	NA	0.30	NA	NA
France	0.19	NA	0.30	0.36	Norway	0.46	0.53	0.60	0.68
Germany	0.33	0.33	0.38	0.47	New Zealand	NA	NA	NA	NA
Greece	0.34	0.38	0.37	0.44	Russia	NA	NA	NA	NA
Hungary	0.26	0.26	0.29	0.34	Serbia	NA	NA	NA	NA
Ireland	0.48	0.60	0.64	0.66	South Korea	NA	NA	NA	NA
Italy	0.25	0.32	0.37	0.39	Switzerland	NA	NA	0.38	NA
Latvia	0.15	0.19	0.28	0.26	Turkey	NA	NA	0.39	0.38
Lithuania	0.38	0.36	0.42	0.45	USA	NA	NA	NA	NA
Luxembourg	0.30	0.36	0.39	0.49					
Malta	NA	NA	NA	NA					
Netherlands	0.50	0.58	0.63	0.65					
Poland	0.19	0.22	0.22	0.25					
Portugal	0.36	0.39	0.38	0.44					
Romania	NA	NA	NA	NA					
Slovakia	0.26	0.29	0.34	0.34					
Slovenia	0.37	0.39	0.42	0.46					
Spain	0.32	0.37	0.40	0.44					
Sweden	0.45	0.48	0.53	0.58					
UK	0.42	0.44	0.54	0.59					

**Table 29 Raw data scores for business technology integration indicator 4b1**

Business-to-Business Internet Use (Score of 1-7)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>5.46</b>	<b>5.40</b>	<b>5.32</b>	<b>5.34</b>	<b>Non-EU avg.</b>	<b>5.40</b>	<b>5.38</b>	<b>5.37</b>	<b>5.19</b>
Austria	5.95	5.71	5.75	NA	Australia	5.58	5.52	5.50	NA
Belgium	5.62	5.58	5.70	NA	Brazil	5.11	4.62	4.58	NA
Bulgaria	4.77	5.06	4.94	NA	Canada	5.52	5.58	5.63	NA
Croatia	5.18	5.07	4.72	NA	Chile	5.47	5.34	5.23	NA
Cyprus	4.81	4.84	4.80	NA	China	4.87	4.90	4.88	NA
Czech Rep.	5.65	5.56	5.47	NA	Iceland	5.68	5.79	5.88	NA
Denmark	5.69	5.55	5.65	NA	Israel	5.32	5.50	5.74	NA
Estonia	6.05	6.14	5.97	NA	Japan	6.00	6.07	6.06	NA
Finland	6.17	6.06	5.94	NA	Mexico	4.90	4.69	4.81	NA
France	5.46	5.17	5.33	NA	Norway	6.00	5.95	5.94	NA
Germany	5.72	5.52	5.69	NA	New Zealand	5.73	5.65	5.63	NA
Greece	4.42	4.29	4.32	NA	Russia	4.59	4.82	4.82	NA
Hungary	5.30	5.50	5.07	NA	Serbia	4.32	4.50	4.46	NA
Ireland	5.49	5.34	5.44	NA	South Korea	5.84	5.61	5.32	NA
Italy	4.32	4.27	4.53	NA	Switzerland	6.15	6.02	6.01	NA
Latvia	5.20	5.28	5.37	NA	Turkey	5.07	5.28	5.03	NA
Lithuania	6.08	6.36	5.83	NA	USA	5.64	5.63	5.71	NA
Luxembourg	5.88	5.85	5.75	NA					
Malta	5.90	5.49	5.21	NA					
Netherlands	5.93	5.95	5.63	NA					
Poland	4.44	4.33	4.49	NA					
Portugal	5.56	5.57	5.47	NA					
Romania	4.69	4.62	4.53	NA					
Slovakia	5.49	5.56	5.47	NA					
Slovenia	5.47	5.32	5.17	NA					
Spain	5.56	5.15	5.00	NA					
Sweden	6.11	5.85	5.82	NA					
UK	6.06	6.08	6.04	NA					

