

Towards a G20 initiative on measuring Digital Trade: mapping challenges and framing the way forward

1. The German G20 presidency 2017 is focusing on the issue of gaps in digital trade within the G20 Trade and Investment Working Group (TIWG) and has asked the OECD to present an issues note on the status quo, the gaps and the way forward in the measurement of digital trade. This note responds to that request. It has benefitted from inputs from UNCTAD, the World Bank Group and the WTO.

Introduction

2. The Internet and digitalisation are fundamentally changing the way people, businesses and governments interact. This has led to a new era of globalisation underpinned by the movement of data, giving rise to what has become known as the digital economy. Digital trade is one component of this broader digital economy.

3. This note refers to the international trade element of this broader digital landscape. Better understanding and measurement of digital trade will help develop better policy responses to new trade challenges and ensure that the benefits from new digital trade opportunities are more inclusive both within and between countries.

4. This note provides a brief summary of the preliminary work that the OECD is undertaking to develop a framework for the analysis and measurement of digital trade. The work first seeks to develop a typology of digital trade, to promote greater common understanding of what it is we are trying to measure and then develops a framework for measuring digital trade. The note also proposes a possible timeline in the context of the German G20 presidency.

Understanding digital trade

5. In many respects digital trade is not in and of itself new. Digitally related transactions, be they in relation to goods or services have been part of the landscape for many years and often raise the same, or similar, issues as non-digital transactions. What is new, however, is the scale of transactions and the emergence of new (and disruptive) players transforming production processes and industries, including many that were previously little affected by globalisation.

6. In much the same way that reductions in transport and coordination costs enabled the fragmentation of production along global value chains (GVCs), falling costs of sharing information – relaxing in turn some of the traditional constraints associated with engaging in international trade, be this asymmetric information, hold-ups or contract enforcement – are powering this digital trade revolution. Services can now be fragmented across national borders, through collaborative processes, and delivered via digital platforms as never before. At the same time, falling informational barriers, arising from growing digital connectivity, are enabling more physical, or traditional, trade to take place, increasing access to foreign markets for firms in a way that would previously have been unimaginable, particularly for SMEs.

7. But digital trade also presents significant challenges for policy makers and businesses. For example the intangible nature of digitalised services has created strong fiscal incentives for their source (country of origin) to be located wherever that may be most advantageous. Digital trade is also further blurring already grey distinctions between conventional cross-border trade in services

(GATS Mode 1), consumption abroad (Mode 2) and services provided through foreign presence (Mode 3), and posing new challenges for the way international trade and investment policy-making is made and how international trade, especially services, is measured.

8. In addition, significant income streams can now be generated through data itself, the collection and dissemination of which is subject to a myriad of national laws, for example, governing privacy. Data flows – even though generally not recorded in international trade statistics, particularly intra-firm transactions – underpin modern trade, including by enabling corporations to manage global production networks under GVCs and in automation for trade facilitation. Hence impediments to data flows can impact how and whether trade takes place.

9. But, despite the growing importance and new policy demands, little empirical, and internationally comparable, information currently exists on digital trade, inhibiting a full understanding of the scale of some of the policy challenges and its contribution to growth.

Towards a typology of digital trade

10. While there is no single recognised and accepted definition of digital trade, there is a growing consensus that it encompasses digitally enabled transactions in trade in goods and services, whether digitally or physically delivered. Whilst all digital trade is enabled digitally, not all digital trade is digitally delivered (an issue which matters given differing rules and commitments under GATT and GATS).¹

11. Data flows, supported by hard and soft infrastructure, ranging from cables and wires to data flow regulations (digital trade enablers), support trade transactions. Data flows underpin the digital trading environment which can be decomposed into a number of distinct categories of transactions (Figure 1), each of which raises different questions for trade/investment policy and measurement: foreign goods or services purchased via a foreign on-line intermediary; foreign goods or services purchased via a domestic on-line intermediary; domestic goods or services purchased by a foreign on-line intermediary; and domestic goods or services purchased by a foreign-owned domestic intermediary.² Moreover, data flows underpin trade less directly, by enabling control and coordination along international production networks, or by enabling implementation of trade facilitation measures.³

