A framework for digital supply and use tables

Regional Course on Supply and Use Tables
Chiba, Japan
20-24 January 2020

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United Nations Statistics Division

Outline

- Why digital supply and use tables (SUTs)?
- Summary of recent work by statistical agencies
- Conceptual framework for digital SUTs
- What the digital SUTs can and cannot do
- Outputs and next steps

Three priority areas of SNA research agenda

SNA research agenda – three priority areas

Globalization

- CIF-FOB valuation of imports/exports
- Economic ownership and recording of intellectual property products
- Treatment of multinational enterprises (MNEs) and special purpose entities
- Intra-MNE flows
- Identifying economic presence and residency

Digitalization

- **Framework for a satellite account on the digital economy**
- Valuation of free assets and free services
- Recording of data in the national accounts
- Crypto assets
- Price and volume measurement of goods and services affected by digitalization

Well-being and sustainability

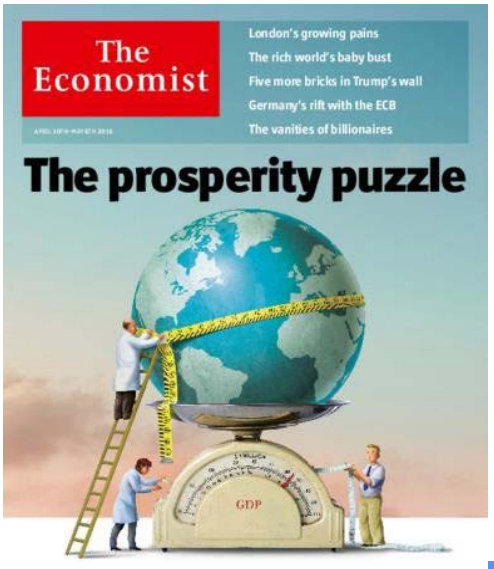
- Unpaid household work
- Environmental-economic accounting
- Distribution of household income, expenditure and wealth
- Education and human capital
- Health and social conditions
- Defining a broader framework for capturing economic activities, well-being and sustainability

Why digital supply and use tables (SUTs)?

Is this what everyone thinks?

"These days it seems that a growing fraction of innovation is not measured at all. In a world where houses are Airbnb hotels and private cars are Uber taxis, where a free software upgrade renews old computers, and Facebook and YouTube bring hours of daily entertainment to hundreds of millions at no price at all, ***many suspect GDP is becoming an ever more misleading measure.****"*

The Economist Apr 30th 2016



Where is the digital economy in macroeconomic statistics?

Digital transformation is **largely hidden in the core economic accounts** and challenges our conceptual frameworks and measurement approaches

- **Production chains** between producer and consumer **are changing**, while the overall value add may remain the same, the current frameworks struggle to show the "winners" and "losers"
- Digitalization can **remove players** (direct online booking) or **add additional players** (intermediary platforms)
- Statistical recording of the production and use of data, including **the 'participative' production of consumers**, digitalization blurs the boundaries between produced and non produced
- The "free / zero cost" services provided by private companies, **how and what to measure?**
- Confusion over what is **Production vs. Consumer Surplus**

Digital activity in the economy…simplified

The "largely hidden" digital activity in the economy is split into one of two occurrences

1. Activity that is **included** but combined within other aggregates so **not currently identifiable**
2. Activity **not included** as it is currently **outside of the production boundary** ("other" digital issues)

The digital supply and use tables attempt to address both these issues

Summary of recent work by statistical agencies

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MEASURING DIGITAL ACTIVITIES IN THE AUSTRALIAN ECONOMY

SUMMARY

Rapid advancements in digital technologies in recent years have transformed the ways in which households
Digital activities have grown rapidly and become an important contributor to economies around the world.
statistical insights into digital activities in Australia for analytical and policy purposes.


Measuring the Digital Economy:
An Update Incorporating Data from the 2018 Comprehensive Update of the Industry Economic Accounts

bea Bureau of Economic Analysis U.S. DEPARTMENT OF COMMERCE

Introduction

The estimates presented in this paper update the initial estimates toward a digital economy satellite account the Bureau of Economic Analysis (BEA) published in the March 2018 working paper titled "Defining and Measuring the Digital Economy."[1] These updated estimates follow the same methodology for measuring the digital economy BEA introduced in March 2018, but they incorporate updated underlying data published during the 2018 comprehensive update of the Industry Economic Accounts.[2] Like the initial estimates, these updated digital economy estimates include only items that BEA has categorized as "primarily digital." Additionally, this paper extends the time series for BEA digital economy estimates to cover the period from 1997 to 2017.

