**13th Meeting of the Advisory Expert Group on National Accounts,
1-3 October 2019, Washington D.C., USA**

Agenda item: 2.3.2

Progress on the Digital Supply-Use Tables Framework

Introduction

In November 2018, the Advisory Expert Group (AEG) on National Accounts reconfirmed the three priority areas for the SNA research agenda as globalisation, digitalisation, and economic well-being and sustainability. The AEG identified specific issues to be taken forward in the short term within those areas. The AEG agreed to launch work streams under each of the priority areas, led by AEG members, to develop guidance notes for each (group of) specific issue(s). The attached draft regarding the conceptual framework for a set of Digital Supply-Use Tables (digital SUTs) is a first draft version of the aforementioned guidance note.

The framework of digital SUTs, of which a draft version was presented at the 2018 AEG meeting, creates an avenue to provide information on various digital indicators aligning with the 2008 System of National Accounts (SNA). Over the past twelve months, the OECD Informal Advisory Group on Measuring GDP in a Digital Economy (Advisory Group) has further improved the digital SUTs, taking into account extensive feedback from various constituencies. The latest version is included, as a separate document, under this agenda item.

Various papers referring to the Digital SUTs have been disseminated this year. However, they predominately outline the specific details of the framework, and how countries may compile the relevant tables. The draft guidance note will provide background to the issue and address specific concerns on how the framework does or does not align with the 2008 SNA and its impact on other statistical frameworks and classifications.

Documentation

●   AEG guidance note "Digital Supply-Use Tables", draft prepared for Advisory Expert Group (AEG) meeting, 1 – 3 October, 2019, Washington D.C.

Main issues to be discussed

The AEG is invited:

    ●   To reflect on the draft and offer their views on any improvements, or raise issues and topics that might be lacking from the current draft of the guidance note.
    ●   To suggest improvements to the proposed structure of the guidance notes in order to generate most value added to users.

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AEG Guidance Note : DRAFT

Digital Supply-Use Tables.

1. Introduction to the issue

Digitalisation has allowed firms to radically alter production processes and their access to markets using digital tools. At the same time, digitalisation has permitted consumers to access a larger variety of goods and services, while exercising greater control over the characteristics of the transaction.

Despite digitalisation being overtly present in our professional and personal lives, it is not nearly as identifiable in the various indicators currently used to measure the economy. This absence of specific information on such a key trend within the economy continues to create confusion about what is (and is not) being included and who is (or is not) benefiting from these changes.

This confusion has, at times, been used as evidence of possible mismeasurement, creating disagreement on whether aspects of the digital economy are, in fact, missing from macro-economic statistics rather than being simply difficult to identify. The overall debate on the measurement of digital activity has highlighted the absence of statistics that explicitly reveal the benefits to consumer welfare or the role of digitalisation in the economy.

The significance of the issue has added to the confusion. Papers have argued that, as currently defined and measured, the effect of digitalisation is to understate levels and growth of economic activity, and may therefore be one of the reasons for the observed productivity slowdown (Coyle, 2017; 2018). While other research has shown that, the productivity slowdown cannot be explained simply by mismeasurement of economic growth brought on by digitalisation (Ahmad et al, 2017; Ahmad and Schreyer, 2016).

An estimate of the size is further complicated due to the lack of set definition regarding what is and is not included in the digital economy. A narrow definition, such as the established ICT sector classification, it is a relatively straightforward exercise; however, if defined to includes areas of the economy where digitalisation has impacted consumption such as E-commerce, online platforms and providers of free services, then estimating the size becomes a trickier affair. Furthermore defined from an input perspective, based on the "use of digitized data", it could, as stated by the IMF "encompass an enormous, diffuse part of most economies, ranging from agriculture to R&D" (IMF, 2018). Finally, estimates of the size also depend on the treatment of digital transactions that are currently outside the production boundary, this includes activities such as, the provision of zero-charge digital services or household production of data.