12. Digital trade involves both physically delivered and digitally delivered trade: digitally enabled purchases of e.g., software, e-books, data or database services; or digitally enabled but physically delivered goods and services (such as a purchase of a good on an on-line marketplace or the booking of a hotel through a matching service). This distinction facilitates a deeper analysis of

¹ It is important to note that there are many different concepts which refer to digital trade or electronic commerce. The OECD definition of an electronic commerce transaction (OECD Guide to Measuring the Information Society (2011) is the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders. The WTO's working definition is extremely broad: "electronic commerce is understood to mean the production, distribution, marketing, sale or delivery of goods and services by electronic means" (WT/L/274, dated 30 September 1998). The typology of digital trade in this paper aims to focus on the most salient points from the perspective of analysis and measurement. For the typology, digital trade may involve, for example, physical goods as well as products and services that can be delivered digitally; that is, delivery as well as payment may be offline or online.

² This encompasses purchases enabled through on-line platforms direct from producers (i.e. not through an intermediary).

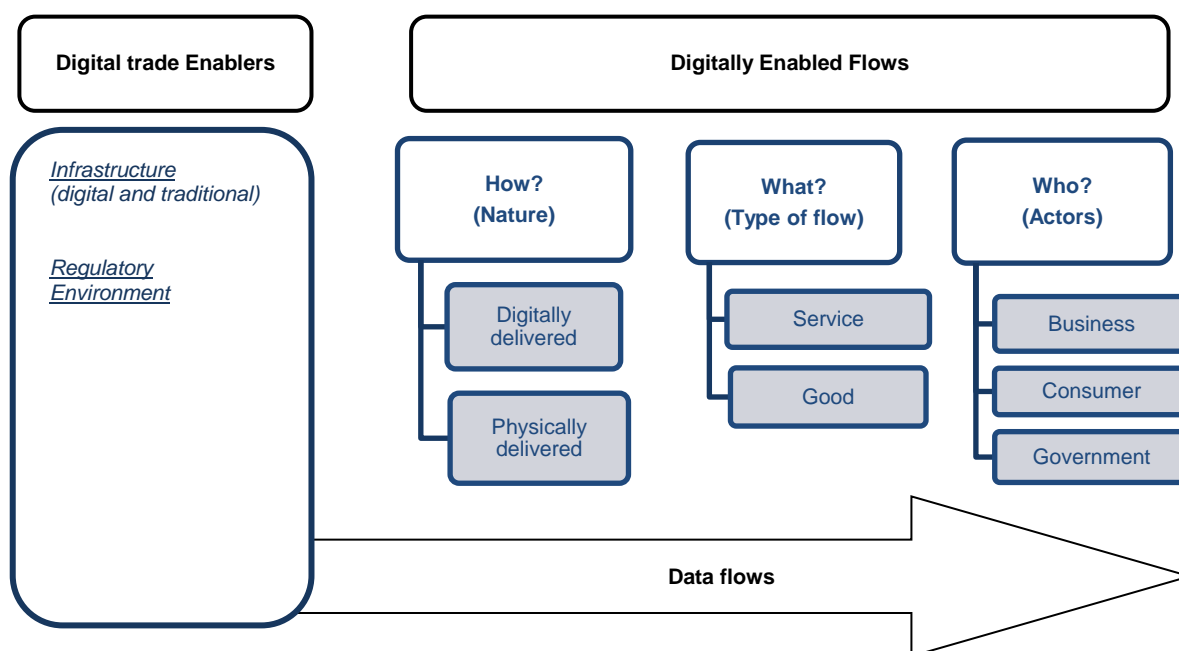
³ Data flows also importantly underpin much of the production of goods and services -- for instance to organise input flows of goods and services, working with subcontractors and suppliers, and even handling in-plant production (i.e. which increasingly involves employees working alongside robots, so-called 'cobot') -- which of course raises issues that go beyond trade or trade policy.

transactions and a tentative typology of digital trade (Figure 1) predicated on the starting point that digital trade is underpinned by data flows that enable trade in goods and services.⁴

13. Thinking more broadly about the development of a measurement framework, it is also important to consider the actors. In this sense, while traditional trade, at least before the advent of GVCs, mainly involved business-to-consumer (B2C) transactions and GVC trade introduced growing business-to-business (B2B) interactions, digital trade has helped to accelerate GVC trade and opened up new avenues for businesses, consumers (households) and governments to interact.

