



# **INTERNATIONAL TRADE IN ICT SERVICES AND ICT-ENABLED SERVICES**

Proposed Indicators from  
the Partnership on Measuring ICT for Development

**UNCTAD Technical Notes on ICT for Development**

**N°3**





## International Trade in ICT Services and ICT-enabled Services

Proposed Indicators from the Partnership on Measuring ICT for Development<sup>1</sup>



---

<sup>1</sup> This technical note is based on a more detailed report prepared by Dr. Timothy J. Sturgeon, from the MIT Industrial Performance Center, with contributions and guidance from Torbjörn Fredriksson (team leader), Scarlett Fondeur and Diana Korka of UNCTAD. The report was commissioned by UNCTAD, as a contribution to the work of the Partnership on Measuring ICT for Development and its Task Group on Measuring Trade in ICT Services and ICT-enabled Services (TGServ). TGServ members are: UNCTAD, UNSD, WTO, OECD, UNESCWA, ITU and World Bank. The report was presented for feedback at the UN Inter-agency Task Force on International Trade Statistics (TF-ITS) at its meeting held on 22-23 October 2014 at the WTO. Valuable inputs and comments were received from Silvia Matei (IMF), Andreas Maurer (WTO) and Joscelyn Magdeleine (WTO). An earlier version of the report was discussed at the UNCTAD Expert Meeting on Assessing the Feasibility of Measuring Trade in ICT Services and ICT-enabled Services, held in Geneva on 25-26 March 2014. During this meeting valuable inputs and comments were received from Barbara D'Andrea (WTO), Francisco Monge (Ministry of Foreign Trade, Costa Rica), Amitava Saha (Ministry of Commerce and Industry, India), Shyan Mukerjee (Everest Group), Ivan Vallejo (ITU) and Rami Zaatari (UNESCWA). Inputs from Peter Bøegh Nielsen (Statistics Denmark), Clair Brown (UC Berkeley), and Pierre Therrien (Industry Canada) were especially helpful in providing a revised list of business functions for classifying ICT services and ICT-enabled services. Ronald Jansen, Ralf Becker and Alexander Loschky (UNSD) made important comments on an advanced version of the draft. Wido Van Lijf of Statistics New Zealand shared useful experiences regarding the collection of trade in services statistics by mode of delivery. Riina Kerner of Eurostat provided a useful and timely explanation of Eurostat's balance of payments statistics publication practices and plans. Hassiba Benamara of UNCTAD gave helpful guidance on transport services. J. Bradford Jensen of Georgetown University urged the project to strive toward a broad vision of how to improve classifications and data collection for services over all. Financial contribution from the Government of Sweden is gratefully acknowledged for this project.

## A. Introduction

1. Services are becoming more tradable, and more traded, but the statistical system for classifying and capturing these international transactions lags behind. Information and communications technologies (ICTs) are the main enabling factor. Falling prices for voice and data communications, along with the computerization of tasks, allow service providers to segment and relocate work to take advantage of large, remote pools of lower cost labor with the language and technical skills needed to deliver high quality services in a timely manner. A growing number of countries and industries are embracing these opportunities, both as importers and exporters. Services trade is evolving from basic call centers, simple software coding, and generation of digital content to more complex business process such as system design and R&D (UNCTAD, 2009, 2012). It is therefore crucial that policymakers gain the ability to characterize and quantify services imports and exports in more detail and with more precision than the current statistical system allows. This trend will certainly continue. ICT systems have clearly moved beyond their earlier role as labor saving and cost-cutting tools to become core platforms on which innovation and work takes place, quality is ensured, and products are built and delivered. Because of this, data improvements need to encompass both the trade generated by provision of ICT services (telecommunications services, IT system design, software development, and related tasks), *and* the remote provision of *ICT-enabled* services, such as human resource management, payroll, accounting, architectural design, research, editing, education, and so on.

2. Policy interest in ICT services and ICT-enabled services trade is very high. It represents an increasingly important component of the information economy, and is of strong and growing concern to policymakers and other stakeholders. It offers considerable development opportunities by linking economies into global value chains and enhancing the productivity and competitiveness of ICT-using industries, while also creating anxiety in some importing countries about job loss. In its effort to ensure that ICTs benefit all, and in keeping with the commitments made at the World Summit of the Information Society (WSIS), the international community needs adequate statistics to monitor and better understand ICT impacts nationally and internationally (WSIS+10 high level event outcome documents, 2014). Fulfilling these commitments will not be easy. Compounding the difficulties inherent in collecting statistics on services (e.g., their ephemeral and non-physical character) are the rapid advances in ICT technologies, platforms and business models (e.g. the Internet, cloud computing, etc.) (UNCTAD, 2013, 2015).

3. This technical note attempts to foster improvements in trade in services statistics, with a sectoral focus on ICT services and on ICT-enabled services. The main goal is to identify minimum requirements for collecting and reporting meaningful trade statistics in these two areas. To this end the note builds on existing measurement frameworks, current definitions, international classifications, and data collection activities. It brings together the knowledge and experience in expert communities from both international trade in services and measuring ICT for development.

4. This effort has been undertaken in the context of the work of the Partnership on Measuring ICT for Development, a global initiative to improve the availability and quality of ICT data and indicators, particularly in developing countries, by harmonizing standards and methodologies, providing technical assistance, and collecting and disseminating ICT statistics. In order to achieve internationally comparable and reliable statistics, the Partnership develops and maintains a core list of ICT indicators. The latest version of this list, published in 2013, includes 57 indicators covering the following areas: i) ICT infrastructure and access, ii) access to and use of ICT by households and individuals, iii) use of ICT by businesses, iv) the ICT sector, v) trade in ICT goods, vi) use of ICT in education and vii) e-government (see annex 1). Currently, despite considerable progress on measuring

the coverage, adoption and use of ICT, there are no indicators for trade in ICT services or ICT-enabled services. It is agreed that these key areas of the information economy require urgent attention.

5. In January 2013, the Partnership formed a Task Group on Measuring Trade in ICT Services and ICT-enabled Services (TGServ) to develop recommendations for statistical indicators for these components of services trade. TGServ is led by UNCTAD and current members include UNCTAD, UNSD, OECD, WTO, ITU, UNESCWA and the World Bank. TGServ commissioned a report to propose a set of definitions, indicators and data collection methods for compiling the relevant data. The report was presented for feedback at the 27-28 March 2014 meeting of the United Nations Inter-agency Task Force on Statistics of International Trade in Services (TFSITS), held at the OECD in Paris and at the 22-23 October 2014 meeting of the United Nations Inter-agency Task Force on International Trade Statistics (TFITS), held at the WTO in Geneva. The IMF Balance of Payments Committee was also briefed on the report at its meeting on 27-29 October 2014. Further feedback was received at the OECD Working Party on International Trade in Goods and Trade in Services, 24-26 March 2015.

6. Again, the focus of this work is on two distinct but related components of international trade in services: ICT services and ICT-enabled services. Section B of the note clarifies the coverage of activities comprised under ICT services which, according to the definition developed by the OECD and adopted by the Partnership, includes activities that are "*intended to enable and/or fulfill the function of information processing and communication.*" It proposes the creation of a complementary grouping for ICT services using balance of payments statistics disaggregated at the three-digit level of EBOPS 2010. This approach is relatively straightforward, although data reporting remains weak. It follows the data collection methodology developed in the Manual on Statistics of International Trade in Services (MSITS 2010) (United Nations, 2012) and the IMF Balance of Payments and International Investment Position Manual (BPM6 in its latest version) (International Monetary Fund, 2009).

7. Despite having a clear definition in international trade statistics, there are currently no agreed-upon Partnership indicators for international trade in ICT services. For trade in ICT goods there are two Partnership core indicators: ICT goods imports as a percentage of total merchandise imports (ICT3) and ICT goods exports as a percentage of total merchandise exports (ICT4). They are compiled using merchandise trade statistics from UNCOMTRADE aggregated from HS 2012 six-digit level product definitions.<sup>2</sup> In this note, a similar set of minimum indicators (imports and exports as a share of total services) are proposed for both ICT services and ICT-enabled services (see recommendations 3 and 8 below).

8. The concept of ICT-enabled services is less straightforward than ICT services and a clear definition has not yet been agreed upon. To remedy this, Section C defines ICT-enabled services as those *services that are delivered remotely over ICT networks*. To provide a systematic taxonomy for ICT-enabled services a classification of services is proposed to distinguish between those services categories that can potentially be delivered remotely over ICT networks and those that cannot. This represents the first systematic and *detailed* attempt to define and classify ICT-enabled services using existing classifications.<sup>3</sup>

---

<sup>2</sup> See (UNCTAD and UNDESA, 2014).

<sup>3</sup> A number of efforts have been made by both governments and other stakeholders to develop definitions and classifications covering ICT-enabled services. For example, several OECD reports that have examined the issue of trade in ICT-enabled services determined that the EBOPS 2010 categories *Computer and information services* (component 9) plus *Other business services* (component 10) together constituted the best available proxy for ICT-enabled services (OECD, 2007, 2006). However, as is discussed in this note, EBOPS component 10 is a poor proxy for ICT-enabled services because it contains services as different as water treatment (not ICT-enabled) and architectural services (possibly ICT-enabled). Efforts to classify ICT-enabled services using *ad-hoc* definitions drawn from industry nomenclature, and not based on existing trade in services classifications include the Reserve Bank of India's Software and IT Exports Services Survey.

9. The Expanded Balance of Payments Services classification (EBOPS 2010) is not detailed enough to allow the identification of a useful minimum set of ICT-enabled services. The approach taken, therefore, is to consider all services starting from the most detailed international classification of services - the Central Product Classification Version 2.1 (CPC Ver.2.1).<sup>4</sup> Again, the proposed classification identifies those services that can potentially be delivered remotely over ICT networks and those that cannot. Because correspondences exist between the CPC classification (product level) and other international classifications, such as EBOPS, and the International Standard Industrial Classification (ISIC) (economic activity level), these are used to bring further clarity as to what types of services are potentially ICT-enabled.

10. Finally, the note outlines a number of recommendations to improve the availability of international trade statistics in ICT services and in ICT-enabled services. The first recommendation, outlined after paragraph 12, is general and reflects the approach taken.

11. It is widely acknowledged that measuring trade in services is more difficult than measuring trade in goods. Services are intangible, hard to define and unlike goods they leave little or no administrative trail when crossing the border. As a result, data on trade in services lack the product and geographical detail available for trade in goods, a problem that creates significant and well-known knowledge gaps (United States Government Accountability Office, 2004, 2005a, 2005b; Sturgeon et al., 2006; National Academy of Public Administration, 2006; Graham et al., 2007; Jensen, 2011). Despite difficulties, progress has been made in developing classifications although reporting still lags behind. Efforts to improve data availability on trade in services have been driven by the rising importance of international trade in services, both in terms of global trade flows and in trade negotiations, especially with the conclusion in 1995 of the General Agreement on Trade in Services (GATS). In response, the UN Statistical Commission adopted the first Manual on Statistics of International Trade in Services (MSITS) as an international standard in 2002, which included the Extended Balance of Payments Services classification (EBOPS 2002), subsequently revised in 2010 as EBOPS 2010. Nevertheless, international trade in services classifications continue to provide significantly less product detail than those for goods.

12. The approach taken here builds on existing international statistical standards and methods for measuring international trade in services, such as the MSITS 2010 and the IMF BPM6 manual. It suggests that the measurement of trade in ICT services should be based on internationally compiled data on trade in services, in line with balance of payments statistics, at the three-digit level of disaggregation of EBOPS 2010.

*Recommendation #1: The proposed definitions of ICT services and ICT-enabled services should build on international classifications of all services products and of all economic activities producing services, and provide an understanding of how to collect related data. It is important to establish and maintain correspondences with other broad frameworks for measuring services such as for international trade, national accounting and employment.*

---

<sup>4</sup> The CPC is used as it is the international reference classification on services, setting the standard for internationally comparable classifications of services, and whose development involved extensive collaboration and consultation with the community of classifications developers. In many cases, the CPC has correspondences to national, multinational and regional statistical classifications. Analysis in this paper was initially based on CPC Ver.2 and then updated to CPC Ver.2.1 released in August 2015.

## B. ICT services

13. As mentioned, the definition of ICT services is well established and relatively mature. ICT service activities are defined in the alternate aggregation of the ISIC Rev.4 as a component of the ICT sector.<sup>5</sup> The definition was developed by the OECD Working Party on Indicators for the Information Society,<sup>6</sup> and subsequently adopted by the Partnership on Measuring ICT for Development. The ICT sector is defined as comprising economic activities whose *"products are intended to enable and/or fulfill the function of information processing and communication,"* including the production of both goods and services.

14. This note uses the correspondences between EBOPS 2010, CPC Ver.2, CPC Ver.2.1, and ISIC Rev.4 to propose a complementary grouping under EBOPS 2010, entitled ICT services, which corresponds well to the existing OECD ICT sector definition mentioned above.<sup>7</sup> The note uses the latest available draft (of 2014) correspondence table between EBOPS 2010 and CPC Ver.2, updated with a transcoding to CPC Ver.2.1.

15. Analyses of trade in ICT services commonly include trade in telecommunications services and in computer and information services, using data from the IMF balance of payments statistics. However, there are some discrepancies between this proxy and the accepted definition of ICT services in terms of outputs of certain ISIC Rev.4 activities. Here we seek to bridge such discrepancies and put in agreement the ICT services definition (in terms of outputs of certain ISIC Rev.4 activities) and the services categories of EBOPS 2010, passing through CPC, which provides the greatest level of detail of the three classifications (see annex 2).<sup>8</sup>

16. Some services items prompted discussion in TGServ and TFSITS (see also annex 2), as follows:

- *Information services* (EBOPS 2010 9.3) are currently included in the BPM6 standard component 9 *Telecommunications, computer, and information services*, but are not part of the economic activities covered by the OECD's ICT sector definition. Information services, such as news agency services and library and information retrieval services, are commonly delivered online. They make use of ICT systems but do not comprise ICT systems. Therefore they do not correspond to the ICT sector definition which stipulates that "the products of the candidate industry must be intended to enable the function of information processing and communication by electronic means". From BPM6 standard component 9 only items 9.1 *telecommunications services* and 9.2 *computer services* correspond to the ICT sector definition. Consequently, it is proposed that information services be excluded from the complementary grouping for ICT services (see Recommendation #2 below). Because EBOPS category 9 includes information services, reporting at the two-digit EBOPS level will be required to exclude it from reported data on trade in ICT Services. One component of information services however does belong to the ICT sector definition. In ISIC Rev.4 this category is entitled 6312 *Web portals* and it corresponds partly to 9.3.2 *Information services- Other information services* and partly to 10.2.2 *Advertising, market research, and public opinion polling*. Web portals are part of the ICT sector definition as

<sup>5</sup> <http://unstats.un.org/unsd/cr/registry/regat.asp>.

<sup>6</sup> See *Information Economy – Sector Definitions based on the International Standard Industry Classification (ISIC Rev.4)*, OECD document DSTI/ICCP/IIS(2006)2/FINAL.

<sup>7</sup> Available data on trade in services are generally compiled at the one-, two- or three-digit level of disaggregation of EBOPS 2010 (maximum 77 types of services), while CPC provides a more detailed product level. There are 275 CPC services codes in the EBOPS 2010-CPC Ver.2 correspondence table.

<sup>8</sup> It should be noted that ISIC is used to classify *establishments or enterprises by their main economic activity*, whereas EBOPS and CPC, used to create the complementary grouping in this note, are used to classify *outputs* of enterprises as specific services products. In principle, one economic activity (ISIC category) can produce several services products (EBOPS/CPC categories).

this class includes the operation of websites that use a search engine to generate and maintain databases of Internet addresses and content in an easily searchable format; and operation of other websites that act as portals to the Internet, such as media sites providing periodically updated content. Excluding EBOPS 2010 9.3 *Information services* from the ICT services complementary grouping also results in excluding unintentionally web search portal activities.

- *Broadcasting services* (CPC Ver.2.1 84631) correspond to *telecommunications services* (cat. 9.1) under EBOPS 2010. CPC Ver.2.1 84631 includes the selection, scheduling and broadcasting of television and radio programmes, and combined programme production and broadcasting services. In ISIC Rev.4, related activities belong to *broadcasting and programming activities* (division 60). Only the transmission activities under this heading meet the criteria for inclusion as ICT services. Programming activities do not, as they are not intended to enable and/or fulfill the function of information processing and communication. However, as the transmission subcomponent is not separately reported,<sup>9</sup> it is recommended to include the entire category 9.1 (telecommunications services) in the ICT services complementary grouping, while at the same time excluding other broadcasting and programming activities covered in EBOPS 2010 by 11.1.1 audiovisual services.

- *Licensing services for the right to use computer software* (CPC Ver.2.1 73311) are also classified differently under EBOPS 2010 and ISIC Rev.4. In EBOPS 2010 they are grouped under standard component 8 - *Charges for the use of intellectual property*, as EBOPS 2010 8.3 - *Licenses to reproduce and/or distribute computer software*. In ISIC Rev.4 related economic activities appear under 5820 - *Software publishing*. As clarified in the explanatory notes to the EBOPS 2010-CPC Ver.2.1 correspondence table, this item:

*"refers only to reproduction and distribution rights, including licenses that provide rights to reproduce and embody software in other products, including other software. End-user licenses, commonly referred to as 'licenses to use' or 'copies' in the System of National Accounts, (which are distinct from 'licenses to reproduce') acquired in electronic format (downloaded) or acquired on physical media with a periodic license fee are included under 9.2.1 Computer services - Computer software. If acquired on physical media with a right to perpetual use, the transactions are included under goods. The use and outright purchase of originals is included in 9.2.1"*.