This guidance note predominately addresses the measurement of the first two components. The third definition is considered not statically practical due to the all-encompassing nature of the definition. Academia has focused heavily on the forth perspective, with various hypothetical growth estimates created, based on if the production boundary was altered, while the Digital SUTs includes the potential for these to be included, these subjects will be explicitly addressed in other complimentary guidance notes.

The proposed framework outlined in this note does not define the digital economy and indeed the framework does not advocate a single measure of the digital economy. This is deliberate, and reflects the fact that the tables are designed to meet a multitude of needs and demands, which cannot be met by any single measure. Rather, it defines a range of products and actors at the core of digitalisation in the economy. In doing so, it produces statistics on digital activities that can assist the development of appropriate policy as well as facilitate international comparison between countries. Additionally, it provides insight in how specific elements of the digital economy, which may have been considered to be missing or underrepresented within the national account aggregates, are accounted for.

2. Existing material

The word digitalisation does not appear once in the 2008 SNA, in fact, even the word digital only appears twice and this is in relation to digital cameras. This is not surprising as not only was the infiltration of digitalisation in the production process in its infancy when it was written but the measurement of digitalisation is as much a practical issue as a conceptual one.

Unfortunately, due to the lack of useful indicators or explicit outputs quantifying the value added of transactors in the digital economy, users have assumed that their absence is due to a lack of guidance in the SNA. In reality, the absence of identifiable outputs is due more to the insufficiency of the industry and product classifications used to compile the accounts, than the SNA itself.

This is not to say that NSOs have not been trying to generate these statistics. Demand for information on digitalisation has been building for some time and in response, statistical organisations have undertaken new work to try to capture the size and impact of digitalisation in the economy. The most basic approach for measuring digitalisation is by simply surveying households and business on their level of digital activity[1]. By including additional questions on population or business surveys, for example, countries have been able to produce indicators on the use of sharing platforms or purchases made online[2]. While the level of digital saturation in our daily lives and work is of interest, this metric does not produce a monetary estimate of the level of production associated with digitalisation or quantify any efficiency gains observed due to the changing production process.

In an effort to estimate an amount of value added that has come from digitalisation, some countries delineated certain products and the industries producing them as digital. By summing the production of these products and industries, countries were not only able to arrive at a total estimate of the "digital economy", but did so while still remaining consistent with their existing (and SNA aligned) economic indicators.

The result of this work showed the average growth rate of the "digital economy" as significantly higher than the respective growth rate of the total economy in each country (Barefoot et al, 2018; ABS, 2019).

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[1] See Eurostat database on E-commerce activity, available at https://ec.europa.eu/eurostat/web/digital-economy-and-society/data/database

[2] See Statistics Canada, Digital economy survey available at https://www150.statcan.gc.ca/n1/pub/11-627-m/11-627-m2018028-eng.htm#moreinfo and CBS, Netherlands, ICT usage in households and by individuals, 2018 available at https://www.cbs.nl/en-gb/news/2018/51/increase-in-online-shopping-among-older-generation

While these results identified a previously unknown estimate and were a significant step forward in attempts to measure the impact of digitalisation, this simplified piecemeal approach limited the ability to compare data internationally.

In response to user demands as well as the initial work being undertaken by NSOs, the informal advisory group on measuring GDP in a digitalised economy developed a statistical framework for Digital Supply-Use Tables (Digital SUTs) (see, OECD, 2018). These tables produce indicators on digital activity in the economy that are aligned with current macro-economic statistical standards. By breaking down the supply and use of these products by the nature of their transaction, the framework extends on previous work undertaken on the digital economy, by highlighting how digitalisation has affected the provision of traditional products as well as digital products. Furthermore, by classifying units to specific categories based on how they are leveraging the digitalisation occurring, estimates of production by defined "digital industries" can be produced.

Variations of this conceptual framework and its operationalisation into a supply-use framework have been presented at various fora, including the 2018 advisory expert group meeting.[3] Discussions within these different fora and groups have helped reach agreement on the basic specifications of the framework and helped define the specific product and industry definitions needed in a supply-use framework.