14. Figure 1 below, brings these components together to provide a simple overview of a tentative typology for digital trade that could form the basis of a measurement framework – the How (whether physically or digitally delivered); What (the object of the flow or transaction) and Who (the actors).⁵

Figure 1: A tentative typology for digital trade



⁴ In this respect it is important to note that although the underlying data flows may not be necessarily recognised or recorded as trade flows, in existing international standards of trade statistics (since they are often not associated with a monetary transaction), their disruption or restriction can prevent digital trade from happening or determine how that trade takes place.

⁵ The typology does not aim to define digital trade for the purposes of negotiations; rather, it aims to assist in both the development of a measurement framework for digital trade and to provide an analytical tool to assist in unpacking and understanding digital trade transactions.

Unpacking Digital Trade

15. The proposed typology can help illustrate different interactions which characterise digital trade and identify measurement and trade policy related issues (Table 1). However, it remains an initial proposal and a basis for further discussion as it is already clear that further refinements may be necessary to articulate the classification of new trends. Moreover, in terms of measurement, it will be important to understand where the transactions involved are recorded. If in the national accounts, what part of the transaction is recorded as international trade statistics, what part is recorded as domestic activity, and what part is not recorded at all, e.g. the value of data flows?

Table 1: Using the indicative typology to think about digital trade

Example	How?	What?	Who?	Trade issue	Measurement	Horizontal Issues
Amazon (DVD purchase)	Physically delivered	Good	B2C (often SME) C2C	GATT, in relation to the item;	Captured in trade statistics (depending on <i>de minimis</i> rule in place) but collaboration with business needed to determine how much of this trade is digitally enabled.	Data transfers, Infrastructure (access to and speed thereof), e-payment platforms, statistical classification of service, sector of sale or nature of actual activity? Interoperability, privacy regulation
TradeKey (purchase of intermediates; e.g., synthetic fibre for textile maker)	Physically delivered		B2B	GATS in relation to the intermediary Trade facilitation		
Ride-sharing services (Case 1)	Digitally delivered or Physically delivered	Service	B2C	Domestic regulations / disruption, GATS commitments	Transport service in principle but ride-sharing company provides platform and insurance services. Mode of delivery unclear.	
3D printing (Case 2)	Digitally delivered or Physically delivered	Service or good	B2C B2B	GATS or GATT commitments? interoperability, IPR, competition policy.	Hard to identify transaction. Classification issues if considered as services.	

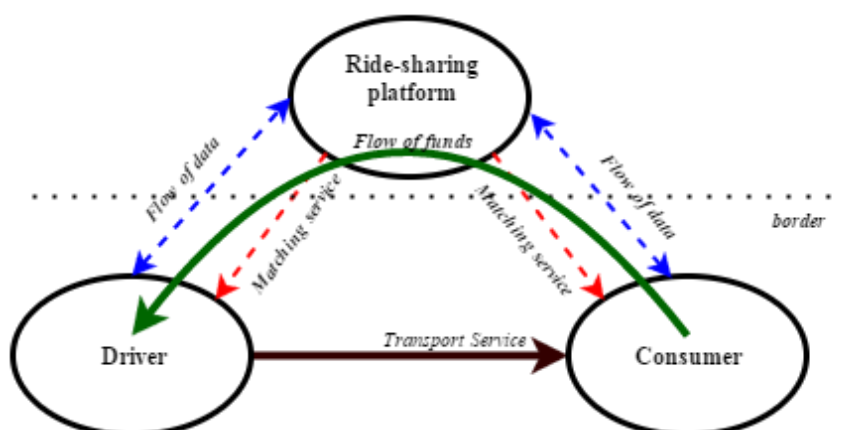
16. Indeed further refinements may also be needed to consider whether transactions should be unbundled for measurement, with consequential impacts for their classification in the typology. To illustrate, it's useful to unpack possible examples of a transport transaction undertaken through a ridesharing digital platform (Case 1), and to consider the issues raised by 3D printing (Case 2) and by online networks (Case 3).