Since CPC Ver.2.1 73311 is a component of the ICT sector, it is proposed that EBOPS 2010 8.3 - *Licenses to reproduce and/or distribute computer software* be included in the ICT services complementary grouping. Countries should be encouraged to collect and report separately data on EBOPS 2010 8.3, as per the recommendations of the MSITS 2010.

- A perennial question has been whether software products delivered in physical form should be counted as goods or services trade (for example CPC Ver.2.1 47829- *Other application software, packaged*). From a statistical point of view non-customized software is included under trade in goods (see IMF BPM6, table 10.4, UN IMTS para 1.18, UN MSITS, table III.1). However in practice, physical delivery is declining, and most software is acquired and updated online, sometimes in the subscription-like form known as Software-as-a-Service (SaaS), covered in EBOPS under 9.2.1 *Computer services - computer software*.

- New emerging over-the-top (OTT) communications services (such as voice and text over the Internet protocol such as, Skype and WhatsApp, location-based services such as FourSquare, and application service provisioning such as Twitter and Facebook) are taken into account even if not identified by a separate sub-component in ISIC Rev.4 or EBOPS 2010. In EBOPS 2010 they appear under 9.2.2 - *Computer services - Other computer services* and in CPC Ver.2.1 they are

---

<sup>9</sup> It is noted that CPC Ver.2 84631 does not include Internet broadcasting services (streaming). Video and audio streaming are included in the ICT sector complementary grouping under CPC Ver.2 83159 - *Other hosting and IT infrastructure provisioning services/ ISIC rev.4 6311- Data processing, hosting ad related activities/ EBOPS 2010 9.2 computer services*.

included under 8315 - *Hosting and information technology infrastructure provisioning services*, along with cloud computing services. Thus they are included in the ICT services complementary grouping.

- Part of CPC Ver.2.1 92919 *Other education and training services, not elsewhere classified* are included in EBOPS 2010 9.2.2 *Computer services - Other computer services*. Activities covered refer to "specially tailored computer training services provided to an individual or a group" (EBOPS 2010-CPC Ver.2 correspondence table). While this type of activity does not fall under the ICT sector definition, it cannot be reported separately in EBOPS 2010. Thus it will be included in the ICT services complementary grouping.

*Recommendation #2: Create a new complementary grouping of ICT services which includes the following services items at the two-digit level disaggregation of EBOPS 2010 (see table 1):*

- i) Telecommunications services (EBOPS 2010 component 9.1, including broadcasting),*
- ii) Computer software and other computer services (EBOPS 2010 components 9.2.1 and 9.2.2) and*
- iii) Licenses to reproduce and/or distribute computer software (EBOPS 2010 component 8.3).*

**Table 1 ICT services complementary grouping**

EBOPS 2010	EBOPS 2010 description	CPC Ver.2.1	CPC Ver.2.1 description	ISIC Rev.4	ISIC Rev.4 description
9.1	Telecommunications services	841	Telephony and other telecommunications services	61	Telecommunications
		842	Internet telecommunications services		
		84631	Broadcasting services	60*	Programming and broadcasting activities
9.2.1	Computer services - Computer software	83143	Software originals	5820*	Software publishing
		8434	Software downloads		
		84391	On-line games		
		84392	On-line software		
9.2.2	Computer services - Other computer services	8313	IT consulting and support services	6202*	Computer consultancy and computer facilities management activities
		83141	IT design and development services for applications	6201*	Computer programming activities
		83142	IT design and development services for networks and systems	6202*	Computer consultancy and computer facilities management activities
		8315	Hosting and information technology (IT) infrastructure provisioning services	6311*	Data processing, hosting and related activities
		8316	IT infrastructure and network management services	6202*	Computer consultancy and computer facilities management activities
		8713	Maintenance and repair services of computers and peripheral equipment	9511*	Repair of computers and peripheral equipment
		92919*	Other education and training services, n.e.c.	8549*	Other education
8.3	Licenses to reproduce and/or distribute computer software	73311	Licensing services for the right to use computer software	5820*	Software publishing

Note: \* Partial allocation.



17. Annex 3 shows data availability in 2012 for exports and imports of telecommunications (EBOPS 2010 9.1) and computer services (EBOPS 2010 9.2), presented as "aggregate A", in comparison to the BPM5 standard components communications and computer and information services, presented as "aggregate B".<sup>10</sup> The detailed statistics required for "aggregate A" are available for a majority of reporters. They cover approximately 81% of the globally reported exports of communications, computer and information services ("aggregate B"), and 79% of the related imports. Still, detailed statistics are missing for several significant ICT services traders, such as Bahrain, Chile, China, Egypt, Indonesia, Japan, Kuwait, Mexico, New Zealand, Qatar, Saudi Arabia, South Africa, Switzerland and Taiwan Province of China. For Singapore and the United Arab Emirates, only total trade in services data are available. Data are presently not collected separately for EBOPS 2010 8.3 - *Licenses to reproduce and/or distribute computer software* at the international level, and the item was not included in the calculations despite its potential influence on the results for several importers and exporters. No data are currently available on trade in ICT services at the three digit level of EBOPS 2010 9.2.1 *Computer services – computer software* or 9.2.2 *Computer services – other computer services*.

18. In 2013, a new concern emerged with regard to the adoption of the BPM6 revision and the possibility of losing detail on the type of ICT services traded if countries report only a single aggregate figure for BPM 6 standard component 9 - *Telecommunications, computer, and information services*.<sup>11</sup>

19. The definition of ICT services should not be limited to available data. The purpose of this note is to provide a framework to improve data availability and data collection efforts. With regard to ICT services, it is possible to use the three-digit level of EBOPS 2010 as a basis for collecting and compiling statistics on the ICT services within the framework of the complementary grouping proposed here. Data collection faces a number of obstacles, but the classification provided by EBOPS 2010 is adequate. When data are not otherwise available it is proposed that countries compile trade statistics for the ICT services complementary grouping based on their national balance of payments data collection and share this data with WTO and UNCTAD.

20. Using the proposed definition of the complementary grouping for ICT services, it is recommended that two new indicators are added to the Partnership's on Measuring ICT for Development list of core indicators, to capture exports and imports of ICT services (recommendation #3).

*Recommendation #3: The following indicators should be added to the Partnership core list of ICT indicators: imports (exports) of ICT services as a proportion of total imports (exports) of services.*

### **C. ICT-enabled services**

21. As already mentioned, statistics that can shed light on ICT-enabled services trade are limited and, when available, challenged by limitations and inconsistencies of definition (UNCTAD, 2009, 2012). Data from the private sector can fill a need, but commonly produce estimates without fully disclosing the sources and methodologies, and use proprietary classifications that limit their comparability. Against this background, several developing countries have called upon the international community to help develop indicators and methodologies for collecting internationally comparable data. This section addresses the data issue by identifying categories of services that can potentially be delivered internationally over ICT networks; a category known as ICT-enabled services (ITES).

---

<sup>10</sup> BPM5 standard component communication services includes postal and courier services and telecommunications services.

<sup>11</sup> OECD countries that have recently passed to BPM6 did not report detailed data by sub-components.

22. ICT-enabled services lack an internationally agreed upon definition. Conceptually, ICT-enabled services include activities that can be specified, performed, delivered, evaluated and consumed electronically. Previously, jobs related to ITES have been defined as those which make extensive use of ICT and highly codifiable knowledge, and thus require a minimal degree of face-to-face contact (van Welsum and Reif, 2009). Because it covers inputs, outputs and work processes, this concept is too broad to be used for the measurement of international trade, which focuses on products (outputs) that cross borders. To address this issue the note proposes a product-based definition of ITES.

23. It is proposed that ITES be defined as "services products delivered remotely over ICT networks" (i.e. over voice or data networks, including the Internet). Trade in ITES would thus essentially encompass all services transactions *delivered remotely over ICT networks* via Mode 1 (cross-border supply), as defined in the GATS and MSITS (2010).<sup>12</sup> Excluded are those services that involve the movement of physical objects or people, such as transport, or those that require face-to-face contact, such as personal services, even if they make use of ICT for purposes other than remote delivery. In other words, while all ITES are delivered via Mode 1 (remotely), all Mode 1 services are not necessarily ICT-enabled (e.g., services products delivered internationally via regular mail).

*Recommendation #4: The following definition of ICT-enabled services is recommended: "ICT-enabled services are services products delivered remotely over ICT networks."*

24. How does the proposed ITES concept relate to existing international classifications of services such as EBOPS 2010 and CPC Ver.2.1 and the standard statistical frameworks for measuring international trade in services developed in BPM6 and MSITS (2010)? The issue is not entirely new. Call centre services and "business process outsourcing" (BPO) were already identified in MSITS (2010) (United Nations, 2012: 81) as an area warranting further attention:

3.294. Call-centre services is not identified as a separate component in BPM6 or EBOPS 2010, which is why it is suggested as a complementary grouping in MSITS 2010. This aggregation groups all relevant transactions (that is, those provided by call centres) included in the various services item, which correspond to services that are provided by call-centres (for example, computer technical support, debt collection or marketing services). Given their growing importance in a number of economies, *a broader grouping could also be created to cover all Business Process Outsourcing (BPO) services* [emphasis added].

25. The existing "call-centre services" complementary grouping has a number of limitations. First, it does not provide a precise definition of call centres (for example neither in terms of minimum number of operators per facility, nor in terms of type of activity), which renders international comparisons difficult. Second, definitions and concepts would need to be adapted to changes in business models and technology. For example, in its annual business survey on services trade, the Reserve Bank of India uses the term "customer contact centers" to cover call centre activities as well as remote sales and other outreach to non-customers, such as survey research. Third, as suggested in this note, call centre activities as defined by CPC Ver.2.1<sup>13</sup> could involve the delivery of a wide variety of established services (e.g., financial services, insurance services, etc.). Call centres do not constitute a service product, *per se*, but a method of organizing work that can be applied to the provision of a wide variety of services. BPM6 and EBOPS 2010 apply the principle of defining items based on the nature of the service, not the method of delivery. This principle is made clear in MSITS

---

<sup>12</sup> "Cross-border supply (Mode 1), where both the supplier and the consumer remain in their respective territories (which would correspond to the traditional notion of trade and cover, for example, services supplied by telephone or the Internet)" (United Nations, 2012: 16, para 2.25).

<sup>13</sup> CPC Ver.2.1 8593 *Telephone-based support services* includes two sub-categories: *Telephone call centre services* (85931), which includes "taking orders for clients by telephone, soliciting contribution or providing information for clients by telephone, and telemarketing"; and *Other telephone-based support services* (85939), which includes "telephone answering services and telephone wake-up services." This corresponds to 10.3.5. *Other business services* in EBOPS 2010.

(2010, section K, p.40). The existing "call-centre services" complementary grouping makes an exception from the principle mentioned above:

3.61. In cases where a company "outsources" services that is, contracts another (specialist) company to provide services that were previously internal company functions (for example, billing or information "help" services), those services should be classified to the appropriate services item. *Services supplied by "call centres" and similar types of operation should be classified according to the type of service provided* [emphasis added]. For example, call centres selling products are included in *trade-related services*, while call centres providing computer support are included in *computer services*. Given the analytical interest in these activities, EBOPS 2010 also proposes a complementary grouping for *call-centre services* (see para. 3.294).

26. A subset of *potentially* ITES will *actually* be delivered remotely over ICT networks, and an even smaller share will be delivered from call centres. Thus it is recommended to focus measurement efforts on the broader, more inclusive complementary grouping of ICT-enabled services. Of course it is possible for surveys that focus on exports from call centres to be conducted by countries with a high interest in exports from call centres. But even for these surveys, the complementary grouping developed in this note can provide a useful framework for categorizing exports from call centres.

27. Existing statistics on international trade in services do not distinguish services by mode of delivery. Balance of payments statistics include data on services delivered via Mode 1, 2 and 4 indiscriminately (MSITS, 2010).<sup>14</sup> Trade statistics by mode of delivery are compiled by only a limited number of economies with data obtained from business surveys.<sup>15</sup> As mentioned earlier, trade in ITES by definition only occurs according to Mode 1 (cross-border supply).

28. As a guide to a first estimation of the distribution of trade in services by mode of supply, MSITS (2010) proposes a simplified allocation of main balance of payments service categories by dominant mode(s) of supply (table V.2, p.132, MSITS 2010). Accordingly, the following services are predominantly delivered via Mode 1: transport, insurance and pension services, financial services, charges for the use of intellectual property rights, telecommunications, information services, operating leasing services, trade-related services and distribution (wholesale, retail trade) services. MSITS (2010) also notes that some services do not have a single predominant mode of supply. For example, the following are delivered predominantly via both Modes 1 and 4<sup>16</sup>: computer services, business services, as well as personal cultural and recreational services. The simplified allocation specifies that the actual distribution by mode of supply may vary from country to country depending on national circumstances. Furthermore the guide does not exclude the possibility of having international trade in services delivered via modes other than the predominant one. Balance of payments statistics do not easily yield information on the value of trade in ITES (via Mode 1).

29. Analysis of the sub-components of the EBOPS 2010 major components confirm that EBOPS categories cannot be used for easily identifying services that can be delivered remotely over ICT networks (potentially ICT-enabled). Figure 1 shows the distribution of CPC Ver.2.1 codes identified as potentially ICT-enabled, by major EBOPS 2010 service component. What emerges is that services that can be delivered remotely over ICT networks are distributed unevenly among the EBOPS 2010

---

<sup>14</sup> MSITS 2010 describes the modalities through which services may be supplied, of which four are identified in the GATS: *cross-border* (Mode 1); *consumption abroad* (Mode 2); *commercial presence* (Mode 3) and *presence of natural persons* (Mode 4). "Distinctions among these modes are based on whether the service supplier and the consumer are present in the same country or in different countries when the transaction is effected." (United Nations, 2012: 3, para 1.12).

<sup>15</sup> In New Zealand 85.8% of commercial services exports in 2011 were provided via Mode 1, with some variation by sector, and as much as 28% of total technical and professional services delivered via Mode 4 (Statistics New Zealand, 2012).

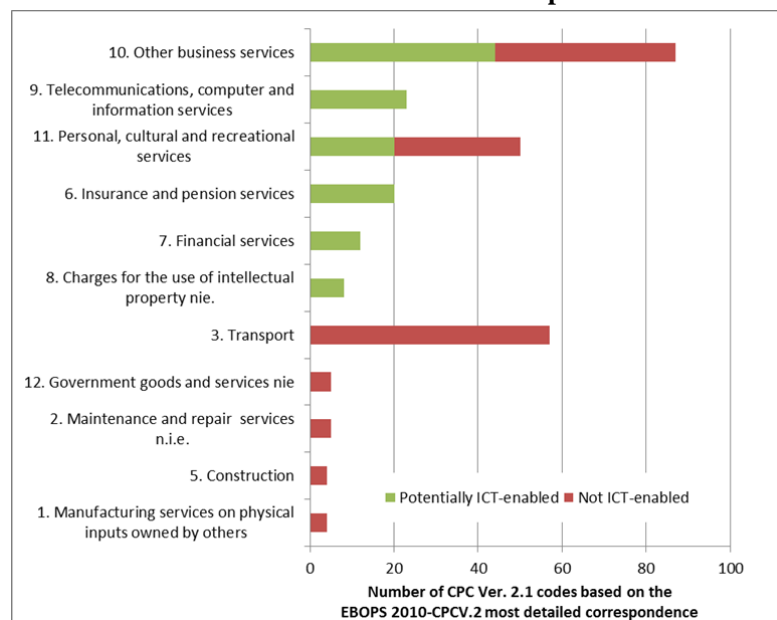
<sup>16</sup> "Presence of natural persons (Mode 4), where an individual (either the service supplier himself if he or she is a self-employed person or his or her employee) is present abroad in order to supply a service (as is the case, for example, when [...] a computer specialist is sent abroad by his employer to supply an information technology (IT) service)" (United Nations, 2012: 16, para 2.25).

major components. The case of EBOPS 10.3.5 *Other Business Services n.i.e.* is salient: only 46% of the CPC Ver. 2.1 product codes included in this category can potentially be delivered remotely. It is therefore not feasible to use EBOPS 2010 and the balance of payments data to extract the value and content of ICT-enabled services from existing statistics.

30. Against this background, this note proposes a complementary grouping that singles out services that can be delivered remotely over ICT networks, i.e. *potentially* ICT-enabled services (see Table 2). Services that cannot be delivered remotely over ICT networks include those that involve the movement of physical objects or people, such as transport services, or those requiring face-to-face contact, such as personal services, even if such services use ICT for other purposes than remote delivery (e.g., to manage logistics for the movement of objects or to keep track of appointments for personal services). The categorization as potentially ICT-enabled or not covers all unique codes identified in the EBOPS 2010 - CPC Ver.2 correspondence table, extended to CPC Ver.2.1 (see summary of codes in Table 3 and detailed correspondences in Annex 4).

31. To develop a useful classification for measuring and reporting international trade in ICT-enabled services, each of the 275 CPC items from the latest EBOPS 2010-CPC Ver.2- CPC Ver.2.1 correspondence table were divided into two main types with altogether 21 logical sub-categories as summarized in table 3: 1) Potentially ICT-enabled services (nine sub-categories); and 2) Non-ICT enabled services, comprising a) Transport and travel services (three sub-categories); and b) On-site or personal services (nine sub-categories). The sub-categories within each of these types were determined with the aim of creating a concise and intuitively logical taxonomy.<sup>17</sup> The nine sub-categories of services that can potentially be delivered remotely over ICT networks (1.1-1.9) comprise the proposed definition of ITES (Table 4). Annex 5 shows the nine sub-categories of potentially ICT-enabled services with the corresponding CPC Ver.2.1 product codes.