3. Options considered

With the exception of any movement in the production boundary to explicitly include various zero-cost digital services or data used in the production process, the Digital SUTs is unlikely to require any fundamental changes to the SNA. Rather the selected option on how best to identify and measure digital activity in the economy might require additional information in the SNA in order to provide greater clarity on how to classify digital transactions. More likely however, is that this information is included in other complimentary standards and classifications.

The options on how to measure the digital activity is intrinsically linked to how the digital economy is defined. A narrow definition might include all production coming from a finite amount of enterprises, chosen due to their digital characteristics. Alternatively, it could be defined and measured along product lines, with a specific set of goods and services classified as digital products, this has been the method previously undertaken by several NSO's. Finally, the digital economy could be defined as output coming from any production that utilised digitisation, requiring the measurement of all value added where digital products were used as an input.

The first two proposals would be more feasible for national statistical offices but would not meet various user requirements. There is already established classifications for ICT in both the international industry (UNSD, 2008) and product (UNSD, 2015) classifications and while these make up an important

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[3] In the past 12 months papers and presentations based around this framework have been presented to; the Advisory Expert Group (AEG) on National Accounts, the General Conference of the International Association for Research in Income and Wealth (IARIW), the ESCoE conference on economic measurement, the UNECE Group of Experts on National Accounts, and the OECD Working Party on Measuring and Analysis off the Digital Economy.

part of the digital economy (and of the Digital SUTs), they ignore industries, products and transactions that have been significantly impacted by digitalisation. A classification that looks only at the product and/or the producer in a binary digital, or non-digital way, would be unable to apportion services that are provided both digitally and non-digitally such as take-away food, gambling, education and accommodation to name just a few.

The third option mentioned, based on the use of digital products as an input to production, would likely prove statistically unhelpful due to the proliferation of digitalisation across the economy. Almost all production in the modern economy involves some form of digitalisation and therefore a delineation based on this would prove too large to provide meaningful information.

The option proposed in this guidance note includes a conceptual framework that records the various products and actors involved in the digital economy, but most importantly also identified the nature of the transactions between the actors (see figure 1).

Figure 1. Conceptual framework for measurement of digital economy
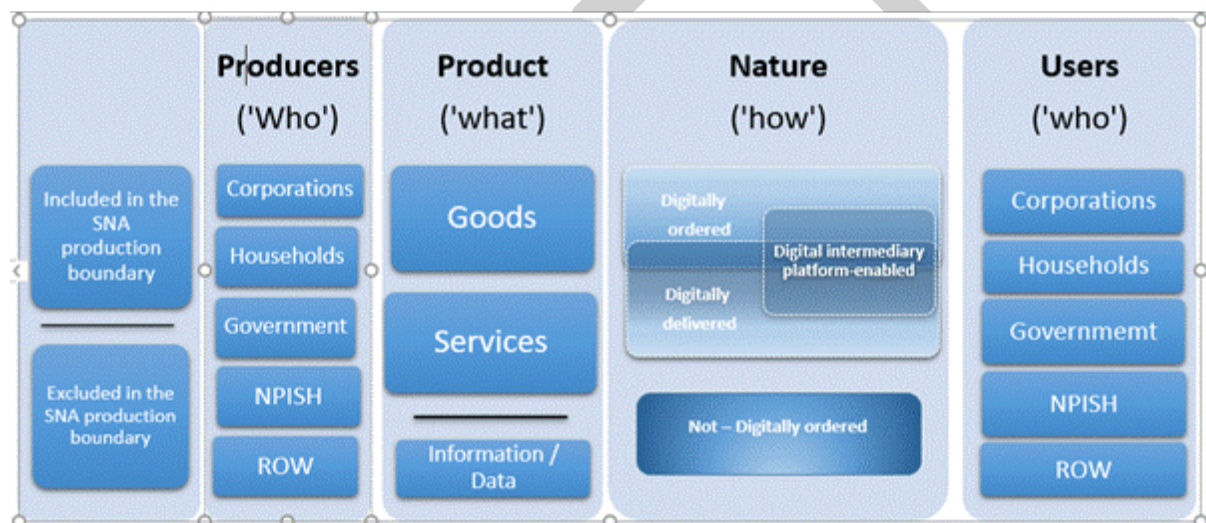
The framework would produce a set of Digital SUTs; these tables would contain indicators on digital activity in the economy that are aligned with current macro-economic statistical standards. By breaking down the supply and use of these products by the nature of their transaction, the framework extends on previous work undertaken on the digital economy, by highlighting how digitalisation has affected the provision of traditional products as well as digital products. Finally, by classifying units to specific categories based on how they are leveraging the digitalisation occurring, estimates of production by the "digital industry" can be produced.