Case 1. Trade in ride-sharing services

At its most basic, a ride-sharing service involves the purchase of a transport service, but how the service is provided determines whether or not there is a trade transaction and importantly how this transaction is to be measured. The example below is just one possible way that such transactions can take place and is presented for illustrative purposes.

In the “physical world”, a taxi would have to pass in front of a customer who would pay for the ride in cash or by card. The ride-sharing matching platform adds a new tradable digital service enabling the transaction by matching the car driver and the customer and managing payment (Figure 2). The transaction between the driver and the rider (consumer) takes place in a particular country, but the supporting transactions, the provision of the matching services, payments and insurance cover, are potentially provided from another country (assuming, as in this example that the ride-sharing platform is not operating through a mode 3 local presence). The unpacking reveals two other components – a payment made to the platform reflecting its intermediation role, and a payment to the driver who ultimately provides the transport service. Arguably the former service could be considered ‘digitally delivered’ and the latter ‘physically delivered’.

Figure 2: Transactions involved in ride-sharing service



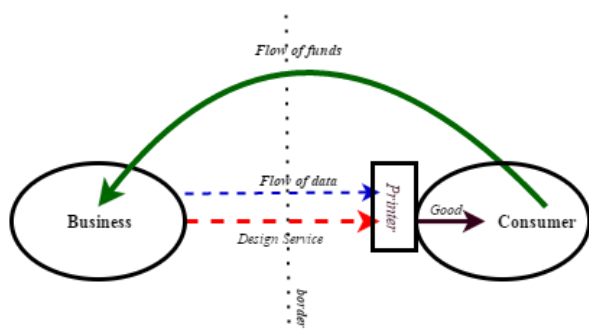
Note: The figure is schematic and to be used for illustrative purposes, it does not purport to reflect how ride-sharing businesses are run.

This raises several important issues for trade policy. For example, since a ride-sharing digital platform owns no cars, should these activities be classified as a transport service or a business service? If it is a transport service, then its operations are subject to GATS mode 3 commitments if a business service, then its operation is subject to mode 1 commitments in the business service sector.

Case 2. 3D printing: trading goods or trading services?

3D printing, or additive manufacturing, is the process of superimposing layers of material to create structures from computer-aided design (CAD) files using a 3D printer. Although not new, 3D printing costs have fallen considerably, resulting in a wider uptake by businesses and consumers. 3D printing shortens design-to-product times by moving manufacturing closer to consumption, thereby helping reach new markets faster. It reduces the costs of building complex and customised structures; to date, it involves trade in low volume specialised products, but has the potential to fundamentally alter the geographical location of international production (see Kommerskollegium, 2016). At these early stages, the implications of this new technology are hard to pin down, but its growing adoption raises considerable trade policy and measurement challenges.

Figure 3: Simple 3D printing transaction



At its most basic, digital trade in 3D printed goods is similar to digitally delivered transactions: it involves a business producing and sending a CAD file to a printer in another country (Figure 3). The cross-border transaction consists of a digitally delivered design service rendered into a product in the country of delivery. The international trade rules that apply to this product are uncertain: on one hand, in a 3D printing transaction delivered directly to the consumer, it is a design service which crosses the border which implies that GATS rules should apply; on the other hand, ultimately, this service produces a good so the transaction could also be