**Figure 1. Distribution of potentially ICT-enabled services by EBOPS 2010 major components, EBOPS 2010-CPC Ver.2- CPC Ver.2.1 correspondences**



Source: (United Nations, 2012) and UN Statistical Division, "Correspondence between the EBOPS 2010 and the Central Product Classification (CPC, version 2) - Detailed version" and correspondence between CPC Ver.2 and CPC Ver.2.1 [http://unstats.un.org/unsd/tradeserv/tfsits/msits2010/ebops2cpc\\_detailed.htm#ebops4](http://unstats.un.org/unsd/tradeserv/tfsits/msits2010/ebops2cpc_detailed.htm#ebops4)

<sup>17</sup> This classification still requires the development of a consolidated set of definitions by sub-category (based on the correspondences with EBOPS and CPC).

**Table 2. Classification to identify potentially ICT-enabled services**

Type of service		Description	Possibly ICT-enabled? (can be delivered remotely)
Type 1	Potentially ICT-enabled services	Services that can be delivered remotely. Includes ICT services, sales and marketing, management, administration, and back office services, engineering, R&D, education, as well as any other service than can be delivered remotely.	Yes
Type 2	Not ICT-enabled	Transport and travel services that involve the transport of physical objects, material, and electricity.	No
		On-site or personal services that require on-site or personal delivery.	No

**Table 3. Sub-categories of the classifications of potentially ICT-enabled services and non-ICT enabled services**

Main types and sub-categories	# of EBOPS 2010 codes	# of CPC Ver.2.1 codes	# of ISIC Rev.4 codes
<b>Type 1 Potentially ICT-enabled services</b>	<b>40</b>	<b>109</b>	<b>69</b>
1.1 ICT services – Telecommunications	1	3	2
1.2 ICT services – Computer services (including computer software)	2	12	5
1.3 Sales and marketing services, not including trade and leasing services	2	4	4
1.4 Information services	6	21	11
1.5 Insurance and financial services	8	32	23
1.6 Management, administration, and back office services	4	16	23
1.7 Licensing services	4	7	8
1.8 Engineering, related technical services and R&D	10	24	12
1.9 Education and training services	1	9	2
<b>Type 2 Not ICT-enabled services</b>	<b>40</b>	<b>133</b>	<b>73</b>
<b>Transportation and travel services</b>	<b>22</b>	<b>57</b>	<b>23</b>
2.1 Transportation and travel services - transport industry services	7	17	8
2.2 Transportation and travel services - freight services	9	13	8
2.3 Transportation and travel services - passenger services	6	25	8
<b>In person and on-site services</b>	<b>19</b>	<b>79</b>	<b>55</b>
3.1 In person and on-site services - trade and leasing services	4	16	7
3.2 In person and on-site services - utilities and infrastructure-related services	2	9	4
3.3 In person and on-site services - agricultural, forestry, fishing and mining services	2	3	3
3.4 In person and on-site services - construction services	2	4	2
3.5 In person and on-site services - health and social services	3	6	7
3.6 In person and on-site services - in-person and recreational services	4	26	9
3.7 In person and on-site services - maintenance and repair services	3	18	15
3.8 In person and on-site services - manufacturing services	1	4	3
3.9 In person and on-site services - public and membership organization services	5	7	5

**Table 4. Sub-categories of Type 1: potentially ICT-enabled services**

1.1 ICT services - Telecommunications
1.2 ICT services - Computer services (including computer software)
1.3 Sales and marketing services, not incl. trade and leasing services
1.4 Information services
1.5 Insurance and financial services
1.6 Management, administration, and back office services
1.7 Licensing services
1.8 Engineering, related technical services, research and development (R&D)
1.9 Education and training services

*Recommendation #5: Create a complementary grouping for ICT-enabled services and use the classification developed in this study to measure international trade in ICT-enabled services. The classification contains 9 sub-categories of potentially ICT-enabled services (see table 4).*

32. The proposed new classification reflects comments received by members of the TGServ and TFSITS focusing especially on the following aspects:

i) What to include under "Potentially ICT-enabled services"

- Telemedicine cannot be easily identified as a stand-alone type of service in CPC Ver.2.1. The activity is, however, included in trade in services statistics under EBOPS 2010 item 11.2.1 *Health services*. It was suggested that this item be included under sub-category 1.5 Information services in the new classification.

- Online travel services, especially reservation services, tourism promotion and visitor information services were identified as services that can potentially be delivered remotely. This type appears under CPC Ver.2.1 855 *Travel arrangements, tour operator and related services* and in trade statistics is included under EBOPS 2010 10.3.5 *Other business services n.i.e.* It could therefore be included in sub-category 1.6 Management, administration and back-office services in the new classification. The BPM6 standard component *travel services* is not considered as potentially ICT-enabled as such travel services are generally delivered through consumption abroad, necessitating the physical presence of visitors.

- Call centres activities are included under potentially ICT-enabled services. They correspond to CPC Ver.2.1 85931 *Telephone call centre services* (EBOPS 2010 10.3.5 *Other business services n.i.e.*), partially 83117 *Business process management services* (EBOPS 2010 10.2.1.3 *Business and management consulting and public relation services*), both of which to be included under sub-category 1.6 Management, administration and back-office services under the new classification, as well as partially 83132 *IT support services* (EBOPS 2010 9.2.2 *Computer services - other computer services*) to be included under sub-category 1.2 Computer services in the new classification.

- Financial intermediation services indirectly measured (FISIM)<sup>18</sup> are accounted for separately under EBOPS 2010 in sub-component 7.2. It was suggested to include this type of activity under potentially ICT-enabled services (type 1 in the new classification) together with the other financial services under 1.6 Management, administration and back-office services.

<sup>18</sup> "FISIM is calculated as follows: • For loans from financial corporations, it is the difference between the interest actually payable on loans, and the amount that would be payable if the reference rate were used • For deposits with financial corporations, it is the difference between the interest that would be earned if a reference rate was used, and the interest actually earned." (United Nations, 2012: 65, para 3.206).

ii) Swapping service items between the different sub-categories of the new classification (see the correspondence between the new classification-EBOPS 2010- CPC Ver.2- CPC Ver.2.1- ISIC Rev.4 in annex 4 for reference).

- CPC Ver.2.1 8392 *Design originals* correspond to EBOPS 10.1.1.2 *Sale of proprietary rights arising from research and development* and should be included in the new classification under the sub-category on research and development (R&D) rather than in engineering and related technical services (or under a merged sub-category 1.8 Engineering, related technical services and R&D).

- Audiovisual services and recordings of live performance may be considered information rather than engineering services. Specifically this refers to CPC Ver.2.1 961 *Audio-visual services* [that relate to the production of motion pictures (on film, videotape, or disk or transmitted electronically), radio and television programmes (live or recorded) and musical recordings] - and which correspond to EBOPS 11.1.1 *Audio-visual services*.

iii) Renaming or regrouping sub-categories of the new classifications

- It was suggested to create a separate sub-category for licensing services and other charges for the use of intellectual property and split that on Management, administration and back-office services (1.6). This has been done through sub-category 1.7, which corresponds to EBOPS 2010 component 8 *Charges for the use of intellectual property not included elsewhere*.

- It was suggested to regroup engineering and related technical services together with R&D services as sub-category 1.8 engineering, related technical services and R&D. This suggestion was taken on board and is reflected in Annex 4.

- It was suggested to rename sub-category 1.9 (education and training services) as personal services, since many of its components are derived from EBOPS 2010 component 11, which includes personal services delivered cross-border. This suggestion was not adopted.

33. In terms of collecting data that will make it possible to measure trade in ICT-enabled services, two methods may be considered. It is envisioned that these will be applied flexibly according to the available resources, expertise, and policy interests of member states.

34. A first approach is to measure the value of services delivered via Mode 1 (cross-border supply) following the survey methodology developed in MSITS (2010) for the list of potentially ICT-enabled services<sup>19</sup> (see Annex 4). ICT-enabled services can only be supplied across borders (Mode 1) without travel by natural persons (Mode 4) or consumers (Mode 2). Most services deemed to be supplied cross-border (Mode 1), without people also crossing borders, are ICT-enabled. In this approach, the compiling agency (central bank and/or statistical office) would need to identify modes of supply in collection and compilation. If only administrative records are used (such as ITRS) then these records would need to be examined for clues about the mode of supply employed. If business surveys are used, then questions can be added to identify modes of supply and, by extension, ITES.

*Recommendation #6: To capture the ICT-enabled portion of each category of service, countries may collect data on trade in services according to Modes of Supply 1, 2 and 4. Data according to Mode 1: "Service delivered within the territory of the Member, from the territory of another Member," is equivalent to trade in ICT-enabled services for the selected types of services identified above (Annex 4).*

---

<sup>19</sup> Potentially ICT-enabled services include EBOPS 2010 components 6 *Insurance and pension services*, 7 *Financial services*, 8 *Charges for the use of intellectual property rights n.i.e.*, 9 *Telecommunications, computer, and information services*, and parts of 10 *Other business services* and 11 *Personal, cultural, and recreational services* (see Annex 4 for further detail).

35. If a country is not measuring by modes of supply, but is interested in measuring ICT-enabled services, the following question could be added to existing (or new) business surveys for trade in services:

- Estimate the % of services transactions with [country X] that were delivered remotely (see Table 5)

**Table 5. Model questions for business survey measuring at ICT-enabled services**

Type of Service (based on the alternative grouping for potentially ICT-enabled services)	% of sales to [country X] delivered remotely	% of purchases from [country X] received over Internet or phone,
1.1 ICT services - Telecommunications		
1.2 ICT services - Computer services		
1.3 Sales and marketing services, not including trade and leasing services		
1.4 Information services		
1.5 Insurance and financial services		
1.6 Management, administration, and back office services		
1.7 Licensing services		
1.8 Engineering, related technical services and R&D		
1.9 Education and training services		

*Recommendation #7: If a country is not measuring by modes of supply, but is interested in measuring ICT-enabled services, it could add a specific question on remote delivery of services to the business surveys for trade in services.*

36. The complementary grouping for ICT-enabled services can also be useful for other efforts to improve the collection of international trade in services statistics and other business statistics, including on business functions (Nielsen and Sturgeon, 2014). Collecting trade in services data from business surveys offers the additional possibility of linking services, output and employment data, which are otherwise collected and classified differently. The business survey questions proposed above could be extended to collect data corresponding to the other modes of delivery.

37. To operationalize the ITES definition proposed in this note, it will be necessary to conduct one or several pilot business surveys. In exporting countries the data collection would benefit from the advantage that only a few enterprises sell ITES services abroad. In this case surveys can focus on those enterprises most likely to produce ICT-enabled services (or potentially ICT-enabled services providers) rather than covering the entire economy. The correspondence between the new classification of services and the industry codes (ISIC Rev.4) should help in identifying the relevant industries (see annex 4).

38. It is also recommended that the Partnership on Measuring ICT for Development add another two core indicators to its list to capture exports and imports of trade in ICT-enabled services (recommendation #8).

*Recommendation #8: The following indicators should be added to the Partnership core list of ICT indicators: 1) imports and 2) exports of ICT-enabled services as a proportion of total imports (exports) of services. Reporting data disaggregated by the main sub-categories of the complementary grouping for ICT-enabled services is recommended in addition to the aggregate value.*



## References

- Graham JM, Davis S, Lippodt D, Mann C and Triplett J (2007). The measure of a national: quantifying innovative strength through improved service sector metrics. Special Report No. 11. National Bureau of Asian Research.
- International Monetary Fund (2009). *Balance of Payments and International Investment Position Manual*. International Monetary Fund. Washington, D.C.
- Jensen JB (2011). *Global Trade in Services: Fear, Facts, and Offshoring*. Peterson Institute of International Economics. Washington, DC.
- National Academy of Public Administration (2006). Off-shoring: how big is it? Report by a NAPA panel for the U.S. Congress and the Bureau of Economic Analysis.
- Nielsen PB and Sturgeon T (2014). Using business functions to measure international trade and economic globalization. Prepared for: International Conference on Trade and Economic Globalization 29 September – 1 October 2014, Aguascalientes, Mexico.
- OECD (2006). Potential impacts of international sourcing on different occupations. DSTI/ICCP/IE(2006)1/FINAL. OECD. Paris.
- OECD (2007). Is china the new centre for offshoring of it and ict-enabled services? DSTI/ICCP/IE(2006)10/FINAL. OECD. Paris.
- Sturgeon T, Levy F, Brown C, Jensen JB and Weil D (2006). Why we can't measure the economic effects of services offshoring: the data gaps and how to fill them. MIT Industrial Performance Center working paper 06-006. MIT.
- UNCTAD (2009). *Information Economy Report 2009: Trends and Outlook in Turbulent Times*. United Nations. New York and Geneva.
- UNCTAD (2012). *Information Economy Report 2012: The Software Industry and Developing Countries*. United Nations.
- UNCTAD (2013). *Information Economy Report 2013: The Cloud Economy and Developing Countries*. United Nations. New York and Geneva.
- UNCTAD (2015). *Information Economy Report 2015: Unlocking the Potential of E-Commerce for Developing Countries*. United Nations. New York and Geneva.
- UNCTAD and UNDESA (2014). Updating the partnership definition of ict goods from hs 2007 to hs 2012. Technical Note No. 2.
- United Nations (2012). *Manual on Statistics of International Trade in Services 2010*. United Nations. Geneva; New York.
- United States Government Accountability Office (2004). International trade: current government data provide limited insight into offshoring of services. Report to Congressional Requesters No. GAO-04-932.
- United States Government Accountability Office (2005a). International trade, u.s. and india data on offshoring show significant differences. Report to Congressional Committees No. GAO-06-116.
- United States Government Accountability Office (2005b). Offshoring of services: an overview of the issues. Report to Congressional Committees No. GAO-06-5.
- Van Welsum D and Reif X (2009). We Can Work It Out: The Globalization of ICT-Enabled Services. *NBER*. 289–325.

## Annex 1.

**Table 8. Revised and extended core list of ICT indicators (2013), with current trade-related indicators highlighted**

A1	Fixed telephone subscriptions per 100 inhabitants
A2	Mobile cellular telephone subscriptions per 100 inhabitants
A3	Fixed Internet subscriptions per 100 inhabitants
A4	Fixed broadband Internet subscriptions per 100 inhabitants
A5	Mobile broadband subscriptions per 100 inhabitants
A6	International Internet bandwidth per inhabitant (bits/second/inhabitant)
A7	Percentage of the population covered by a mobile cellular telephone network
A8	Fixed broadband Internet access prices
A9	Mobile cellular telephone prepaid prices
A10	Percentage of localities with public Internet access centres (PIACs)
HH1	Proportion of households with a radio
HH2	Proportion of households with a television
HH3	Proportion of households with telephone
HH4	Proportion of households with a computer
HH5	Proportion of individuals using a computer
HH6	Proportion of households with Internet
HH7	Proportion of individuals using the Internet
HH8	Proportion of individuals using the Internet, by location
HH9	Proportion of individuals using the Internet, by type of activity
HH10	Proportion of individuals using a mobile cellular telephone
HH11	Proportion of households with Internet, by type of service
HH12	Proportion of individuals using the Internet, by frequency
HH13	Proportion of households with multichannel television, by type
HH14	Barriers to household Internet access
HH15	Individuals with ICT skills, by type of skills
HH16	Household expenditure on ICT
B1	Proportion of businesses using computers
B2	Proportion of persons employed routinely using computers
B3	Proportion of businesses using the Internet
B4	Proportion of persons employed routinely using the Internet
B5	Proportion of businesses with a Web presence
B6	Proportion of businesses with an Intranet
B7	Proportion of businesses receiving orders over the Internet
B8	Proportion of businesses placing orders over the Internet
B9	Proportion of businesses using the Internet by type of access
B10	Proportion of businesses with a local area network (LAN)
B11	Proportion of businesses with an Extranet
B12	Proportion of businesses using the Internet by type of activity
ICT1	Proportion of total business sector workforce involved in the ICT sector
ICT2	ICT sector share of gross value added
<b>ICT3</b>	<b>ICT goods imports as a percentage of total imports</b>
<b>ICT4</b>	<b>ICT goods exports as a percentage of total exports</b>
ED1	Proportion of schools with a radio used for educational purposes
ED2	Proportion of schools with a television used for educational purposes
ED3	Proportion of schools with a telephone communication facility
ED4	Learners-to-computer ratio in schools with computer-assisted instruction
ED5	Proportion of schools with Internet access by type of access
ED6	Proportion of learners who have access to the Internet at school
ED7	Proportion of learners enrolled at the post-secondary level in ICT services and ICT-enabled fields
ED8	Proportion of ICT-qualified teachers in schools
EG1	Proportion of persons employed in central Government organizations routinely using computers
EG2	Proportion of persons employed in central Government organizations routinely using the Internet
EG3	Proportion of central Government organizations with a local area network (LAN)
EG4	Proportion of central Government organizations with an Intranet
EG5	Proportion of central Government organizations with Internet access, by type of access
EG6	Proportion of central Government organizations with a Web presence
EG7	Selected Internet-based online services available to citizens, by level of sophistication of service

Source: Partnership (2014), <http://unstats.un.org/unsd/statcom/doc14/2014-8-ICT-E.pdf>.

Annex 2.