**Table 30 Raw data scores for business technology integration indicator 4b2**

Secure Internet Servers (Per 1 million people)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>767</b>	<b>883</b>	<b>990</b>	<b>1009</b>	<b>Non-EU avg.</b>	<b>874</b>	<b>1003</b>	<b>1079</b>	<b>1059</b>
Austria	1079	1267	1497	1520	Australia	1251	1348	1457	1431
Belgium	738	855	978	1018	Brazil	57	69	78	79
Bulgaria	146	177	182	173	Canada	1035	1210	1309	1254
Croatia	193	219	266	324	Chile	94	129	147	152
Cyprus	620	607	680	761	China	4	7	10	21
Czech Rep.	564	691	867	1346	Iceland	2916	3216	3407	3151
Denmark	2103	2079	1973	1671	Israel	270	254	289	293
Estonia	753	927	1143	1110	Japan	736	911	970	1071
Finland	1547	1792	1782	1791	Mexico	26	34	40	41
France	486	682	812	849	Norway	1727	1942	2033	2075
Germany	1071	1418	1757	1648	New Zealand	1108	1211	1299	1187
Greece	137	148	192	235	Russia	51	84	126	215
Hungary	250	301	366	404	Serbia	35	44	64	63
Ireland	718	774	850	866	South Korea	1987	2164	2301	2201
Italy	202	251	289	333	Switzerland	2211	2821	3102	3063
Latvia	272	360	457	434	Turkey	50	57	67	80
Lithuania	257	207	244	278	USA	1306	1550	1653	1623
Luxembourg	2190	2644	2914	2639					
Malta	1469	1692	1864	1904					
Netherlands	2382	2633	2828	2904					
Poland	313	430	547	763					
Portugal	218	263	316	381					
Romania	69	125	229	159					
Slovakia	263	321	393	361					
Slovenia	548	648	807	769					
Spain	269	316	362	419					
Sweden	1438	1601	1755	1780					
UK	1193	1289	1383	1409					



**Table 31 Normalised scores for Public Services Dimension**

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.60</b>	<b>0.57</b>	<b>0.60</b>	<b>0.63</b>	<b>Non-EU avg.</b>	<b>0.62</b>	<b>0.62</b>	<b>0.65</b>	<b>0.67</b>
Austria	0.59	0.65	0.65	0.72	Australia	0.77	0.84	0.77	0.89
Belgium	0.54	0.54	0.55	0.61	Brazil	0.60	0.49	0.59	0.62
Bulgaria	0.57	0.34	0.48	0.45	Canada	0.59	0.76	0.79	0.82
Croatia	0.57	0.38	0.65	0.56	Chile	0.78	0.67	0.71	0.61
Cyprus	0.46	0.31	0.40	0.49	China	0.53	0.42	0.41	0.59
Czech Rep.	0.42	0.44	0.57	0.43	Iceland	0.65	0.60	0.70	0.54
Denmark	0.86	0.69	0.69	0.71	Israel	0.60	0.69	0.68	0.65
Estonia	0.88	0.75	0.78	0.85	Japan	0.50	0.67	0.60	0.75
Finland	0.78	0.73	0.81	0.83	Mexico	0.61	0.51	0.67	0.67
France	0.62	0.89	0.67	0.82	Norway	0.75	0.71	0.78	0.73
Germany	0.62	0.64	0.63	0.69	New Zealand	0.78	0.77	0.86	0.82
Greece	0.63	0.48	0.47	0.48	Russia	0.45	0.56	0.49	0.57
Hungary	0.59	0.47	0.59	0.46	Serbia	0.58	0.33	0.58	0.61
Ireland	0.58	0.57	0.72	0.66	South Korea	0.57	0.67	0.70	0.83
Italy	0.44	0.63	0.53	0.68	Switzerland	0.63	0.49	0.60	0.48
Latvia	0.59	0.58	0.53	0.56	Turkey	0.46	0.45	0.44	0.43
Lithuania	0.44	0.55	0.55	0.63	USA	0.59	0.83	0.75	0.79
Luxembourg	0.61	0.63	0.51	0.64					
Malta	0.52	0.39	0.63	0.66					
Netherlands	0.78	0.80	0.68	0.76					
Poland	0.35	0.44	0.43	0.57					
Portugal	0.58	0.52	0.53	0.55					
Romania	0.54	0.42	0.50	0.39					
Slovakia	0.43	0.37	0.44	0.38					
Slovenia	0.70	0.41	0.61	0.67					
Spain	0.55	0.76	0.71	0.82					
Sweden	0.77	0.66	0.79	0.73					
UK	0.80	0.89	0.80	0.90					