4. Recommended approach – conceptual aspects

A fundamental principle of the framework is that transactions are in scope of the digital economy if they are digitally ordered and/or digitally delivered, Units are then classified to specific industry categories based on characteristics related to the transaction nature or how they are leveraging the

digitalisation occurring. This would allow for estimates of the value of production by specific "digital industries" defined within the framework.

While the nature of the transaction will assist in classifying some existing units from the conventional industry classifications, some industry and products will be aggregated regardless of the nature of their transactions. This recognises that many transactions, for example, purchases of digital enabling tools (such as computers) or outputs of digitally enabling industries are also essential components of the digital economy.

To allow this additional transaction classification to be represented the conventional supply-Use tables have been modified. The modifications include:

- Five additional rows under each product (and aggregates of products), representing the nature of the transaction.
- Seven additional industry columns, representing the new "digital" industries.
- Four additional rows, representing digital product categories that fall within the SNA production boundary.
- Three additional rows, representing data and digital services currently outside the SNA production boundary.

By beginning with the conventional SUTs, the framework aligns itself with the broader conceptual classifications used in the SNA, hence why no change to the existing SNA text will be necessary. Use of this framework also maintains a consistency between attempts to measure domestic production affected by digitalisation and the approach to measure digital trade where digital trade transactions are defined as those that are digitally ordered and/or delivered[4].

The digital industries and products listed in the framework are not currently part of the any existing classification. Rather they are aggregates or components of already existing classifications. Units are classified to specific industry categories based on characteristics related to the transaction nature or how they are leveraging the digitalisation occurring. For example, digital intermediary platforms play a very specific role within the digital economy regardless of the fundamental good or service that they are intermediating, the units fulfilling this role may currently be classified to many different ISIC units, even though from a digital economy perspective, they all provide a similar service. In the Digital SUTs therefore, all intermediary platforms would be aggregated together within the one industry.

It should be noted at this point that the framework proposed is not restrictive, the setup of the digital SUTs do not preclude countries, if deemed relevant to them, from producing breakdowns that are more specific. This would allow them to fulfil a policy need, while still allowing the data to be comparable at the aggregate level presented.

While the exact size of aspects of the digital economy is debated, it is likely that the majority of transactions that would be identified in the digital SUTs (and are within the current production

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[4] The concept of breaking up products based on the method of transaction is consistent with those put forward to measure digital trade. This allows for a consistent treatment of digitalisation in both frameworks. For additional information on measurement of digital trade, refer to OECD-WTO Handbook on Measuring Digital Trade (forthcoming).

boundary) are already included within the current SUTs. Due to this, explicitly identifying these would have a minor (if any) impact on the overall levels of GDP.

Aspects of the digital economy that are currently outside the production boundary (such as zero priced digital services and data) are included in the Digital SUTs, but in a delineated area outside of those aggregations consistent with the conventional SUTs. If these transactions were explicitly moved inside the production boundary (this is addressed in another guidance note) then this would have a significant effect on aggregates.

5. Recommended approach – practical aspects

The work already published by NSO's is an excellent start but also a good reference to the difficulties in compiling the digital SUTs. By identifying a specific list of goods and services as "digital", NSO were able to delineate their existing supply-use tables between digital and not. This meant however, that the publications excluded transactions that many people would consider as fundamental to the digital economy, such as

- Purchases of products traditionally viewed as non-digital, even if ordered and possibly delivered online, including education, gambling, and professional services such as accounting and legal services.
- Transactions related to peer-to-peer activities[5].
- Imports of digital products[6].