considered a digitally delivered good and therefore subject to GATT rules.⁶

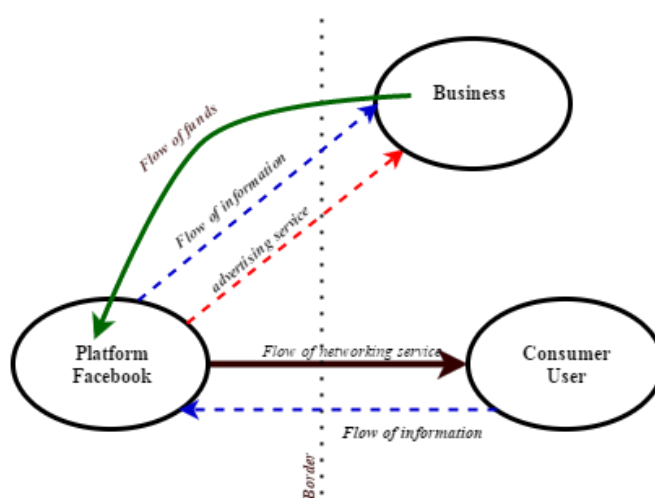
However, 3D printing transactions can also take different forms. For example, 3D printing may take place through an intermediary platform, where the business would place its design on the platform, where the consumer would purchase it and subsequently print the good increasing the transactions associated with the 3D printed good and possibly adding a cross-border flow of matching services. Alternatively, 3D printing may involve the consumer accessing the printed good via an outsourced print-shop, in which case the cross border transaction involves a B2B service link rather than a direct B2C transaction (adding an additional service to the final delivery of the product). Ultimately, and much like in the case of other digital trade transactions, the form of delivery determines both the trade policy context and the measurement implications.

⁶ If GATT rules apply, there is also a further issue of whether the low-volume transaction falls within de minimis provisions and therefore whether it is to be recorded or whether tariffs are payable in the receiving country. Further complications arise if the provider of the design provides it as a bundle that includes provision of the goods components whether as cross border trade or through exports.

Case 3. Social networks, Facebook-type transactions

Social networks, such as Facebook, also raise several important issues. While the delivery of the social networking service is similar to a traditional digitally delivered service, the transaction between the producer of the service and the consumer, or user, is not directly monetised. The delivery of the social networking service requires data to be transferred to and from the consumer. Facebook then uses this data to generate revenue through selling targeted advertising space, and hence it is the delivery of the social networking service through the platform which enables the monetisation of the activities of the social networking site Facebook (Figure 4). In this instance, one of many possible ways, the B2C delivery of networking services is supported by transactions involving a B2B digitally delivered advertising service.

Figure 4: Social networking



A classification issue arises from the fact that Facebook is not directly drawing revenue from its principal activity. While Facebook might be classified as a company that provides social networking services, in actual fact its revenue is entirely drawn from providing advertising services. This decoupling of payments is also an increasingly common characteristic of digital trade where services are provided but not necessarily directly monetised (twitter or gmail are other such examples).

Further complications arise when considering broader modes of financing, across the plethora of social media and digital platforms that currently exist. For example, advertising is not necessarily the only source of revenue and data on consumers' behaviour may directly be sold on to third parties.

Challenges in measuring Digital Trade

17. While some of the issues are not new, digital trade raises complex issues for measurement and indeed for the underlying accounting framework. B2C, cross-border, digitally enabled, goods transactions appear to be rising and the tools that have typically been used to capture these flows, which generally assumed small scale activity, may no longer be sufficient. Moreover, significant intra-firm flows of data, underpinning knowledge and the provision of knowledge-based services, may go completely undetected in conventional trade statistics, raising concerns not only for trade measurement but also for measures of GDP. Additionally, the channels used to provide digitally enabled services are increasingly blurring the line between the various modes of supply, meaning that international trade occurs if the provider is located abroad but not if an affiliate in the host economy is present, again raising questions about GDP; more significant challenges are presented

when the location of the service provider is also determined by fiscal optimisation strategies. There are also questions concerning the classification of the various services provided (i.e. which service), which may vary among countries. Perhaps the biggest challenge, however, concerns the provision of free services to consumers, financed by advertising models or indeed financed by the acquisition of data on consumers that is sold to third parties.⁷

18. In the ride-sharing case (Case 1) the 2008 System of National Accounts for example (# 14.126) specifies that the service provided should be recorded as trade in transportation services, with the ride-sharing platform consequentially classified in the transport sector, but it is not clear that all countries follow this, nor indeed whether the same rules of classification necessarily govern that used to determine its classification for trade purposes.