**Table 9. ICT service sector definition (based on ISIC Rev.4), with detailed CPC and EBOPS correspondences**

ISIC rev.4	CPC Ver.2.1	EBOPS 2010
5820 - Software publishing	*38582, 47811, 47812, 47813, 47814, 47821, 47822 47829 - Other application software, packaged	NA - In goods category of CPC: 47 - Metal products, machinery and equipment; Radio, television and communication equipment and apparatus; Packaged software: Application software, packaged)
	73311 - Licensing services for the right to use computer software	8.3 - Licenses to reproduce and/or distribute computer software
	83143 - Software originals	9.2.1 - Computer services - Computer software
	84341 - System software downloads	
	84342 - Application software downloads	
	84391 - On-line games	
	84392 - On-line software	
*89110 - Publishing, on a fee or contract basis	Part of 10.3.5 - Other business services n.i.e.	
611 - Wired telecommunications activities 612 - Wireless telecommunications activities 613 - Satellite telecommunications activities 619 - Other telecommunications activities  (Note: each ISIC code above corresponds with multiple CPC codes, 84110 and 8412-84190; CPC does not distinguish between wireless and satellite-based telecommunications)	84110 - Carrier services	9.1 - Telecommunications services
	84120 - Fixed telephony services	
	84131 - Mobile voice services	
	84132 - Mobile text services	
	84133 - Mobile data services, except text services	
	84140 - Private network services	
	84150 - Data transmission services	
	84190 - Other telecommunications services	
	84210 - Internet backbone services	
	84221 - Narrowband Internet access services	
	84222 - Broadband Internet access services	
	84290 - Other Internet telecommunications services	
<i>Not part of the ICT sector definition currently</i>	84631 - Broadcasting services	
6201 - Computer programming activities	83141 - IT design and development services for applications	9.2.2 - Computer services - Other computer services
6202 - Computer consultancy and computer facilities management activities	83131 - IT consulting services	
	83132 - IT support services	
	83142 - IT design and development services for networks and systems	
	83161 - Network management services	
6209 - Other information technology and computer service activities	83162 - Computer systems management services	
6311 - Data processing, hosting and related activities	87332 - Installation services of personal computers and peripheral equipment	Part of 10.3.5 - Other business services n.i.e.
	83151 - Website hosting services	Part of 9.2.2 - Computer services - Other computer services
	83152 - Application service provisioning	
6312 - Web portals	83159 - Other hosting and IT infrastructure provisioning services	10.2.2 - Advertising; market research; and public opinion polling
	*83633 - Sale of Internet advertising space (except on commission)	
9511 - Repair of computers and peripheral equipment	*83633 - Sale of Internet advertising space (except on commission)	Part of 9.3.2 - Information services - Other information services
	84394 - Web search portal content	
9512 - Repair of communication equipment	87130 - Maintenance and repair services of computers and peripheral equipment	Part of 9.2.2 - Computer services - Other computer services
	87153 - Maintenance and repair services of telecommunication equipment and apparatus	2 - Maintenance and repair services n.i.e.
<i>.....Not part of the ICT sector definition in ISIC rev.4</i>		
8549 - Other education	*92919 - Other education and training services, n.e.c	9.2.2 - Computer services - Other computer services
6391 - News agency activities	844 - News agency services	9.3.1 - Information services - News agency services
*5812 - Publishing of directories and mailing lists	8394 - Original compilations of facts/information	9.3.2 - Information services - Other information services
*7490 - Other professional, scientific and technical activities n.e.c.	*8399 - Other professional, technical and business services n.e.c.	
*5813 - Publishing of newspapers, journals and periodicals	84312 - Online newspapers and periodicals	
*5812 - Publishing of directories and mailing lists	84313 - Online directories and mailing lists	
*5819 - Other publishing activities	84393 - Online adult content	
*6312 - Web portals	84394 - Web search portal content	
*5819 - Other publishing activities	84399 - Other online content n.e.c.	
9101 - Library and archives activities	845 - Library and archive services	

\*Partial allocation

Sources: ICT Industry Definition: OECD (2007), Classifying Information and Communication Technology (ICT) Services. DSTI/ICCP/IIS(2006)11/FINAL. [www.oecd.org/dataoecd/39/25/38226951.pdf](http://www.oecd.org/dataoecd/39/25/38226951.pdf). See UNSD website for ISIC-CPC and CPC- EBOPS correspondences.

**Annex 3. Data availability for international trade in ICT services, by BPM5 and BPM6 components, 2012 - Tables 10 and 11**

**Table 10. Exports of ICT services, data availability for BPM5 and BPM6 components, 2012 (US dollars at current prices and current exchange rates in millions)**

Sorted by 1<sup>st</sup> Aggregate A, 2<sup>nd</sup> by BPM5, 3<sup>rd</sup> by Total services, in descending order

ECONOMY	Total services	Communications services (BPM5)	Computer and information services (BPM5)	Telecommunications (EBOPS 2010 9.1)	Computer services (EBOPS 2010 9.2)	Aggregate A (communications & computer and information services)	Aggregate B (telecommunications & computer services)	Proportion of aggregate A in total services	Proportion of aggregate B in total services
India	146'144	1'647	47'178	1'623	46'995	48'826	48'618	33%	33%
Ireland	116'017	806	45'845	645	45'754	46'651	46'399	40%	40%
Germany	270'442	11'974	20'300	3'680	20'300	32'273	23'979	12%	9%
United States	651'492	14'398	17'340	14'009	11'292	31'738	25'301	5%	4%
United Kingdom	291'863	9'491	14'926	7'894	12'130	24'417	20'024	8%	7%
China	191'430	1'793	14'454	..	..	16'247	No data	8%	No data
France	216'227	7'290	6'248	7'239	6'179	13'539	13'418	6%	6%
Netherlands	133'423	5'126	6'497	1'833	4'535	11'623	6'368	9%	5%
Canada	79'787	2'991	7'785	2'023	6'695	10'776	8'718	14%	11%
Belgium	101'534	4'713	5'314	4'059	4'834	10'027	8'893	10%	9%
Sweden	70'988	1'773	8'037	1'480	7'853	9'811	9'333	14%	13%
Spain	137'729	2'114	6'500	-	-	8'614	No data	6%	No data
Italy	105'139	5'686	2'512	5'404	2'410	8'198	7'814	8%	7%
Finland	28'212	404	5'830	259	5'780	6'234	6'039	22%	21%
Israel	30'883	278	4'311	278	4'252	4'589	4'529	15%	15%
Austria	60'485	1'385	3'131	914	2'926	4'516	3'839	7%	6%
Luxembourg	72'202	2'559	1'466	2'531	1'254	4'025	3'785	6%	5%
Russian Federation	59'104	1'550	2'088	1'406	1'995	3'638	3'401	6%	6%
Philippines	20'322	505	2'502	501	2'500	3'007	3'001	15%	15%
Poland	37'906	546	2'413	464	2'232	2'959	2'696	8%	7%
Malaysia	37'615	856	2'069	828	1'990	2'924	2'819	8%	7%
Australia	53'245	1'259	1'545	181	1'468	2'804	1'650	5%	3%
Denmark	66'041	627	2'151	529	1'917	2'778	2'446	4%	4%
China, Hong Kong SAR	125'265	1'760	1'005	1'398	906	2'765	2'304	2%	2%
Czech Rep.	22'062	493	2'014	454	1'991	2'506	2'444	11%	11%
Norway	42'904	953	1'501	802	1'497	2'454	2'299	6%	5%
Japan	145'590	968	1'355	..	..	2'323	No data	2%	No data
Romania	10'812	563	1'450	530	1'447	2'013	1'977	19%	18%
Argentina	15'107	234	1'721	201	1'717	1'955	1'918	13%	13%
Costa Rica	5'483	25	1'831	20	1'831	1'856	1'851	34%	34%
Hungary	20'362	307	1'298	217	1'257	1'604	1'474	8%	7%
Ukraine	19'397	550	992	329	937	1'542	1'266	8%	7%
Indonesia	23'113	1'091	203	..	..	1'294	No data	6%	No data
Portugal	24'539	655	602	623	593	1'257	1'216	5%	5%
Morocco	13'466	681	426	670	420	1'108	1'090	8%	8%
Egypt	21'767	881	203	..	..	1'084	No data	5%	No data
China, Taiwan Province of	49'111	499	505	482	..	1'004	No data	2%	No data
Brazil	39'864	381	596	351	570	977	921	2%	2%
Greece	35'370	455	440	425	418	895	844	3%	2%
Korea, Rep. of	111'559	357	464	165	298	821	463	1%	0%
Bulgaria	7'376	160	597	141	493	756	634	10%	9%
Slovakia	7'156	197	553	167	497	750	664	10%	9%
Sri Lanka	3'800	109	564	109	564	673	673	18%	18%
New Zealand	13'145	181	436	..	..	617	No data	5%	No data
Belarus	5'998	191	416	182	408	607	590	10%	10%
Pakistan	6'600	317	266	316	265	583	581	9%	9%
Serbia	4'789	293	285	291	285	578	576	12%	12%
Slovenia	6'638	367	177	356	139	544	496	8%	7%
Croatia	11'933	271	248	262	237	519	499	4%	4%
Estonia	5'469	210	279	196	264	490	460	9%	8%
South Africa	15'148	185	295	173	..	480	No data	3%	No data
Turkey	43'800	458	17	417	0	475	417	1%	1%
Thailand	49'643	454	20	454	20	474	474	1%	1%
Kenya	4'845	471	0	468	..	471	No data	10%	No data
Bangladesh	2'642	330	84	327	83	413	410	16%	16%
Lebanon	22'139	363	47	356	42	409	398	2%	2%
Tunisia	5'253	340	40	334	40	380	374	7%	7%
Chile	12'456	159	206	..	..	365	No data	3%	No data
Colombia	5'264	294	67	285	59	361	345	7%	7%
Panama	9'348	326	34	321	34	360	355	4%	4%
Guatemala	2'430	288	33	285	31	321	316	13%	13%
Latvia	4'531	124	196	112	177	320	289	7%	6%
Senegal	1'307	242	26	242	-	268	No data	21%	No data
Algeria	3'815	241	23	236	19	264	256	7%	7%
Dominican Rep.	5'765	200	32	153	32	232	185	4%	3%
Honduras	1'066	223	8	222	8	231	230	22%	22%
Uruguay	3'383	37	179	34	179	216	213	6%	6%
Lithuania	5'898	117	92	97	88	208	184	4%	3%
Rep. of Moldova	936	140	56	123	42	196	165	21%	18%

ECONOMY	Total services	Communications services (BPM5)	Computer and information services (BPM5)	Telecommunications (EBOPS 2010 9.1)	Computer services (EBOPS 2010 9.2)	Aggregate A (communications & computer and information services)	Aggregate B (telecommunications & computer services)	Proportion of aggregate A in total services	Proportion of aggregate B in total services
Peru	5'130	147	46	147	..	193	No data	4%	No data
Mauritius	3'408	110	64	106	..	173	No data	5%	No data
Albania	2'141	158	15	141	13	173	154	8%	7%
Ethiopia	2'776	165	0	164	..	165	No data	6%	No data
El Salvador	1'327	95	67	91	67	162	158	12%	12%
Iran (Islamic Rep. of)	6'687	72	86	..	..	158	No data	2%	No data
Venezuela (Bolivarian Rep. of)	2'205	142	12	64	12	154	76	7%	3%
Nicaragua	719	148	1	146	1	149	147	21%	20%
Ecuador	1'810	144	0	144	..	144	No data	8%	No data
Malta	4'885	49	90	36	89	139	125	3%	3%
TFYR of Macedonia	1'052	73	65	71	..	138	No data	13%	No data
Cyprus	7'924	82	54	69	48	136	117	2%	1%
Kazakhstan	4'821	119	17	108	12	136	120	3%	2%
Bolivia (Plurinational State of)	963	80	35	79	10	114	89	12%	9%
Armenia	1'032	33	65	32	61	98	93	9%	9%
Azerbaijan	4'281	91	5	90	3	96	93	2%	2%
Cameroon	1'628	95	1	95	1	96	96	6%	6%
Iceland	3'006	36	57	30	53	93	82	3%	3%
Tajikistan	818	90	0	90	0	90	90	11%	11%
Cambodia	2'545	89	0	45	0	89	45	4%	2%
Bermuda	1'402	48	41	44	41	89	85	6%	6%
Burkina Faso	425	77	5	77	5	81	81	19%	19%
Uganda	2'094	23	57	17	57	80	74	4%	4%
Guyana	298	69	10	69	10	79	79	26%	26%
Madagascar	1'358	39	18	..	..	57	No data	4%	No data
Iraq	2'833	49	7	49	2	56	51	2%	2%
Georgia	2'544	49	4	46	2	53	48	2%	2%
State of Palestine	936	47	5	47	..	52	No data	6%	No data
Nigeria	2'411	51	0	51	..	51	No data	2%	No data
Benin	434	50	0	50	0	50	50	12%	12%
Guinea	159	49	1	49	1	50	50	31%	31%
United Rep. of Tanzania	2'632	39	7	39	7	47	47	2%	2%
Afghanistan	3'056	29	18	28	14	46	42	2%	1%
Dem. Rep. of the Congo	288	45	0	45	..	45	No data	15%	No data
Montenegro	1'264	39	5	38	5	44	43	3%	3%
Mozambique	1'100	32	5	32	4	38	36	3%	3%
Curacao	1'421	25	6	24	6	30	29	2%	2%
Malawi	109	23	1	20	1	24	22	22%	20%
Cabo Verde	598	24	0	..	..	24	No data	4%	No data
Mongolia	961	21	2	21	2	23	23	2%	2%
Aruba	1'758	22	0	..	..	22	No data	1%	No data
Fiji	1'208	21	1	20	1	22	20	2%	2%
Sudan	1'059	19	0	19	0	19	19	2%	2%
Rwanda	425	16	0	16	..	16	No data	4%	No data
Suriname	175	13	1	13	1	14	14	8%	8%
French Polynesia	1'133	14	0	14	0	14	14	1%	1%
Paraguay	756	13	0	12	..	13	No data	2%	No data
Kyrgyzstan	1'230	11	2	11	2	13	13	1%	1%
Namibia	838	12	0	12	0	13	13	2%	2%
Grenada	153	12	0	..	..	12	No data	8%	No data
Faeroe Islands	200	10	0	6	0	11	7	5%	3%
Swaziland	242	9	0	..	..	9	No data	4%	No data
Antigua and Barbuda	496	8	0	..	..	8	No data	2%	No data
Samoa	193	6	1	5	1	7	6	4%	3%
Botswana	260	5	2	5	2	7	7	3%	3%
New Caledonia	549	5	2	5	2	7	7	1%	1%
Sint Maarten (Dutch part)	1'040	6	0	6	0	7	7	1%	1%
Dominica	152	7	0	..	..	7	No data	4%	No data
Saint Vincent and the Grenadines	143	6	0	..	..	6	No data	4%	No data
Saint Kitts and Nevis	182	6	0	..	..	6	No data	3%	No data
Saint Lucia	399	6	0	..	..	6	No data	1%	No data
Montserrat	12	3	0	..	..	3	No data	28%	No data
Vanuatu	322	2	0	1	0	2	2	1%	1%
Papua New Guinea	477	2	0	..	..	2	No data	0%	No data
Anguilla	131	1	0	..	..	1	No data	1%	No data
Tonga	77	1	0	1	0	1	1	1%	1%

ECONOMY	Total services	Communications services (BPM5)	Computer and information services (BPM5)	Telecommunications (EBOPS 2010 9.1)	Computer services (EBOPS 2010 9.2)	Aggregate A (communications & computer and information services)	Aggregate B (telecommunications & computer services)	Proportion of aggregate A in total services	Proportion of aggregate B in total services
Kuwait	8'837	3'448	-	3'446	..	No data	No data	No data	No data
Switzerland	90'831	785	-	..	..	No data	No data	No data	No data
Bahrain	2'819	638	-	638	..	No data	No data	No data	No data
Qatar	9'922	411	-	..	..	No data	No data	No data	No data
Saudi Arabia	11'050	307	-	307	..	No data	No data	No data	No data
Mexico	16'146	255	-	255	..	No data	No data	No data	No data
Nepal	925	231	-	231	..	No data	No data	No data	No data
Mali	340	145	-	140	-	No data	No data	No data	No data
Viet Nam	9'620	138	-	126	..	No data	No data	No data	No data
Jamaica	2'674	117	-	117	-	No data	No data	No data	No data
Bosnia and Herzegovina	1'135	103	-	100	-	No data	No data	No data	No data
Sierra Leone	182	102	-	98	..	No data	No data	No data	No data
Oman	2'874	75	-	75	..	No data	No data	No data	No data
China, Macao SAR	45'331	62	-	62	..	No data	No data	No data	No data
Maldives	2'016	44	-	44	..	No data	No data	No data	No data
Lao People's Dem. Rep.	577	35	-	31	..	No data	No data	No data	No data
Angola	780	33	-	33	..	No data	No data	No data	No data
Zambia	467	28	-	..	..	No data	No data	No data	No data
Haiti	549	26	-	26	..	No data	No data	No data	No data
Belize	406	13	-	13	-	No data	No data	No data	No data
Seychelles	435	10	-	10	..	No data	No data	No data	No data
Libya	152	10	-	10	..	No data	No data	No data	No data
Djibouti	339	10	-	10	..	No data	No data	No data	No data
Timor-Leste	69	7	-	7	..	No data	No data	No data	No data
Lesotho	73	6	-	4	..	No data	No data	No data	No data
Solomon Islands	142	3	-	3	..	No data	No data	No data	No data
Gambia	151	2	-	2	..	No data	No data	No data	No data
Bhutan	102	1	-	1	..	No data	No data	No data	No data
Sao Tome and Principe	18	1	-	1	..	No data	No data	No data	No data
Singapore	117'348	-	-	-	-	No data	No data	No data	No data
United Arab Emirates	15'069	-	-	..	..	No data	No data	No data	No data
Cuba	12'760	-	-	..	..	No data	No data	No data	No data
Jordan	5'686	-	-	..	..	No data	No data	No data	No data
Ghana	3'259	-	-	..	..	No data	No data	No data	No data
Bahamas	2'691	-	-	..	..	No data	No data	No data	No data
Uzbekistan	2'396	-	-	..	..	No data	No data	No data	No data
Yemen	1'159	-	-	-	-	No data	No data	No data	No data
Barbados	1'133	-	-	-	-	No data	No data	No data	No data
Côte d'Ivoire	984	-	-	-	-	No data	No data	No data	No data
Liberia	507	-	-	..	..	No data	No data	No data	No data
Congo	489	-	-	..	..	No data	No data	No data	No data
Chad	415	-	-	..	..	No data	No data	No data	No data
Zimbabwe	387	-	2	..	..	No data	No data	No data	No data
Gabon	180	-	-	..	..	No data	No data	No data	No data
Mauritania	161	-	-	..	..	No data	No data	No data	No data
Burundi	93	-	-	..	..	No data	No data	No data	No data
Central African Rep.	69	-	-	..	..	No data	No data	No data	No data
Comoros	68	-	-	..	..	No data	No data	No data	No data
Equatorial Guinea	59	-	-	..	..	No data	No data	No data	No data
Guinea-Bissau	21	-	-	-	..	No data	No data	No data	No data
WORLD	4'449'558	108'038	253'209	79'532	213'721	354'196	285'293	8%	6%

.. Not available

- Not reported

Source: UNCTAD analysis of WTO-UNCTAD data.