**Table 32 Raw Data scores for public services indicator 5a1**

E-government Development Index (Score of 0-1)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.75</b>	<b>0.73</b>	<b>0.74</b>	<b>0.76</b>	<b>Non-EU avg.</b>	<b>0.76</b>	<b>0.74</b>	<b>0.78</b>	<b>0.76</b>
Austria	NA	0.79	NA	0.82	Australia	NA	0.91	NA	0.91
Belgium	NA	0.76	NA	0.79	Brazil	NA	0.60	NA	0.64
Bulgaria	NA	0.54	NA	0.64	Canada	NA	0.84	NA	0.83
Croatia	NA	0.63	NA	0.72	Chile	NA	0.71	NA	0.69
Cyprus	NA	0.60	NA	0.60	China	NA	0.55	NA	0.61
Czech Rep.	NA	0.61	NA	0.65	Iceland	NA	0.80	NA	0.77
Denmark	NA	0.82	NA	0.85	Israel	NA	0.82	NA	0.78
Estonia	NA	0.82	NA	0.83	Japan	NA	0.89	NA	0.84
Finland	NA	0.84	NA	0.88	Mexico	NA	0.57	NA	0.62
France	NA	0.89	NA	0.85	Norway	NA	0.84	NA	0.81
Germany	NA	0.79	NA	0.82	New Zealand	NA	0.86	NA	0.87
Greece	NA	0.71	NA	0.69	Russia	NA	0.73	NA	0.72
Hungary	NA	0.66	NA	0.67	Serbia	NA	0.55	NA	0.71
Ireland	NA	0.78	NA	0.77	South Korea	NA	0.80	NA	0.89
Italy	NA	0.76	NA	0.78	Switzerland	NA	0.73	NA	0.75
Latvia	NA	0.72	NA	0.68	Turkey	NA	0.54	NA	0.59
Lithuania	NA	0.73	NA	0.77	USA	NA	0.87	NA	0.84
Luxembourg	NA	0.76	NA	0.77					
Malta	NA	0.65	NA	0.74					
Netherlands	NA	0.89	NA	0.87					
Poland	NA	0.65	NA	0.72					
Portugal	NA	0.69	NA	0.71					
Romania	NA	0.56	NA	0.56					
Slovakia	NA	0.61	NA	0.59					
Slovenia	NA	0.65	NA	0.78					
Spain	NA	0.84	NA	0.81					
Sweden	NA	0.82	NA	0.87					
UK	NA	0.87	NA	0.92					