19. The ride-sharing example also illustrates some of the further measurement challenges with digital trade, i.e. where are transactions recorded, and where should they be? The platform matches consumers and drivers who each pay an intermediation fee for matching supply to demand, made particularly complicated by the fact that the flow of funds does not align with the underlying flow of services (Figure 2). In theory, it would appear, that the only figures that should be recorded in official international trade (in services) statistics should be the intermediation fees (the margin) charged by the platform, recorded as imports by drivers and consumers (and which in theory should be recorded as a digitally delivered service). Having said that, one cannot rule out the possibility that the transaction reflects 'merchandising of services', which would implicitly mean that the platform was considered as the purchaser of the transportation services that were subsequently sold on to consumers (in which case the service could be considered physically delivered).

20. Moreover, official trade statistics also do not necessarily capture similar transactions facilitated by foreign affiliates. This is the other complicating feature of ride-sharing or platform intermediation transactions. The platform may not be cross-border and instead the intermediation services may be provided by an affiliate, meaning that the related transactions are purely domestic. This, in turn, raises questions regarding the delineation of services (trade) and income (investment) flows. This matters because, increasingly, services produced and consumed within domestic borders (and indeed goods) are being facilitated by foreign (and foreign owned) intermediaries.

21. Regarding *digitally delivered services* (and data) significant improvements were introduced in the latest revision to the international classification system used to record trade in services (EBOPS⁸ 2010), particularly concerning services likely to be delivered digitally, such as information services, research and development and intellectual property. Such data could form the basis of first order estimates of digitally delivered services trade. However, not all countries have currently moved to this new classification system. Moreover, these transactions may not be visible in international trade statistics when they are conducted as intra-firm transactions, and where they are visible it may reflect fiscal optimisation strategies rather than economic reality from a national accounting perspective.

22. But perhaps the biggest measurement challenge for digitally delivered services concerns those flows which do not result in a monetary transaction per se, but may support one (such as generating advertising revenue). For example, in the Facebook example (Case 3) there is no monetary transaction between Facebook and the user (and in terms of existing international standards, no trade); that is, while the advertising revenue monetary flow is captured in trade statistics (where the flows are cross-border), the information flows upon which they depend are not (Figure 4). It is clear that this raises issues concerning consumer surpluses and indeed at the international level who is ultimately financing those surpluses. For example, free digital products

⁷ There are also other challenges that sit outside of the current measurement frameworks (System of National Accounts and Balance of Payments Manual); for example, there is growing demand to better understand take-up and use of digitalisation by firms as enablers of productivity and competitiveness.

⁸ Extended Balance of Payments Services Classification

(such as Facebook) are in general available to all with sufficient bandwidth, but the funding model (advertising) does not discriminate between countries. In other words, advertisers (and ultimately consumers through paying higher prices) in one country may be indirectly generating consumer surpluses in another.

23. In a similar manner, and because they are free, the international accounting system does not in general impute transactions related to the use of public goods (such as open-source or free software). Again this raises issues concerning the measurement of consumer surpluses but also potentially policies, such as anti-dumping and competition policies, if the freely available software is designed to gain market share with a view to the introduction of subsequent priced models.

Table 2: Measurement Challenges⁹

Measurement Issue	Description	Example	Impact
Underestimation	De minimis provisions imply that small value transactions might not be recorded.	Cross border conventional e-commerce transactions of goods or services	Trade statistics may be underestimated (goods and services)
Classification (of activity)	The digital trade flow can be classified across different sectors.	Is a ride-sharing transaction a transport service or an intermediation service?	No impact on recorded trade statistics but allocation differs by product and activity
Classification (of mode of supply)	The underlying service may be provided by a foreign affiliate	Multinationals have scope to record digitally enabled trade as either cross-border trade or primary income flows.	All flows are in theory captured either as trade or as primary income but 'distortions' may occur to GDP depending on how the flows are recorded.
Location of service provider	The provider of the services may be located in any territory	Fiscal optimisation may determine headquarters of firms and in turn the provision of services.	Trade statistics will, in theory, record these flows but interpretation difficulties may occur as profits are shifted.
Non-monetary	No monetary transactions resulting	Social networking sites where the underlying information flows support other economic activities - Case 3	All revenues arising from the provision of advertising services or sales based on data will, in theory, be captured in the statistical system; however, challenges arise concerning the implicit consumer surpluses that may be gained
Identification (of digitally enabled transaction)	Information on the use of digital services to enable trade transactions	SMEs using digital intermediaries to export	Expenses of firms on digital services will be captured, either as a domestic or international transaction, including on own-account (if the case), but the scope of accounting frameworks are not set up to identify sales enabled through use of digital tools.