Note: Original data sources are: IMF, Eurostat, OECD, national statistics and UNSD. Communications services (BPM5 standard component 3) include postal and courier services and telecommunications services.

**Table 11. Imports of ICT services, data availability for BPM5 and BPM6 components, 2012 (US dollars at current prices and current exchange rates in millions)**

*Sorted by 1<sup>st</sup> Aggregate A, 2<sup>nd</sup> by BPM5, 3<sup>rd</sup> by Total services, in descending order*

ECONOMY	Total services	Communications services (BPM5)	Computer and information services (BPM5)	Telecommunications (EBOPS 2010 9.1)	Computer services (EBOPS 2010 9.2)	Aggregate A (communications & computer and information services)	Aggregate B (telecommunications & computer services)	Proportion of aggregate A in total services	Proportion of aggregate B in total services
United States	444'674	8'449	25'657	8'007	23'783	34'106	31'790	8%	7%
Germany	295'749	11'526	17'257	5'344	17'257	28'783	22'601	10%	8%
United Kingdom	181'435	7'080	6'823	5'958	5'932	13'903	11'890	8%	7%
France	174'300	4'823	8'292	4'708	8'276	13'116	12'984	8%	7%
Italy	106'090	5'602	4'568	5'330	4'327	10'170	9'657	10%	9%
Netherlands	120'200	4'441	5'361	1'920	4'417	9'802	6'337	8%	5%
Belgium	91'539	3'698	4'108	3'116	3'937	7'806	7'053	9%	8%
Canada	106'765	2'547	3'533	1'562	2'579	6'079	4'141	6%	4%
Sweden	54'410	2'105	3'874	1'707	3'596	5'978	5'302	11%	10%
Japan	176'797	1'184	4'496	..	..	5'680	No data	3%	No data
Spain	90'211	2'687	2'982	2'498	2'355	5'669	4'853	6%	5%
China	281'204	1'647	3'843	..	..	5'490	No data	2%	No data
Russian Federation	106'313	2'538	2'651	2'518	2'313	5'189	4'831	5%	5%
Brazil	80'939	311	4'447	310	4'337	4'758	4'646	6%	6%
India	128'837	1'028	2'518	964	2'107	3'546	3'070	3%	2%
Austria	42'375	1'132	1'886	820	1'652	3'018	2'472	7%	6%
Denmark	58'188	769	2'195	712	2'068	2'965	2'780	5%	5%
China, Hong Kong SAR	58'193	2'375	578	884	478	2'953	1'362	5%	2%
Finland	30'129	518	2'410	400	2'358	2'928	2'758	10%	9%
Malaysia	42'895	1'307	1'462	1'294	1'453	2'768	2'747	6%	6%
Norway	48'539	1'059	1'695	867	1'686	2'754	2'552	6%	5%
Luxembourg	42'193	1'135	1'542	1'113	1'401	2'676	2'514	6%	6%
Poland	31'927	633	1'957	528	1'803	2'591	2'331	8%	7%
Czech Rep.	19'517	821	1'279	552	1'211	2'100	1'763	11%	9%
Australia	64'198	323	1'616	241	1'515	1'939	1'755	3%	3%
Ireland	111'897	1'399	448	1'119	360	1'848	1'479	2%	1%
Korea, Rep. of	105'825	1'104	480	519	155	1'584	674	1%	1%
Indonesia	33'887	717	726	..	..	1'443	No data	4%	No data
Hungary	15'992	406	801	300	732	1'208	1'031	8%	6%
China, Taiwan Province of	42'763	611	568	590	..	1'179	No data	3%	No data
Israel	21'045	278	873	278	758	1'151	1'036	5%	5%
Argentina	18'473	459	638	416	590	1'097	1'005	6%	5%
Portugal	13'376	532	472	511	444	1'005	955	8%	7%
Greece	15'917	650	273	628	242	923	870	6%	5%
Romania	9'345	410	492	406	485	902	891	10%	10%
New Zealand	12'147	207	608	..	..	815	No data	7%	No data
Chile	14'732	197	554	..	..	750	No data	5%	No data
Slovenia	4'321	389	221	378	148	610	526	14%	12%
Nigeria	24'044	412	177	375	168	588	543	2%	2%
Iran (Islamic Rep. of)	12'979	210	331	..	..	541	No data	4%	No data
Ukraine	14'531	151	371	148	334	522	482	4%	3%
Thailand	53'074	462	52	462	52	514	514	1%	1%
Angola	22'119	455	50	455	50	505	505	2%	2%
South Africa	17'671	302	185	266	..	487	No data	3%	No data
Colombia	10'767	279	200	267	157	480	424	4%	4%
Venezuela (Bolivarian Rep. of)	18'164	403	67	332	67	470	399	3%	2%
Egypt	16'450	332	104	..	..	436	No data	3%	No data
Croatia	3'641	171	240	157	208	411	365	11%	10%
Peru	7'388	221	180	221	..	401	No data	5%	No data
Slovakia	6'761	134	257	117	206	391	322	6%	5%
Pakistan	8'417	198	184	191	169	382	360	5%	4%
Serbia	4'155	185	193	182	192	378	374	9%	9%
Estonia	3'909	203	156	190	142	359	332	9%	8%
Philippines	14'009	194	156	194	142	350	336	2%	2%
Turkey	20'891	323	13	282	0	336	282	2%	1%
Lebanon	12'266	197	134	194	131	331	325	3%	3%
Bulgaria	4'386	133	175	116	115	307	231	7%	5%
Kazakhstan	12'735	184	71	169	50	255	220	2%	2%
Latvia	2'611	128	119	119	82	247	201	9%	8%
Kuwait	20'852	238	2	238	2	241	241	1%	1%
Belarus	3'871	150	64	144	56	214	199	6%	5%
Afghanistan	2'239	182	32	182	31	214	213	10%	10%
Sri Lanka	2'538	68	139	68	139	207	207	8%	8%
Cyprus	3'671	173	30	153	27	203	180	6%	5%
Lithuania	4'316	136	54	103	48	189	151	4%	3%
Iraq	13'291	114	52	114	25	166	139	1%	1%
Ethiopia	3'583	163	1	163	..	164	No data	5%	No data
Morocco	8'136	93	63	91	55	156	146	2%	2%
Algeria	10'770	81	55	78	41	136	119	1%	1%
Malta	3'046	88	47	75	45	135	120	4%	4%

ECONOMY	Total services	Communications services (BPM5)	Computer and information services (BPM5)	Telecommunications (EBOPS 2010 9.1)	Computer services (EBOPS 2010 9.2)	Aggregate A (communications & computer and information services)	Aggregate B (telecommunications & computer services)	Proportion of aggregate A in total services	Proportion of aggregate B in total services
Azerbaijan	7'205	72	57	70	25	129	95	2%	1%
Iceland	2'796	48	78	41	63	126	104	5%	4%
Senegal	1'433	87	31	87	-	118	No data	8%	No data
Costa Rica	2'003	82	30	59	30	111	89	6%	4%
Tunisia	3'298	70	31	68	31	101	99	3%	3%
Madagascar	1'370	87	13	..	..	100	No data	7%	No data
Mali	1'049	79	16	88	8	94	96	9%	9%
Burkina Faso	1'208	65	23	65	23	88	88	7%	7%
China, Macao SAR	10'878	40	41	40	41	81	81	1%	1%
Bermuda	981	20	61	20	57	81	77	8%	8%
State of Palestine	1'196	20	60	20	..	80	No data	7%	No data
Mauritius	2'443	61	17	57	..	78	No data	3%	No data
Panama	4'184	70	8	70	8	78	78	2%	2%
Rep. of Moldova	957	40	37	34	32	77	65	8%	7%
Bosnia and Herzegovina	470	68	7	66	7	75	73	16%	15%
TFYR of Macedonia	993	28	46	25	..	74	No data	7%	No data
Honduras	1'512	61	9	46	9	70	55	5%	4%
Viet Nam	12'520	57	-	52	18	No data	70	No data	1%
Guatemala	2'415	52	17	43	16	69	59	3%	2%
Uganda	2'451	27	42	22	42	69	64	3%	3%
Mongolia	2'061	47	22	47	22	69	69	3%	3%
Bolivia (Plurinational State of)	2'000	27	40	24	18	67	42	3%	2%
El Salvador	1'187	45	17	30	16	62	46	5%	4%
Albania	1'872	44	18	43	16	62	60	3%	3%
Dominican Rep.	2'284	38	24	29	24	62	53	3%	2%
Mozambique	4'171	39	19	39	15	58	54	1%	1%
Guyana	526	46	12	46	12	58	58	11%	11%
Papua New Guinea	3'733	34	23	..	..	57	No data	2%	No data
United Rep. of Tanzania	2'360	39	16	39	16	55	55	2%	2%
Aruba	817	33	20	..	..	53	No data	7%	No data
Uruguay	2'324	40	12	36	12	51	48	2%	2%
Fiji	571	31	19	29	19	49	48	9%	8%
Curacao	877	23	26	23	26	49	49	6%	6%
Benin	583	41	7	41	3	48	44	8%	8%
Cambodia	1'546	43	3	37	3	46	40	3%	3%
Montenegro	495	19	26	18	26	45	44	9%	9%
Nicaragua	922	41	0	37	0	41	37	4%	4%
Faeroe Islands	364	14	24	9	23	38	32	10%	9%
Tajikistan	890	35	3	35	3	38	38	4%	4%
Cameroon	2'129	32	3	32	3	35	35	2%	2%
Bangladesh	5'578	25	9	16	8	34	24	1%	0%
Suriname	594	22	11	22	11	33	33	6%	6%
Georgia	1'443	21	12	21	8	33	29	2%	2%
Botswana	661	20	10	20	10	30	30	5%	5%
Armenia	1'175	22	5	21	3	26	24	2%	2%
French Polynesia	517	23	2	23	2	25	25	5%	5%
Sudan	1'987	18	3	18	3	21	21	1%	1%
Kyrgyzstan	1'532	5	15	4	15	20	19	1%	1%
New Caledonia	1'374	8	11	8	11	20	20	1%	1%
Zambia	1'250	15	5	..	..	19	No data	2%	No data
Kenya	2'384	14	1	13	..	15	No data	1%	No data
Sierra Leone	531	13	1	13	0	15	14	3%	3%
Vanuatu	146	12	3	11	3	15	14	10%	10%
Cabo Verde	296	4	10	..	..	14	No data	5%	No data
Sint Maarten (Dutch part)	259	12	1	12	1	13	13	5%	5%
Rwanda	519	12	1	12	..	13	No data	2%	No data
Guinea	882	10	3	10	3	13	13	1%	1%
Lesotho	452	7	2	6	2	9	8	2%	2%
Malawi	230	6	1	5	1	7	6	3%	3%
Paraguay	927	4	2	..	1	6	No data	1%	No data
Belize	188	3	3	3	1	6	4	3%	2%
Bhutan	197	3	2	3	2	5	5	2%	2%
Samoa	100	2	2	1	2	4	3	4%	3%
Montserrat	19	3	0	..	..	3	No data	15%	No data
Timor-Leste	991	2	1	2	..	3	No data	0%	No data
Anguilla	52	3	0	..	..	3	No data	5%	No data
Saint Kitts and Nevis	112	3	0	..	..	3	No data	2%	No data
Grenada	97	2	0	..	..	2	No data	3%	No data
Saint Vincent and the Grenadines	89	1	0	..	..	1	No data	2%	No data
Dominica	64	1	0	..	..	1	No data	2%	No data
Tonga	74	0	0	0	0	1	1	1%	1%
Saudi Arabia	73'407	2'027	-	2'027	..	No data	No data	No data	No data



ECONOMY	Total services	Communications services (BPM5)	Computer and information services (BPM5)	Telecommunications (EBOPS 2010 9.1)	Computer services (EBOPS 2010 9.2)	Aggregate A (communications & computer and information services)	Aggregate B (telecommunications & computer services)	Proportion of aggregate A in total services	Proportion of aggregate B in total services
Qatar	23'906	1'386	-	..	..	No data	No data	No data	No data
Switzerland	46'907	708	-	..	..	No data	No data	No data	No data
Mexico	30'488	185	-	185	..	No data	No data	No data	No data
Jamaica	2'035	67	-	67	-	No data	No data	No data	No data
Oman	8'681	60	-	60	..	No data	No data	No data	No data
Bahrain	1'480	59	-	59	..	No data	No data	No data	No data
Maldives	587	58	-	58	..	No data	No data	No data	No data
Libya	6'996	41	-	41	..	No data	No data	No data	No data
Solomon Islands	203	17	-	..	..	No data	No data	No data	No data
Ecuador	3'217	16	-	16	..	No data	No data	No data	No data
Lao People's Dem. Rep.	341	13	-	8	..	No data	No data	No data	No data
Haiti	1'116	12	-	12	..	No data	No data	No data	No data
Swaziland	827	8	-	..	..	No data	No data	No data	No data
Nepal	896	7	-	7	..	No data	No data	No data	No data
Dem. Rep. of the Congo	2'289	3	-	3	..	No data	No data	No data	No data
Saint Lucia	198	2	-	..	..	No data	No data	No data	No data
Gambia	80	2	-	1	..	No data	No data	No data	No data
Antigua and Barbuda	212	2	-	..	..	No data	No data	No data	No data
Seychelles	207	1	-	1	..	No data	No data	No data	No data
Bahamas	1'538	1	-	1	..	No data	No data	No data	No data
Sao Tome and Principe	25	1	-	1	..	No data	No data	No data	No data
Singapore	123'849	-	-	-	-	No data	No data	No data	No data
United Arab Emirates	63'148	-	-	..	..	No data	No data	No data	No data
Congo	5'137	-	-	..	..	No data	No data	No data	No data
Jordan	4'544	-	-	..	..	No data	No data	No data	No data
Ghana	4'236	-	-	..	..	No data	No data	No data	No data
Equatorial Guinea	3'079	-	-	..	..	No data	No data	No data	No data
Côte d'Ivoire	2'835	-	-	-	-	No data	No data	No data	No data
Gabon	2'515	-	-	..	..	No data	No data	No data	No data
Yemen	2'499	-	-	-	-	No data	No data	No data	No data
Chad	2'473	-	-	..	..	No data	No data	No data	No data
Cuba	2'406	-	-	..	..	No data	No data	No data	No data
Mauritania	1'025	-	-	..	..	No data	No data	No data	No data
Liberia	976	-	-	..	..	No data	No data	No data	No data
Zimbabwe	968	-	10	..	..	No data	No data	No data	No data
Uzbekistan	772	-	-	..	..	No data	No data	No data	No data
Namibia	646	-	25	-	25	No data	No data	No data	No data
Barbados	486	-	-	-	-	No data	No data	No data	No data
Burundi	212	-	-	..	..	No data	No data	No data	No data
Central African Rep.	179	-	-	..	..	No data	No data	No data	No data
Djibouti	160	-	-	..	..	No data	No data	No data	No data
Comoros	105	-	-	..	..	No data	No data	No data	No data
Guinea-Bissau	71	-	-	-	-	No data	No data	No data	No data
<b>WORLD</b>	<b>4'210'365</b>	<b>90'674</b>	<b>129'247</b>	<b>66'697</b>	<b>108'266</b>	<b>215'155</b>	<b>170'934</b>	<b>5%</b>	<b>4%</b>

.. Not available

- Not reported

Source: UNCTAD analysis of WTO-UNCTAD data.

Note: Original data sources are as follows: IMF, Eurostat, OECD, national statistics and UNSD. Communications services (BPM5 standard component 3) include postal and courier services and telecommunications services.