Pointing out these exclusions is not to criticise the work; measuring the emergence of digitalisation is extremely difficult due to scarcity of source data and agreed definitions. While the digital SUTs presented in this guidance note will assist in describing aspects of the digital economy, it will not make source data any more attainable.

This scarcity of source data is the largest reason the framework presented in this note is considered so ambitious. The framework and indeed the Digital SUTs template that supports it, are designed, in part, to act as road maps that help to motivate the development of new data sources, where these are needed. In this sense it is clear that many, perhaps most, countries, will not currently be in a position to fully populate the tables but they have been deliberately set up in a way that allows for the population of the known components of the digital SUTs now, while also serving as a guide for future developments in the area.

That said, some outputs and indicators within the digital SUTs are considered easier and may be compiled in the short term by breaking down already available estimates in the conventional SUTs or

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[5] While both countries mentioned that these transactions are included in the overall supply-use tables, the ABS in their work stated that for their estimate of digital activity "peer-to-peer transactions and emerging digitalised products….are not included in the estimates" while the BEA "did not explicitly include the value of P2P or "platform-enabled" transactions".

[6] Since both studies were compiled using the production measurement approach to GDP, they do not include any estimates of components of final demand. While production that was subsequently exported is included in the estimates, it excludes imports of digital products.

from already established aggregations (i.e. ICT sector in ISIC). Several countries, for instance, already produce outputs that are components of, or similar to, indicators within the digital SUTs.

Following the meeting of the advisory group on July 1-2, 2019, it has been proposed that, due to the ambitious nature of fully populating the Digital SUTs, and the various levels of data sources and resources available, the OECD Secretariat would put forward a concrete proposal for a set of high priority indicators, for further consultation with the member countries. The proposed list of high priority indicators includes the following: Output, Gross Value Added (GVA) and its components, of digital industries; Intermediate consumption of Digital Intermediary Services (DIS), Cloud Computing services (CCS) and total ICT goods and digital services; expenditures split by nature of the transaction.

The majority of work up to now has focused on confirming the concepts that underpin the framework ensuring that the categories maintain a balance between producing outputs that are relevant to policy makers but still statistically attainable for compilers. The focus now turns to sharing compilation methods and models between countries, this combined with the initial focus on specific indicators from the tables provides an opportunity for initial outputs to be compiled in the short term.

6. Changes required to the 2008 SNA and other statistical domains

In order for the digital SUTs framework to be taken up by the international statistical community, it is unlikely that any existing components of SNA would need to be altered. The design of the Digital SUTs was done in order to be consistent as much as possible with the existing SNA.

Clarity regarding the treatment of digital intermediary services as either a separate product or as a trade margin (requiring a change to the current definition) or additional guidance on specifics of digital ordering and delivery could be added however it is envisioned that this could be appropriately dealt with within the respective statistical classifications that sit alongside the SNA. Certainly, some products such as digital intermediary services and cloud computing services would be expected to be included in the next revision of the product classification.

If so desired, additional language that explains the concepts of the digital SUTs could be added to the SNA in either chapter 14 (*The supply and use table, and goods and services account*) or perhaps more appropriately within chapter 29 (*Satellite accounts and other extensions*). Similarly to the previous point, it is envisioned that these concepts and associated definitions could be maintained within the international statistical community through regular completion of the template and do not require a change to the SNA. This would also allow for the framework and template to be easily adapted in response to changes in this continually developing area.

Any changes made to standards and classifications would have to be aligned with those for measuring digital trade, the development for a framework (OECD-WTO, forthcoming) for the measurement of digital trade has been done in conjunction with the Digital SUTs and shares many concepts and definitions. It is advised that the ISWGNA either directly or with the AEG work together to ensure that classification of digital activity are consistently accounted for in an updates to classification systems.

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