24. From the point of view of current international accounting standards, it is not generally felt that there are conceptual gaps in the frameworks. In addition, at present at least, the indications are that overall values of international trade do not significantly under-record digital or digitally related trade although, as noted above, there may be (mis)classification issues related to trade in services and primary income flows; particularly concerning transactions related to knowledge based capital. That said, it is also generally recognised that statistics on digital trade are not sufficiently visible in a way that can adequately meet growing policy needs, nor indeed to fully address the concerns of those who feel that the current statistics on international trade are deficient.

⁹ While a number of these measurement challenges also arise in the offline world (e.g., service trade statistics do not yet distinguish flows by mode of supply), they are also, or particularly, relevant for digital trade. For example, underestimation of trade may be increasing as shipments ordered online include more small parcels.

25. Moreover, little is known about the extent to which firms (particularly SMEs) use digital channels (whether through intermediaries or their own sites) to sell goods and services. In addition, a significant grey area remains on the operations of multinationals (conventional multinationals and digital intermediaries such as AirBnB and Amazon) and their ability to either record services or primary income flows depending on how they deliver services (to third parties or intra-firm). And it is not clear that consistent treatment of the underlying flows exists across countries, affecting not only estimates of international trade and investment flows but also GDP.

Moving forward on digital trade

26. First, it is proposed to launch an initiative to improve our collective understanding of the scale and scope of digital trade. Whilst the concept of digital trade has only recently entered the mainstream as a subset of broader measurement of the digital economy, there is a base of existing work upon which to build¹⁰, as well as a number of new initiatives by the international statistics community that have, at least in part, helped to improve statistics on digital trade.

27. While resolving the information gaps will not be easy, the growing importance of the issue has provided momentum for improvements. In addition to the changes to EBOPS for *digitally delivered* services, for *digitally enabled* trade, UNCTAD, the Universal Postal Union, OECD and the WTO have recently set up a Technical Group to measure cross-border e-commerce transactions.¹¹ There are other relevant ongoing efforts that can be built upon, such as on cross-border e-commerce¹² and in respect of ICT enabled services¹³.

28. The OECD tabled a summary issues paper at the 10-11 October, 2016 meeting of the Inter-Agency Task force on International Trade Statistics¹⁴ which received positive feedback and support for the development of a more refined measurement framework for digital trade and an accompanying issues paper by the end of the year. This is an important step in building the capacity of the international statistical system to measure digital trade in sufficient detail to support informed policy making.

29. Second, as one part of the OECD horizontal project on the Digitalisation, work is underway both to develop further the tentative typology of digital trade and, notwithstanding the limits on currently available data, to begin to explore digital trade policy issues (both impediments and opportunities), such as those related data localisation measures.

¹⁰ For example, the OECD has been collecting statistics on e-commerce (B2B, B2C, C2C both within-country and cross-border) for many years through two OECD Model Surveys on ICT usage: one by households and individuals and the second by firms. The OECD, UNCTAD, UPU and WTO, are also part of the Technical Group working to better measure cross-border e-commerce transactions (see below). See also *Measuring the Digital Economy* (OECD, 2014).

¹¹ And a parallel train of work is being led by the OECD and IMF in response to a G20 request on measurement of the digital economy within macroeconomic statistics.

¹² UNCTAD (2016). *In Search of Cross-Border E-commerce Trade Data*. UNCTAD Technical Notes on ICT for Development No 6. UNCTAD (2015). *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 No 3.

¹³ In March 2016, the UN Statistical Commission endorsed a definition of ICT-enabled services developed by UNCTAD in collaboration with other international organizations that will help derive data on the value of services actually delivered electronically across borders.

¹⁴ OECD, UN, Eurostat, WTO, UNCTAD, IMF, UNWTO