**Annex 4.**

**Table 12. Correspondence between sub-categories of the classification of potentially ICT-enabled services and non-ICT-enabled services, CPC Ver.2.1, EBOPS 2010 and ISIC Rev.4**

Sub-categories of services	Potentially ICT-enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
<b>Type 1: Potentially ICT-enabled services</b>							
1.1 ICT services - Telecommunications	Yes	841	Telephony and other telecommunications services	9.1	Telecommunications services	61	Telecommunications
1.1 ICT services - Telecommunications	Yes	842	Internet telecommunications services	9.1	Telecommunications services	61	Telecommunications
1.1 ICT services - Telecommunications	Yes	84631	Broadcasting services	9.1	Telecommunications services	60*	Programming and broadcasting activities
1.2 ICT services - Computer services (including computer software)	Yes	73311	Licensing services for the right to use computer software	8.3	Licenses to reproduce and/or distribute computer software	5820	Software publishing
1.2 ICT services - Computer services (including computer software)	Yes	8434	Software downloads	9.2.1	Computer services - Computer software	5820	Software publishing
1.2 ICT services - Computer services (including computer software)	Yes	83143	Software originals	9.2.1	Computer services - Computer software	5820	Software publishing
1.2 ICT services - Computer services (including computer software)	Yes	84391	On-line games	9.2.1	Computer services - Computer software	5820	Software publishing
1.2 ICT services - Computer services (including computer software)	Yes	84392	On-line software	9.2.1	Computer services - Computer software	5820	Software publishing
1.2 ICT services - Computer services (including computer software)	Yes	8313	IT consulting and support services	9.2.2	Computer services - Other computer services	6202	Computer consultancy and computer facilities management activities
1.2 ICT services - Computer services (including computer software)	Yes	8315	Hosting and information technology (IT) infrastructure provisioning services	9.2.2	Computer services - Other computer services	6311	Data processing, hosting and related activities
1.2 ICT services - Computer services (including computer software)	Yes	8316	IT infrastructure and network management services	9.2.2	Computer services - Other computer services	6202	Computer consultancy and computer facilities management activities
1.2 ICT services - Computer services (including computer software)	Yes	8713	Maintenance and repair services of computers and peripheral equipment	9.2.2	Computer services - Other computer services	9511	Repair of computers and peripheral equipment
1.2 ICT services - Computer services (including computer software)	Yes	83141	IT design and development services for applications	9.2.2	Computer services - Other computer services	6201	Computer programming activities
1.2 ICT services - Computer services (including computer software)	Yes	83142	IT design and development services for networks and systems	9.2.2	Computer services - Other computer services	6202	Computer consultancy and computer facilities management activities
1.2 ICT services - Computer services (including computer software)	Yes	92919*	Other education and training services, n.e.c.	9.2.2	Computer services - Other computer services	8549*	Other education
1.3 Sales and marketing services, not including trade and leasing services	Yes	836	Advertising services and provision of advertising space or time	10.2.2	Advertising; market research; and public opinion polling	7310	Advertising
1.3 Sales and marketing services, not including trade and leasing services	Yes	837	Market research and public opinion polling services	10.2.2	Advertising; market research; and public opinion polling	7320	Market research and public opinion polling
1.3 Sales and marketing services, not including trade and leasing services	Yes	83812	Advertising and related photography services	10.2.2	Advertising; market research; and public opinion polling	7420	Photographic activities
1.3 Sales and marketing services, not including trade and leasing services	Yes	8596	Convention and trade show assistance and organization services	10.2.2.1	Advertising; market research; and public opinion polling	8230	Organization of conventions and trade shows
1.4 Information services	Yes	961	Audiovisual and related services	11.1.1	Audiovisual services	59	Motion picture, video and television programme production, sound recording and

Sub-categories of services	Potential ly ICT- enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
							music publishing activities
1.4 Information services	Yes	8432	On-line audio content	11.1.1	Audiovisual services	5920	Sound recording and music publishing activities
1.4 Information services	Yes	8433	On-line video content	11.1.1	Audiovisual services	5911	Motion picture, video and television programme production activities
1.4 Information services	Yes	8461	Radio and television broadcast originals	11.1.1	Audiovisual services	60*	Programming and broadcasting activities
1.4 Information services	Yes	84632	Home programme distribution services, basic programming package	11.1.1	Audiovisual services	60*	Programming and broadcasting activities
1.4 Information services	Yes	84633	Home programme distribution services, discretionary programming package	11.1.1	Audiovisual services	60*	Programming and broadcasting activities
1.4 Information services	Yes	84634	Home programme distribution services, pay-per-view	11.1.1	Audiovisual services	60*	Programming and broadcasting activities
1.4 Information services	Yes	8462*	Radio and television channel programmes	11.1.1	Audiovisual services	60*	Programming and broadcasting activities
1.4 Information services	Yes	84311	On-line books	11.1.2	Artistic related services	5811	Book publishing
1.4 Information services <i>Former 3.5 In person and on-site services - health and social services</i>	Yes	931	Human health services	11.2.1	Health services	86	Human health activities
1.4 Information services	Yes	96921	On-line gambling services	11.2.3	Heritage and recreational services	92	Gambling and betting activities
1.4 Information services	Yes	844	News agency services	9.3.1	Information services - News agency services	6391	News agency activities
1.4 Information services	Yes	845	Library and archive services	9.3.2	Information services - Other information services	9101	Library and archives activities
1.4 Information services	Yes	8394	Original compilations of facts/information	9.3.2	Information services - Other information services	5812	Publishing of directories and mailing lists
1.4 Information services	Yes	84312	On-line newspapers and periodicals	9.3.2	Information services - Other information services	5813	Publishing of newspapers, journals and periodicals
1.4 Information services	Yes	84313	On-line directories and mailing lists	9.3.2	Information services - Other information services	5812	Publishing of directories and mailing lists
1.4 Information services	Yes	84393	On-line adult content	9.3.2	Information services - Other information services	5819	Other publishing activities
1.4 Information services	Yes	84394	Web search portal content	9.3.2	Information services - Other information services	6312	Web portals
1.4 Information services	Yes	84399	Other on-line content n.e.c.	9.3.2	Information services - Other information services	5819	Other publishing activities
1.4 Information services	Yes	8399*	All other professional, technical and business services, n.e.c.	9.3.2	Information services - Other information services	7490	Other professional, scientific and technical activities n.e.c.
1.5 Insurance and financial services	Yes	714	Reinsurance services	6.2	Reinsurance	6520	Reinsurance
1.5 Insurance and financial services	Yes	7161	Insurance brokerage and agency services	6.3	Auxiliary insurance services	6622	Activities of insurance agents and brokers

Sub-categories of services	Potential ly ICT- enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
1.5 Insurance and financial services	Yes	7162	Insurance claims adjustment services	6.3	Auxiliary insurance services	6621	Risk and damage evaluation
1.5 Insurance and financial services	Yes	7163	Actuarial services	6.3	Auxiliary insurance services	6629	Other activities auxiliary to insurance and pension funding
1.5 Insurance and financial services	Yes	7169	Other services auxiliary to insurance and pensions	6.3	Auxiliary insurance services	6629	Other activities auxiliary to insurance and pension funding
1.5 Insurance and financial services	Yes	712	Investment banking services	7.1	Financial services	6499	Other financial service activities, except insurance and pension funding activities, n.e.c.
1.5 Insurance and financial services	Yes	715	Services auxiliary to financial services other than to insurance and pensions	7.1	Financial services	66	Activities auxiliary to financial service and insurance activities
1.5 Insurance and financial services	Yes	717	Services of holding financial assets	7.1	Financial services	6420	Activities of holding companies
1.5 Insurance and financial services	Yes	7119	Other financial services, except investment banking, insurance services and pension services	7.1	Financial services	64	Financial service activities, except insurance and pension funding
1.5 Insurance and financial services	Yes	7111*	Central Banking services	7.1	Financial services	64	Financial service activities, except insurance and pension funding
1.5 Insurance and financial services	Yes	7112*	Deposit services	7.1	Financial services	64	Financial service activities, except insurance and pension funding
1.5 Insurance and financial services	Yes	7113*	Credit-granting services	7.1	Financial services	64	Financial service activities, except insurance and pension funding
1.5 Insurance and financial services	Yes	7114*	Financial leasing services	7.1	Financial services	64	Financial service activities, except insurance and pension funding
1.5 Insurance and financial services	Yes	7111*	Central Banking services	7.2	Financial Intermediation Services Indirectly Measured (FISIM)	64	Financial service activities, except insurance and pension funding
1.5 Insurance and financial services	Yes	7112*	Deposit services	7.2	Financial Intermediation Services Indirectly Measured (FISIM)	64	Financial service activities, except insurance and pension funding
1.5 Insurance and financial services	Yes	7113*	Credit-granting services	7.2	Financial Intermediation Services Indirectly Measured (FISIM)	64	Financial service activities, except insurance and pension funding
1.5 Insurance and financial services	Yes	7114*	Financial leasing services	7.2	Financial Intermediation Services Indirectly Measured (FISIM)	64	Financial service activities, except insurance and pension funding
1.5 Insurance and financial services	Yes	71311	Life insurance services	6.1.1	Direct insurance - Life insurance	6511	Life insurance
1.5 Insurance and financial services	Yes	71333	Freight insurance services	6.1.2	Direct insurance - Freight insurance	6512	Non-life insurance
1.5 Insurance and financial services	Yes	7132	Accident and health insurance services	6.1.3	Direct insurance - Other direct insurance	6511	Life insurance
1.5 Insurance and financial services	Yes	71331	Motor vehicle insurance services	6.1.3	Direct insurance - Other direct insurance	6512	Non-life insurance
1.5 Insurance and financial services	Yes	71332	Marine, aviation, and other transport insurance services	6.1.3	Direct insurance - Other direct insurance	6512	Non-life insurance
1.5 Insurance and financial services	Yes	71334	Other property insurance services	6.1.3	Direct insurance - Other direct insurance	6512	Non-life insurance
1.5 Insurance and financial services	Yes	71335	General liability insurance services	6.1.3	Direct insurance - Other direct insurance	6512	Non-life insurance

Sub-categories of services	Potential ly ICT- enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
1.5 Insurance and financial services	Yes	71336*	Credit and surety insurance services	6.1.3	Direct insurance - Other direct insurance	6512	Non-life insurance
1.5 Insurance and financial services	Yes	71337	Travel insurance services	6.1.3	Direct insurance - Other direct insurance	6512	Non-life insurance
1.5 Insurance and financial services	Yes	71339*	Other non-life insurance services	6.1.3	Direct insurance - Other direct insurance	6512	Non-life insurance
1.5 Insurance and financial services	Yes	7164	Pension fund management services	6.4.1	Pension services	6630	Fund management activities
1.5 Insurance and financial services	Yes	71312	Individual pension services	6.4.1	Pension services	6530	Pension funding
1.5 Insurance and financial services	Yes	71313	Group pension services	6.4.1	Pension services	6530	Pension funding
1.5 Insurance and financial services	Yes	71336*	Credit and surety insurance services	6.4.2	Standardized guarantee services	6512	Non-life insurance
1.5 Insurance and financial services	Yes	71339*	Other non-life insurance services	6.4.2	Standardized guarantee services	6512	Non-life insurance
1.6 Management, administration, and back office services	Yes	821	Legal services	10.2.1.1	Legal services	6910	Legal activities
1.6 Management, administration, and back office services	Yes	822	Accounting, auditing and bookkeeping services	10.2.1.2	Accounting; auditing; bookkeeping; and tax consulting services	6920	Accounting, bookkeeping and auditing activities; tax consultancy
1.6 Management, administration, and back office services	Yes	823	Tax consultancy and preparation services	10.2.1.2	Accounting; auditing; bookkeeping; and tax consulting services	6920	Accounting, bookkeeping and auditing activities; tax consultancy
1.6 Management, administration, and back office services	Yes	824	Insolvency and receivership services	10.2.1.2	Accounting; auditing; bookkeeping; and tax consulting services	7020	Management consultancy activities
1.6 Management, administration, and back office services	Yes	8311	Management consulting and management services	10.2.1.3	Business and management consulting and public relations services	7020	Management consultancy activities
1.6 Management, administration, and back office services	Yes	8312	Business consulting services	10.2.1.3	Business and management consulting and public relations services	7020	Management consultancy activities
1.6 Management, administration, and back office services	Yes	8319	Other management services, except construction project management services	10.2.1.3	Business and management consulting and public relations services	7020	Management consultancy activities
1.6 Management, administration, and back office services	Yes	851	Employment services	10.3.5	Other business services n.i.e.	78	Employment activities
1.6 Management, administration, and back office services	Yes	852	Investigation and security services	10.3.5	Other business services n.i.e.	80	Security and investigation activities
1.6 Management, administration, and back office services <i>Former 2.3 Transportation and travel services - passenger services</i>	Yes	855	Travel arrangements, tour operator and related services	10.3.5	Other business services n.i.e.	79	Travel agency, tour operator, reservation service and related activities
1.6 Management, administration, and back office services	Yes	8591	Credit reporting services	10.3.5	Other business services n.i.e.	8291	Activities of collection agencies and credit bureaus
1.6 Management, administration, and back office services	Yes	8592	Collection agency services	10.3.5	Other business services n.i.e.	8291	Activities of collection agencies and credit bureaus
1.6 Management, administration, and back office services	Yes	8593	Telephone-based support services	10.3.5	Other business services n.i.e.	8220	Activities of call centres
1.6 Management, administration, and back office services	Yes	8594	Combined office administrative services	10.3.5	Other business services n.i.e.	8211	Combined office administrative service activities

Sub-categories of services	Potential ly ICT- enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
1.6 Management, administration, and back office services	Yes	8595	Specialized office support services	10.3.5	Other business services n.i.e.	8219	Photocopying, document preparation and other specialized office support activities
1.6 Management, administration, and back office services	Yes	8599	Other information and support services n.e.c.	10.3.5	Other business services n.i.e.	6399, 7490, 8299	Other information service activities, Other professional, scientific and technical activities n.e.c. Other business support service activities n.e.c..
1.7 Licensing services	Yes	73340	Licensing services for the right to use trademarks and franchises	8.1	Franchises and trademarks licensing fees	7740	Leasing of intellectual property and similar products, except copyrighted works
1.7 Licensing services	Yes	7333	Licensing services for the right to use R&D products	8.2	Licenses for the use of outcomes of research and development	7740	Leasing of intellectual property and similar products, except copyrighted works
1.7 Licensing services	Yes	7332*	Licensing services for the right to use entertainment, literary or artistic originals	8.4.1	Licenses to reproduce and/or distribute audiovisual products	5811, 5813, 5911, 5912, 5913, 5920, 9000	Book publishing, Publishing of newspapers, journals and periodicals, Motion picture, video and television programme production, post-production and distribution activities, Sound recording and music publishing activities, Creative, arts and entertainment activities
1.7 Licensing services	Yes	7335	Licensing services for the right to use mineral exploration and evaluation	8.4.2	Licenses to reproduce and/or distribute other products	7740	Leasing of intellectual property and similar products, except copyrighted works
1.7 Licensing services	Yes	7339	Licensing services for the right to use other intellectual property products	8.4.2	Licenses to reproduce and/or distribute other products	7740	Leasing of intellectual property and similar products, except copyrighted works
1.7 Licensing services	Yes	73312	Licensing services for the right to use databases	8.4.2	Licenses to reproduce and/or distribute other products	7740	Leasing of intellectual property and similar products, except copyrighted works
1.7 Licensing services	Yes	7332*	Licensing services for the right to use entertainment, literary or artistic originals	8.4.2	Licenses to reproduce and/or distribute other products	5811, 5813, 5911, 5912, 5913, 5920, 9000	Book publishing, Publishing of newspapers, journals and periodicals, Motion picture, video and television programme production, post-production and distribution activities, Sound recording and music publishing activities, Creative, arts and entertainment activities
1.8 Engineering, related technical services and R&D	Yes	811	Research and experimental development services in natural sciences and engineering	10.1.1.1	Provision of customized and non-customized R&D services	7210	Research and experimental development on natural sciences and engineering
1.8 Engineering, related technical services and R&D	Yes	812	Research and experimental development services in social sciences and humanities	10.1.1.1	Provision of customized and non-customized R&D services	7220	Research and experimental development on social sciences and humanities
1.8 Engineering, related technical services and R&D	Yes	813	Interdisciplinary research and experimental development services	10.1.1.1	Provision of customized and non-customized R&D services	7210	Research and experimental development on natural sciences and engineering
1.8 Engineering, related technical services and R&D	Yes	83912	Industrial design services	10.1.1.1	Provision of customized and non-customized R&D services	7410	Specialized design activities
1.8 Engineering, related technical services and R&D	Yes	814*	Research and development originals	10.1.1.2 .1	Patents	7210	Research and experimental development on natural sciences and engineering
1.8 Engineering, related technical services and R&D	Yes	814*	Research and development originals	10.1.1.2 .2	Copyrights arising from research and development	7210	Research and experimental development on natural sciences and engineering
1.8 Engineering, related technical services and R&D	Yes	814*	Research and development originals	10.1.1.2 .3	Industrial processes and design	7210	Research and experimental development on natural sciences and engineering