**Table 33 Raw data scores for public services indicator 5a2**

Online Service Completion (Score of 0-1)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.71</b>	<b>0.65</b>	<b>0.73</b>	<b>0.75</b>	<b>Non-EU avg.</b>	<b>0.73</b>	<b>0.72</b>	<b>0.80</b>	<b>0.81</b>
Austria	NA	0.75	NA	0.91	Australia	NA	0.93	NA	0.98
Belgium	NA	0.68	NA	0.71	Brazil	NA	0.60	NA	0.73
Bulgaria	NA	0.44	NA	0.57	Canada	NA	0.91	NA	0.96
Croatia	NA	0.46	NA	0.75	Chile	NA	0.82	NA	0.78
Cyprus	NA	0.47	NA	0.54	China	NA	0.61	NA	0.77
Czech Rep.	NA	0.43	NA	0.48	Iceland	NA	0.61	NA	0.62
Denmark	NA	0.66	NA	0.78	Israel	NA	0.87	NA	0.86
Estonia	NA	0.77	NA	0.89	Japan	NA	0.71	NA	0.88
Finland	NA	0.77	NA	0.94	Mexico	NA	0.66	NA	0.85
France	NA	0.99	NA	0.94	Norway	NA	0.76	NA	0.80
Germany	NA	0.67	NA	0.84	New Zealand	NA	0.84	NA	0.94
Greece	NA	0.61	NA	0.58	Russia	NA	0.71	NA	0.73
Hungary	NA	0.56	NA	0.63	Serbia	NA	0.41	NA	0.82
Ireland	NA	0.68	NA	0.72	South Korea	NA	0.81	NA	0.94
Italy	NA	0.75	NA	0.87	Switzerland	NA	0.50	NA	0.60
Latvia	NA	0.70	NA	0.61	Turkey	NA	0.56	NA	0.60
Lithuania	NA	0.76	NA	0.83	USA	NA	0.94	NA	0.93
Luxembourg	NA	0.62	NA	0.72					
Malta	NA	0.40	NA	0.80					
Netherlands	NA	0.93	NA	0.93					
Poland	NA	0.54	NA	0.70					
Portugal	NA	0.64	NA	0.75					
Romania	NA	0.44	NA	0.46					
Slovakia	NA	0.49	NA	0.44					
Slovenia	NA	0.43	NA	0.85					
Spain	NA	0.94	NA	0.91					
Sweden	NA	0.70	NA	0.88					
UK	NA	0.90	NA	0.99					

**Table 34 Raw data scores for public services indicator 5a3**

Open Data (Score of 0 to 1)

	2013	2014	2015	2016		2013	2014	2015	2016
<b>EU28 avg.</b>	<b>0.53</b>	<b>0.56</b>	<b>0.53</b>	<b>0.56</b>	<b>Non-EU avg.</b>	<b>0.55</b>	<b>0.57</b>	<b>0.52</b>	<b>0.57</b>
Austria	0.51	0.59	0.50	0.49	Australia	0.66	0.72	0.67	0.79
Belgium	0.27	0.39	0.43	0.52	Brazil	0.48	0.54	0.61	0.68
Bulgaria	0.52	0.41	0.56	0.45	Canada	0.59	0.59	0.55	0.69
Croatia	0.45	0.41	NA	0.39	Chile	NA	0.61	0.47	0.52
Cyprus	0.03	0.21	NA	NA	China	0.42	0.37	0.18	NA
Czech Rep.	0.45	0.66	0.52	0.50	Iceland	0.55	0.64	0.48	NA
Denmark	0.87	0.83	0.70	0.65	Israel	0.48	0.46	0.38	0.41
Estonia	NA	NA	NA	NA	Japan	0.43	0.61	0.46	0.61
Finland	0.72	0.73	0.67	0.69	Mexico	0.47	0.53	0.58	0.65
France	0.59	0.80	0.63	0.70	Norway	0.76	0.71	0.63	0.69
Germany	0.61	0.69	0.49	0.51	New Zealand	0.66	0.72	NA	0.68
Greece	0.40	0.38	0.39	0.46	Russia	0.43	0.43	0.30	0.43
Hungary	0.42	0.48	NA	NA	Serbia	0.44	0.42	NA	0.41
Ireland	0.40	0.48	0.46	0.67	South Korea	0.43	0.53	0.50	NA
Italy	0.52	0.55	0.55	0.47	Switzerland	0.59	0.58	0.47	0.36
Latvia	NA	0.51	0.46	0.64	Turkey	NA	0.53	0.37	0.37
Lithuania	0.32	0.32	NA	NA	USA	0.87	0.70	0.64	0.65
Luxembourg	NA	NA	0.41	NA					
Malta	0.52	0.52	NA	NA					
Netherlands	0.74	0.64	0.64	0.54					
Poland	0.42	0.42	NA	0.49					
Portugal	0.56	0.47	0.34	0.37					
Romania	0.58	0.64	0.58	0.51					
Slovakia	0.39	0.35	0.35	0.47					
Slovenia	0.73	0.54	NA	0.49					
Spain	0.46	0.52	0.55	NA					
Sweden	0.67	0.66	0.48	0.53					
UK	0.94	0.97	0.76	0.79					



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