Sub-categories of services	Potential ly ICT-enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
1.8 Engineering, related technical services and R&D	Yes	814*	Research and development originals	10.1.1.2.4	Other	7210	Research and experimental development on natural sciences and engineering
1.8 Engineering, related technical services and R&D	Yes	8392	Design originals	10.1.1.2.3	Industrial processes and design	7410	Specialized design activities
1.8 Engineering, related technical services and R&D	Yes	8344*	Technical testing and analysis services	10.1.2	Other research and development services	7120	Technical testing and analysis
1.8 Engineering, related technical services and R&D	Yes	832	Architectural services, urban and land planning and landscape architectural services	10.3.1.1	Architectural services	7110	Architectural and engineering activities and related technical consultancy
1.8 Engineering, related technical services and R&D	Yes	833	Engineering services	10.3.1.2	Engineering services	7110	Architectural and engineering activities and related technical consultancy
1.8 Engineering, related technical services and R&D	Yes	8342	Surface surveying and map-making services	10.3.1.3	Scientific and other technical services	7110	Architectural and engineering activities and related technical consultancy
1.8 Engineering, related technical services and R&D	Yes	8343	Weather forecasting and meteorological services	10.3.1.3	Scientific and other technical services	7490	Other professional, scientific and technical activities n.e.c.
1.8 Engineering, related technical services and R&D	Yes	8393	Scientific and technical consulting services n.e.c.	10.3.1.3	Scientific and other technical services	7490	Other professional, scientific and technical activities n.e.c.
1.8 Engineering, related technical services and R&D	Yes	8344*	Technical testing and analysis services	10.3.1.3	Scientific and other technical services	7120	Technical testing and analysis
1.8 Engineering, related technical services and R&D	Yes	891	Publishing, printing and reproduction services	10.3.5	Other business services n.i.e.	5818	Publishing activities, printing and reproduction of recorded media
1.8 Engineering, related technical services and R&D	Yes	8382	Photographic processing services	10.3.5	Other business services n.i.e.	7420	Photographic activities
1.8 Engineering, related technical services and R&D	Yes	8395	Translation and interpretation services	10.3.5	Other business services n.i.e.	7490	Other professional, scientific and technical activities n.e.c.
1.8 Engineering, related technical services and R&D	Yes	83815	Restoration and retouching services of photography	10.3.5	Other business services n.i.e.	7420	Photographic activities
1.8 Engineering, related technical services and R&D	Yes	83819	Other photography services	10.3.5	Other business services n.i.e.	7420	Photographic activities
1.8 Engineering, related technical services and R&D	Yes	83911	Interior design services	10.3.5	Other business services n.i.e.	7410	Specialized design activities
1.8 Engineering, related technical services and R&D	Yes	83919	Other specialty design services	10.3.5	Other business services n.i.e.	7410	Specialized design activities
1.8 Engineering, related technical services and R&D	Yes	8399*	All other professional, technical and business services, n.e.c.	10.3.5	Other business services n.i.e.	7490	Other professional, scientific and technical activities n.e.c.
1.9 Education and training services	Yes	921	Pre-primary education services	11.2.2	Education services	85	Education
1.9 Education and training services	Yes	922	Primary education services	11.2.2	Education services	85	Education
1.9 Education and training services	Yes	923	Secondary education services	11.2.2	Education services	85	Education
1.9 Education and training services	Yes	924	Post-secondary non-tertiary education services	11.2.2	Education services	85	Education
1.9 Education and training services	Yes	925	Tertiary education services	11.2.2	Education services	85	Education
1.9 Education and training services	Yes	9292	Educational support services	11.2.2	Education services	85	Education

Sub-categories of services	Potential ly ICT- enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
1.9 Education and training services	Yes	92911	Cultural education services	11.2.2	Education services	8549	Other education n.e.c.
1.9 Education and training services	Yes	92912	Sports and recreation education services	11.2.2	Education services	8549	Other education n.e.c.
1.9 Education and training services	Yes	92919*	Other education and training services, n.e.c.	11.2.2	Education services	8549	Other education n.e.c.
<b>Type 2: Not ICT-enabled services</b>							
2.1 Transportation and travel services - transport industry services	No	67511	Port and waterway operation services (excl. cargo handling), on coastal and transoceanic waters	3.1.3	Sea Transport - Other	5222	Service activities incidental to water transportation
2.1 Transportation and travel services - transport industry services	No	67521	Pilotage and berthing services on coastal and transoceanic waters	3.1.3	Sea Transport - Other	5222	Service activities incidental to water transportation
2.1 Transportation and travel services - transport industry services	No	67531	Vessel salvage and refloating services on coastal and transoceanic waters	3.1.3	Sea Transport - Other	5222	Service activities incidental to water transportation
2.1 Transportation and travel services - transport industry services	No	6759	Other supporting services for water transport	3.1.3	Sea Transport - Other	5222	Service activities incidental to water transportation
2.1 Transportation and travel services - transport industry services	No	6761	Airport operation services (excl. cargo handling)	3.2.3	Air transport - Other	5223	Service activities incidental to air transportation
2.1 Transportation and travel services - transport industry services	No	6762	Air traffic control services	3.2.3	Air transport - Other	5223	Service activities incidental to air transportation
2.1 Transportation and travel services - transport industry services	No	6763	Other supporting services for air transport	3.2.3	Air transport - Other	5223	Service activities incidental to air transportation
2.1 Transportation and travel services - transport industry services	No	6764	Supporting services for space transport	3.5	Space transport	5223	Service activities incidental to air transportation
2.1 Transportation and travel services - transport industry services	No	673	Supporting services for railway transport	3.6.3	Rail transport - Other	5221	Service activities incidental to land transportation
2.1 Transportation and travel services - transport industry services	No	674	Supporting services for road transport	3.7.3	Road transport - Other	5221	Service activities incidental to land transportation
2.1 Transportation and travel services - transport industry services	No	67522	Pilotage and berthing services in inland waters	3.8.3	Inland waterway transport - Other	5222	Service activities incidental to water transportation
2.1 Transportation and travel services - transport industry services	No	67532	Vessel salvage and refloating services in inland waters	3.8.3	Inland waterway transport - Other	5222	Service activities incidental to water transportation
2.1 Transportation and travel services - transport industry services	No	63392	Contract food services for transportation operators	3.11	Other supporting and auxiliary services	5629	Other food service activities
2.1 Transportation and travel services - transport industry services	No	671	Cargo handling services	3.11	Other supporting and auxiliary services	5224	Cargo handling
2.1 Transportation and travel services - transport industry services	No	672	Storage and warehousing services	3.11	Other supporting and auxiliary services	5210	Warehousing and storage
2.1 Transportation and travel services - transport industry services	No	679	Other supporting transport services	3.11	Other supporting and auxiliary services	5229	Other transportation support activities
2.1 Transportation and travel services - transport industry services	No	8534*	Specialized cleaning services	3.11	Other supporting and auxiliary services	8129	Other building and industrial cleaning activities
2.2 Transportation and travel services - freight services	No	68	Postal and courier services	3.4	Post and courier services	53	Postal and courier activities



Sub-categories of services	Potentially ICT-enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
2.2 Transportation and travel services - freight services	No	6532	Space transport services of freight	3.5	Space transport	5120	Freight air transport
2.2 Transportation and travel services - freight services	No	6513	Transport services via pipeline	3.9	Pipeline transport	4930	Transport via pipeline
2.2 Transportation and travel services - freight services	No	66022	Rental services of freight vessels for coastal and transoceanic water transport with operator	3.1.2	Sea Transport - Freight	5012	Sea and coastal freight water transport
2.2 Transportation and travel services - freight services	No	6521	Coastal and transoceanic water transport services of freight	3.1.2	Sea Transport - Freight	5012	Sea and coastal freight water transport
2.2 Transportation and travel services - freight services	No	6531	Air transport services of freight	3.2.2	Air transport - Freight	5120	Freight air transport
2.2 Transportation and travel services - freight services	No	66032	Rental services of freight aircraft with operator	3.2.2	Air transport - Freight	5120	Freight air transport
2.2 Transportation and travel services - freight services	No	6512	Railway transport services of freight	3.6.2	Rail transport - Freight	4912	Freight rail transport
2.2 Transportation and travel services - freight services	No	6511	Road transport services of freight	3.7.2	Road transport - Freight	4923	Freight transport by road
2.2 Transportation and travel services - freight services	No	66012	Rental services of trucks with operator	3.7.2	Road transport - Freight	4923	Freight transport by road
2.2 Transportation and travel services - freight services	No	6522	Inland water transport services of freight	3.8.2	Inland waterway transport - Freight	5022	Inland freight water transport
2.2 Transportation and travel services - freight services	No	66024	Rental services of freight vessels for inland water transport with operator	3.8.2	Inland waterway transport - Freight	5022	Inland freight water transport
2.2 Transportation and travel services - freight services	No	67512	Inland waterway operation services (excl. cargo handling)	3.8.3	Inland waterway transport - Other	5222	Service activities incidental to water transportation
2.3 Transportation and travel services - passenger services	No	6425	Space transport services of passengers	3.5	Space transport	5110	Passenger air transport
2.3 Transportation and travel services - passenger services	No	64231	Coastal and transoceanic water transport services of passengers by ferries	3.1.1	Sea Transport - Passenger	5011	Sea and coastal passenger water transport
2.3 Transportation and travel services - passenger services	No	64239	Other coastal and transoceanic water transport services of passengers	3.1.1	Sea Transport - Passenger	5011	Sea and coastal passenger water transport
2.3 Transportation and travel services - passenger services	No	66021	Rental services of passenger vessels for coastal and transoceanic water transport with operator	3.1.1	Sea Transport - Passenger	5011	Sea and coastal passenger water transport
2.3 Transportation and travel services - passenger services	No	6424	Air transport services of passengers	3.2.1	Air transport - Passenger	5110	Passenger air transport
2.3 Transportation and travel services - passenger services	No	64134	Sightseeing services by air	3.2.1	Air transport - Passenger	5110	Passenger air transport
2.3 Transportation and travel services - passenger services	No	66031	Rental services of passenger aircraft with operator	3.2.1	Air transport - Passenger	5110	Passenger air transport
2.3 Transportation and travel services - passenger services	No	6421	Interurban railway transport services of passengers	3.6.1	Rail transport - Passenger	4911	Passenger rail transport, interurban
2.3 Transportation and travel services - passenger services	No	64111	Urban and suburban railway transport services of passengers	3.6.1	Rail transport - Passenger	4921	Urban and suburban passenger land transport
2.3 Transportation and travel services - passenger services	No	64131	Sightseeing services by rail	3.6.1	Rail transport - Passenger	4911	Passenger rail transport, interurban

Sub-categories of services	Potentially ICT-enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
passenger services							
2.3 Transportation and travel services - passenger services	No	6422	Interurban road transport services of passengers	3.7.1	Road transport - Passenger	4922	Other passenger land transport
2.3 Transportation and travel services - passenger services	No	64112	Urban and suburban scheduled road transport services of passengers	3.7.1	Road transport - Passenger	4921	Urban and suburban passenger land transport
2.3 Transportation and travel services - passenger services	No	64113	Mixed mode urban and suburban transportation services of passengers	3.7.1	Road transport - Passenger	4921	Urban and suburban passenger land transport
2.3 Transportation and travel services - passenger services	No	64114	Local special-purpose scheduled road transport services of passengers	3.7.1	Road transport - Passenger	4922	Other passenger land transport
2.3 Transportation and travel services - passenger services	No	64115	Taxi services	3.7.1	Road transport - Passenger	4922	Other passenger land transport
2.3 Transportation and travel services - passenger services	No	64116	Rental services of passenger cars with operator	3.7.1	Road transport - Passenger	4922	Other passenger land transport
2.3 Transportation and travel services - passenger services	No	64117	Road transport services of passengers by man- or animal-drawn vehicles	3.7.1	Road transport - Passenger	4922	Other passenger land transport
2.3 Transportation and travel services - passenger services	No	64118	Non-scheduled local bus and coach charter services	3.7.1	Road transport - Passenger	4922	Other passenger land transport
2.3 Transportation and travel services - passenger services	No	64119	Other land transportation services of passengers, n.e.c.	3.7.1	Road transport - Passenger	4922	Other passenger land transport
2.3 Transportation and travel services - passenger services	No	64132	Sightseeing services by land, except rail	3.7.1	Road transport - Passenger	4922	Other passenger land transport
2.3 Transportation and travel services - passenger services	No	66011	Rental services of buses and coaches with operator	3.7.1	Road transport - Passenger	4922	Other passenger land transport
2.3 Transportation and travel services - passenger services	No	64121	Inland water transport services of passengers by ferries	3.8.1	Inland waterway transport - Passenger	5021	Inland passenger water transport
2.3 Transportation and travel services - passenger services	No	64129	Other inland water transport services of passengers	3.8.1	Inland waterway transport - Passenger	5021	Inland passenger water transport
2.3 Transportation and travel services - passenger services	No	64133	Sightseeing services by water	3.8.1	Inland waterway transport - Passenger	5011	Sea and coastal passenger water transport
2.3 Transportation and travel services - passenger services	No	66023	Rental services of passenger vessels for inland water transport with operator	3.8.1	Inland waterway transport - Passenger	5021	Inland passenger water transport
2.3 Transportation and travel services - passenger services	No	N/A	<i>No CPC correspondence</i>	3.3	Other modes of Transport	N/A	N/A
2.3 Transportation and travel services - passenger services	No	N/A	<i>No CPC correspondence</i>	4	Travel	N/A	N/A
3.1 In person and on-site services - trade and leasing services	No	731	Leasing or rental services concerning machinery and equipment without operator	10.3.3	Operating leasing services	7730	Renting and leasing of other machinery, equipment and tangible goods
3.1 In person and on-site services - trade and leasing services	No	7211	Rental or leasing services involving own or leased property	10.3.3	Operating leasing services	6810	Real estate activities with own or leased property
3.1 In person and on-site services - trade and leasing services	No	7321	Leasing or rental services concerning TVs radios, VCRs and related equip. and accessories	10.3.3	Operating leasing services	7729	Renting and leasing of other personal and household goods

Sub-categories of services	Potential ly ICT- enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
3.1 In person and on-site services - trade and leasing services	No	7323	Leasing or rental services concerning furniture and other household appliances	10.3.3	Operating leasing services	7729	Renting and leasing of other personal and household goods
3.1 In person and on-site services - trade and leasing services	No	7324	Leasing or rental services concerning pleasure and leisure equipment	10.3.3	Operating leasing services	7721	Renting and leasing of recreational and sports goods
3.1 In person and on-site services - trade and leasing services	No	7325	Leasing or rental services concerning household linen	10.3.3	Operating leasing services	7729	Renting and leasing of other personal and household goods
3.1 In person and on-site services - trade and leasing services	No	7326	Leasing or rental services concerning textiles, clothing and footwear	10.3.3	Operating leasing services	7729	Renting and leasing of other personal and household goods
3.1 In person and on-site services - trade and leasing services	No	7327	Leasing or rental services concerning do-it-yourself machinery and equipment	10.3.3	Operating leasing services	7729	Renting and leasing of other personal and household goods
3.1 In person and on-site services - trade and leasing services	No	7329	Leasing or rental services concerning other goods n.e.c.	10.3.3	Operating leasing services	N/A	Renting and leasing of other personal and household goods
3.1 In person and on-site services - trade and leasing services	No	612	Wholesale trade services on a fee or contract basis	10.3.4	Trade-related services	N/A	N/A
3.1 In person and on-site services - trade and leasing services	No	625	Retail trade services on a fee or contract basis	10.3.4	Trade-related services	N/A	N/A
3.1 In person and on-site services - trade and leasing services	No	7222	Building sales on a fee or contract basis	10.3.4	Trade-related services	6820	Real estate activities on a fee or contract basis
3.1 In person and on-site services - trade and leasing services	No	7223	Land sales on a fee or contract basis	10.3.4	Trade-related services	6820	Real estate activities on a fee or contract basis
3.1 In person and on-site services - trade and leasing services	No	7221	Property management services on a fee or contract basis	10.3.5	Other business services n.i.e.	6820	Real estate activities on a fee or contract basis
3.1 In person and on-site services - trade and leasing services	No	7224	Real estate appraisal services on a fee or contract basis	10.3.5	Other business services n.i.e.	6820	Real estate activities on a fee or contract basis
3.1 In person and on-site services - trade and leasing services	No	73220	Leasing or rental services concerning video tapes and disks	11.1.1	Audiovisual services	7722	Renting of video tapes and disks
3.2 In person and on-site services - utilities and infrastructure-related services	No	86311	Support services to electricity transmission	3.10	Electricity transmission	3510	Electric power generation, transmission and distribution
3.2 In person and on-site services - utilities and infrastructure-related services	No	692	Water distribution (on own account)	10.3.5	Other business services n.i.e.	3600	Water collection, treatment and supply
3.2 In person and on-site services - utilities and infrastructure-related services	No	6912	Gas distribution through mains (on own account)	10.3.5	Other business services n.i.e.	3520	Manufacture of gas; distribution of gaseous fuels through mains
3.2 In person and on-site services - utilities and infrastructure-related services	No	8632	Gas distribution services through mains (on a fee or contract basis)	10.3.5	Other business services n.i.e.	3520	Manufacture of gas; distribution of gaseous fuels through mains
3.2 In person and on-site services - utilities and infrastructure-related services	No	8633	Water distribution services through mains (on a fee or contract basis)	10.3.5	Other business services n.i.e.	3600	Water collection, treatment and supply
3.2 In person and on-site services - utilities and infrastructure-related services	No	8634	Distribution services of steam, hot water and AC supply through mains (on a fee or contract basis)	10.3.5	Other business services n.i.e.	3530	Steam and air conditioning supply
3.2 In person and on-site services - utilities and infrastructure-related services	No	8635	Water distribution services, except through mains (on a fee or contract basis)	10.3.5	Other business services n.i.e.	3600	Water collection, treatment and supply
3.2 In person and on-site services - utilities and infrastructure-related services	No	69112	Electricity distribution (on own account)	10.3.5	Other business services n.i.e.	3510	Electric power generation, transmission and distribution

Sub-categories of services	Potential ly ICT-enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
3.2 In person and on-site services - utilities and infrastructure-related services	No	86312	Electricity distribution services (on a fee or contract basis)	10.3.5	Other business services n.i.e.	3510	Electric power generation, transmission and distribution
3.3 In person and on-site services - agricultural, forestry, fishing and mining services	No	861	Support services to agriculture, hunting, forestry and fishing	10.3.2.2	Services incidental to agriculture, forestry and fishing	9609	Other personal service activities n.e.c.
3.3 In person and on-site services - agricultural, forestry, fishing and mining services	No	862	Support services to mining	10.3.2.3	Services incidental to mining, and oil and gas extraction	09	Mining support service activities
3.3 In person and on-site services - agricultural, forestry, fishing and mining services	No	8341	Geological, geophysical and other prospecting services	10.3.2.3	Services incidental to mining, and oil and gas extraction	7110	Architectural and engineering activities and related technical consultancy
3.4 In person and on-site services - construction services	No	53	Constructions	5.1	Construction abroad, credits	41	Construction of buildings
3.4 In person and on-site services - construction services	No	54	Construction services	5.1	Construction abroad, credits	42	Civil engineering
3.4 In person and on-site services - construction services	No	53	Constructions	5.2	Construction in the reporting economy, debits	41	Construction of buildings
3.4 In person and on-site services - construction services	No	54	Construction services	5.2	Construction in the reporting economy, debits	42	Civil engineering
3.5 In person and on-site services - health and social services	No	835	Veterinary services	10.3.2.2	Services incidental to agriculture, forestry and fishing	7500	Veterinary activities
3.5 In person and on-site services - health and social services	No	9321	Residential health-care services other than by hospitals	11.2.1	Health services	8710	Residential nursing care facilities
3.5 In person and on-site services - health and social services	No	933	Other social services with accommodation	11.2.4	Other personal services	8720	Residential care activities for mental retardation, mental health and substance abuse
3.5 In person and on-site services - health and social services	No	934	Social services without accommodation for the elderly and disabled	11.2.4	Other personal services	8810	Social work activities without accommodation for the elderly and disabled
3.5 In person and on-site services - health and social services	No	935	Other social services without accommodation	11.2.4	Other personal services	8890	Other social work activities without accommodation
3.5 In person and on-site services - health and social services	No	9322	Residential care services for the elderly and persons with disabilities	11.2.4	Other personal services	8730	Residential care activities for the elderly and disabled
3.6 In person and on-site services - in-person and recreational services	No	83811	Portrait photography services	10.3.5	Other business services n.i.e.	7420	Photographic activities
3.6 In person and on-site services - in-person and recreational services	No	83813	Event photography and event videography services	10.3.5	Other business services n.i.e.	7420	Photographic activities
3.6 In person and on-site services - in-person and recreational services	No	83814	Specialty photography services	10.3.5	Other business services n.i.e.	7420	Photographic activities
3.6 In person and on-site services - in-person and recreational services	No	962	Performing arts and other live entertainment event presentation and promotion services	11.1.2	Artistic related services	9000	Creative, arts and entertainment activities
3.6 In person and on-site services - in-person and recreational services	No	963	Services of performing and other artists	11.1.2	Artistic related services	9000	Creative, arts and entertainment activities
3.6 In person and on-site services - in-person and recreational services	No	964	Museum and preservation services	11.2.3	Heritage and recreational services	9102	Museums activities and operation of historical sites and buildings

Sub-categories of services	Potential ly ICT-enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
3.6 In person and on-site services - in-person and recreational services	No	965	Sports and recreational sports services	11.2.3	Heritage and recreational services	931	Sports activities
3.6 In person and on-site services - in-person and recreational services	No	966	Services of athletes and related support services	11.2.3	Heritage and recreational services	9319	Other sports activities
3.6 In person and on-site services - in-person and recreational services	No	96910	Amusement park and similar attraction services	11.2.3	Heritage and recreational services	92	Gambling and betting activities
3.6 In person and on-site services - in-person and recreational services	No	96930	Coin-operated amusement machine services	11.2.3	Heritage and recreational services	92	Gambling and betting activities
3.6 In person and on-site services - in-person and recreational services	No	96990	Other recreation and amusement services n.e.c.	11.2.3	Heritage and recreational services	92	Gambling and betting activities
3.6 In person and on-site services - in-person and recreational services	No	96929	Other gambling and betting services	11.2.3	Heritage and recreational services	92	Gambling and betting activities
3.6 In person and on-site services - in-person and recreational services	No	98	Domestic services	11.2.4	Other personal services	9700	Activities of households as employers of domestic personnel
3.6 In person and on-site services - in-person and recreational services	No	631	Accommodation services for visitors	11.2.4	Other personal services	5510, 5520	Short term accommodation activities and Camping grounds, recreational vehicle parks and trailer parks
3.6 In person and on-site services in-person and recreational services	No	632	Other accommodation services for visitors and others	11.2.4	Other personal services	5590	Other accommodation
3.6 In person and on-site services in-person and recreational services	No	634	Beverage serving services	11.2.4	Other personal services	5630	Beverage serving activities
3.6 In person and on-site services in-person and recreational services	No	971	Washing, cleaning and dyeing services	11.2.4	Other personal services	9601	Washing and (dry-) cleaning of textile and fur products
3.6 In person and on-site services - in-person and recreational services	No	972	Beauty and physical well-being services	11.2.4	Other personal services	9602	Hairdressing and other beauty treatment
3.6 In person and on-site services - in-person and recreational services	No	973	Funeral, cremation and undertaking services	11.2.4	Other personal services	9603	Funeral and related activities
3.6 In person and on-site services in-person and recreational services	No	979	Other miscellaneous services	11.2.4	Other personal services	9609	Other personal service activities n.e.c.
3.6 In person and on-site services in-person and recreational services	No	6331	Meal serving services with full restaurant services	11.2.4	Other personal services	5610	Restaurants and mobile food service activities
3.6 In person and on-site services in-person and recreational services	No	6332	Meal serving services with limited services	11.2.4	Other personal services	5610	Restaurants and mobile food service activities
3.6 In person and on-site services in-person and recreational services	No	63391	Event catering services	11.2.4	Other personal services	5621	Event catering
3.6 In person and on-site services in-person and recreational services	No	63393	Other contract food services	11.2.4	Other personal services	5629	Other food service activities
3.6 In person and on-site services in-person and recreational services	No	63399	Other food serving services	11.2.4	Other personal services	5610	Restaurants and mobile food service activities
3.6 In person and on-site services in-person and recreational services	No	63392*	Contract food services for transportation operators	11.2.4	Other personal services	5629	Other food service activities
3.7 In person and on-site services - maintenance and repair services	No	872	Repair services of other goods	2	Maintenance and repair services n.i.e.	9529	Repair of other personal and household goods
3.7 In person and on-site services - maintenance and repair services	No	8711	Maintenance and repair services of fabricated metal products, except machinery and equipment	2	Maintenance and repair services n.i.e.	3311	Repair of fabricated metal products

Sub-categories of services	Potential ly ICT-enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
3.7 In person and on-site services - maintenance and repair services	No	8712	Maintenance and repair services of office and accounting machinery	2	Maintenance and repair services n.i.e.	3312	Repair of machinery
3.7 In person and on-site services - maintenance and repair services	No	8714	Maintenance and repair of transport machinery and equipment	2	Maintenance and repair services n.i.e.	4520	Maintenance and repair of motor vehicles
3.7 In person and on-site services - maintenance and repair services	No	8715	Maintenance and repair services of other machinery and equipment	2	Maintenance and repair services n.i.e.	3312, 3313, 3314, 3319, 4329, 9512, 9521, 9522	Repair of machinery, Repair of electronic and optical equipment, Repair of electrical equipment, Repair of other equipment Other construction installation, Repair of communication equipment, Repair of consumer electronics, Repair of household appliances and home and garden equipment
3.7 In person and on-site services - maintenance and repair services	No	894	Materials recovery (recycling) services, on a fee or contract basis	10.3.2.1	Waste treatment and de-pollution	3830	Materials recovery
3.7 In person and on-site services - maintenance and repair services	No	941	Sewerage, sewage treatment and septic tank cleaning services	10.3.2.1	Waste treatment and de-pollution	3700	Sewerage
3.7 In person and on-site services - maintenance and repair services	No	942	Waste collection services	10.3.2.1	Waste treatment and de-pollution	381	Waste collection
3.7 In person and on-site services - maintenance and repair services	No	943	Waste treatment and disposal services	10.3.2.1	Waste treatment and de-pollution	38	Waste collection, treatment and disposal activities; materials recovery
3.7 In person and on-site services - maintenance and repair services	No	944	Remediation services	10.3.2.1	Waste treatment and de-pollution	3900	Remediation activities and other waste management services
3.7 In person and on-site services - maintenance and repair services	No	945	Sanitation and similar services	10.3.2.1	Waste treatment and de-pollution	8129	Other building and industrial cleaning activities
3.7 In person and on-site services - maintenance and repair services	No	949	Other environmental protection services n.e.c.	10.3.2.1	Waste treatment and de-pollution	3900	Remediation activities and other waste management services
3.7 In person and on-site services - maintenance and repair services	No	873	Installation services (other than construction)	10.3.5	Other business services n.i.e.	3320	Installation of industrial machinery and equipment
3.7 In person and on-site services - maintenance and repair services	No	8531	Disinfecting and exterminating services	10.3.5	Other business services n.i.e.	8129	Other building and industrial cleaning activities
3.7 In person and on-site services - maintenance and repair services	No	8532	Window cleaning services	10.3.5	Other business services n.i.e.	8129	Other building and industrial cleaning activities
3.7 In person and on-site services - maintenance and repair services	No	8533	General cleaning services	10.3.5	Other business services n.i.e.	8121	General cleaning of buildings
3.7 In person and on-site services - maintenance and repair services	No	8597	Landscape care and maintenance services	10.3.5	Other business services n.i.e.	8130	Landscape care and maintenance service activities
3.7 In person and on-site services - maintenance and repair services	No	8534*	Specialized cleaning services	10.3.5	Other business services n.i.e.	8129	Other building and industrial cleaning activities
3.8 In person and on-site services - manufacturing services	No	88	Manufacturing services on physical inputs owned by others	1	Manufacturing services on physical inputs owned by others	N/A	N/A
3.8 In person and on-site services - manufacturing services	No	854	Packaging services	1	Manufacturing services on physical inputs owned by others	3240	Manufacture of games and toys
3.8 In person and on-site services - manufacturing services	No	892	Moulding, pressing, stamping, extruding and similar plastic manufacturing services	1	Manufacturing services on physical inputs owned by others	2220	Manufacture of plastics products
3.8 In person and on-site services -	No	893	Casting, forging, stamping and	1	Manufacturing services on physical	24	Support services to forestry

Sub-categories of services	Potential ly ICT- enabled	CPC Ver.2.1	CPC Ver. 2.1 description	EBOPS 2010	EBOPS 2010 description	ISIC Rev. 4	ISIC Rev.4 description
manufacturing services			similar metal manufacturing services		inputs owned by others		
3.9 In person and on-site services - public and membership organization services	No	69111	Electricity transmission (on own account)	3.10	Electricity transmission	3510	Electric power generation, transmission and distribution
3.9 In person and on-site services - public and membership organization services	No	99	Services provided by extraterritorial organizations and bodies	12.1	Embassies and consulates	9900	Activities of extraterritorial organizations and bodies
3.9 In person and on-site services - public and membership organization services	No	99	Services provided by extraterritorial organizations and bodies	12.2	Military units and agencies	9900	Activities of extraterritorial organizations and bodies
3.9 In person and on-site services - public and membership organization services	No	911	Administrative services of the government	12.3	Other government services	841	Administration of the State and the economic and social policy of the community
3.9 In person and on-site services - public and membership organization services	No	912	Public administrative services provided to the community as a whole	12.3	Other government services	842	Provision of services to the community as a whole
3.9 In person and on-site services - public and membership organization services	No	913	Administrative services related to compulsory social security schemes	12.3	Other government services	8430	Compulsory social security activities
3.9 In person and on-site services - public and membership organization services	No	95	Services of membership organizations	11.2.4	Other personal services	94	Activities of membership organizations

\* Partial allocation

N/A: Not available.

## Annex 5.

**Table 13. Potentially ICT-enabled services sub-groupings with the corresponding CPC Ver.2.1 products codes**

1.1 ICT services - Telecommunications	
841	Telephony and other telecommunications services
842	Internet telecommunications services
84631	Broadcasting services
1.2 ICT services - Computer services (including computer software)	
8313	IT consulting and support services
8315	Hosting and IT infrastructure provisioning services
8316	IT infrastructure and network management services
8434	Software downloads
8713	Maintenance and repair services of computers and peripheral equipment
73311	Licensing services for the right to use computer software
83141	IT design and development services for applications
83142	IT design and development services for networks and systems
83143	Software originals
84391	On-line games
84392	On-line software
92919*	Other education and training services, n.e.c.
1.3 Sales and marketing services, not including trade and leasing services	
836	Advertising services and provision of advertising space or time
837	Market research and public opinion polling services
8596	Convention and trade show assistance and organization services
83812	Advertising and related photography services
1.4 Information services	
844	News agency services
845	Library and archive services
931	Human health services
961	Audiovisual and related services
8394	Original compilations of facts/information
8432	On-line audio content
8433	On-line video content
8461	Radio and television broadcast originals
84311	On-line books
84312	On-line newspapers and periodicals
84313	On-line directories and mailing lists
84393	On-line adult content
84394	Web search portal content
84399	Other on-line content n.e.c.
84632	Home programme distribution services, basic programming package
84633	Home programme distribution services, discretionary programming package
84634	Home programme distribution services, pay-per-view
96921	On-line gambling services
8399*	All other professional, technical and business services, n.e.c.
8462*	Radio and television channel programmes
1.5 Insurance and financial services	
712	Investment banking services
714	Reinsurance services
715	Services auxiliary to financial services other than to insurance and pensions
717	Services of holding financial assets
7119	Other financial services, except investment banking, insurance services and pension services
7132	Accident and health insurance services
7161	Insurance brokerage and agency services
7162	Insurance claims adjustment services
7163	Actuarial services
7164	Pension fund management services
7169	Other services auxiliary to insurance and pensions



71311	Life insurance services
71312	Individual pension services
71313	Group pension services
71331	Motor vehicle insurance services
71332	Marine, aviation, and other transport insurance services
71333	Freight insurance services
71334	Other property insurance services
71335	General liability insurance services
71337	Travel insurance services
7111*	Central Banking services
7112*	Deposit services
7113*	Credit-granting services
7114*	Financial leasing services
71336*	Credit and surety insurance services
71339*	Other non-life insurance services

#### 1.6 Management, administration, and back office services

821	Legal services
822	Accounting, auditing and bookkeeping services
823	Tax consultancy and preparation services
824	Insolvency and receivership services
851	Employment services
852	Investigation and security services
855	Travel arrangements, tour operator and related services
8311	Management consulting and management services
8312	Business consulting services
8319	Other management services, except construction project management services
8591	Credit reporting services
8592	Collection agency services
8593	Telephone-based support services
8594	Combined office administrative services
8595	Specialized office support services
8599	Other information and support services n.e.c.

#### 1.7 Licensing services

7333	Licensing services for the right to use R&D products
7335	Licensing services for the right to use mineral exploration and evaluation
7339	Licensing services for the right to use other intellectual property products
73312	73312 - Licensing services for the right to use databases
73340	Licensing services for the right to use trademarks and franchises
7332*	Licensing services for the right to use entertainment, literary or artistic originals

#### 1.8 Engineering, related technical services and R&D

811	Research and experimental development services in natural sciences and engineering
812	Research and experimental development services in social sciences and humanities
813	Interdisciplinary research and experimental development services
832	Architectural services, urban and land planning and landscape architectural services
833	Engineering services
891	Publishing, printing and reproduction services
8342	Surface surveying and map-making services
8343	Weather forecasting and meteorological services
8382	Photographic processing services
8392	Design originals
8393	Scientific and technical consulting services n.e.c.
8395	Translation and interpretation services
83815	Restoration and retouching services of photography
83819	Other photography services
83911	Interior design services
83912	Industrial design services
83919	Other specialty design services
814*	Research and development originals
8344*	Technical testing and analysis services
8399*	All other professional, technical and business services, n.e.c.

## 1.9 Education and training services

921	Pre-primary education services
922	Primary education services
923	Secondary education services
924	Post-secondary non-tertiary education services
925	Tertiary education services
9292	Educational support services
92911	Cultural education services
92912	Sports and recreation education services
92919*	Other education and training services, n.e.c.

---



## Recent UNCTAD Technical Notes on ICT for Development

01. Implications of Applying the New Definition of «ICT Goods», May 2011

02. Updating the Partnership Definition of ICT Goods From HS 2007 to HS 2012, January 2014

03. International Trade in ICT Services and ICT-enabled Services: Proposed Indicators from the Partnership on Measuring ICT for Development, October 2015

04. Global Assessment of Sex-disaggregated ICT Employment Statistics: Data Availability and Challenges on Measurement and Compilation, July 2015

For more information about UNCTAD's work on ICT for Development please contact:

ICT Analysis Section

Division on Tehcnology and Logistics

[www.unctad.org/ict4d](http://www.unctad.org/ict4d)

[ict4d@unctad.org](mailto:ict4d@unctad.org)

Follow us on Twitter: [@ICT4DatUNCTAD](https://twitter.com/ICT4DatUNCTAD)