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Latest Developments in the Canadian Economic Accounts

Measuring digital economic activities in Canada: initial estimates

national income Canada statistics economy

Release date: May 3, 2019

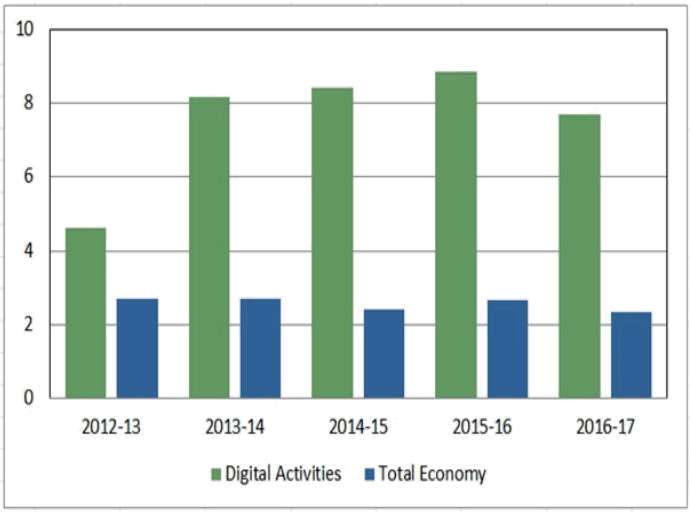
Statistics Canada Statistique Canada

Canada

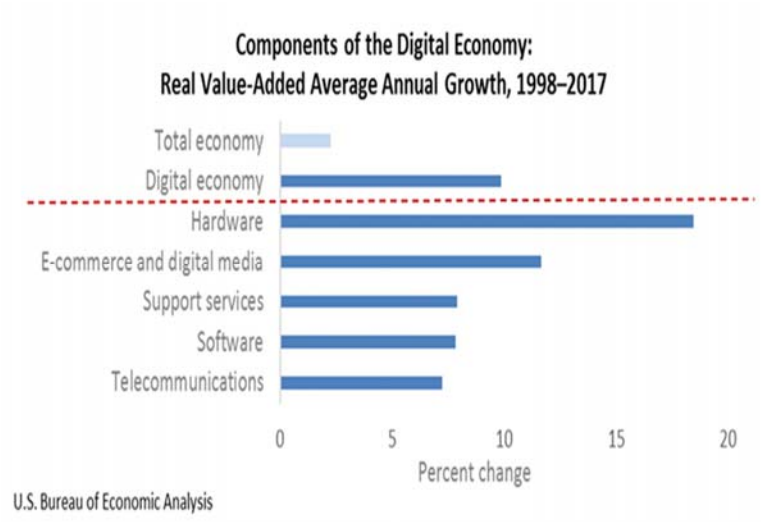
Summary of recent work by statistical agencies

Australia, average annual growth from 2012-13 to 2016-17

- **"Digital Economy"** growth at 7.5%
- Total economy at 2.5%



Summary of recent work by statistical agencies



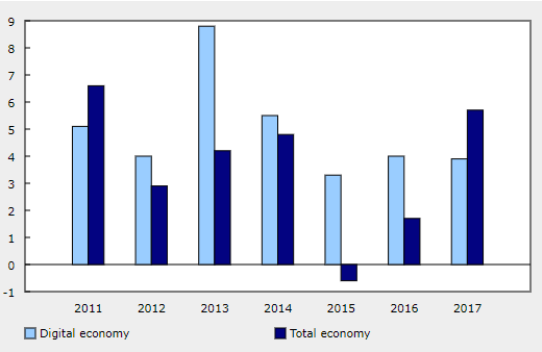
United States, Average annual growth from 1998–2017

- **"Digital economy"** growth at 9.0%
- Total economy at 2.3%

Summary of recent work by statistical agencies

Canada, average annual growth from 2010-to 2017

- **"Digital Economy"** growth at 5.7%
- Total economy at 4.0%



Summary of recent work by statistical agencies

- This work has taken the SUT tables (simplified below) and labelled certain products (and therefore parts of industries) in the SUT tables as digital.
- Digital economy = total GVA of proportion of industries making digital products

Supply & Use Tables		Industries								TOTALS
		Industry A	Industry B	Industry C	Industry D	Industry E	Industry F	Industry G	Industry H	
Product	Product 1									
	Product 2									
	Product 3		DIGITAL	DIGITAL		DIGITAL			DIGITAL	
	Product 4		DIGITAL						DIGITAL	
	Product 5									
	Product 6									
	Product 7									
	Product 8		DIGITAL			DIGITAL				
	Product 9									
	Product 10									
Totals			Total Digital GVA	Total Digital GVA		Total Digital GVA			Total Digital GVA	

Product 3,4 and 8 defined as digital

Sum of total Digital GVA = "Digital Economy"

Summary of recent work by statistical agencies

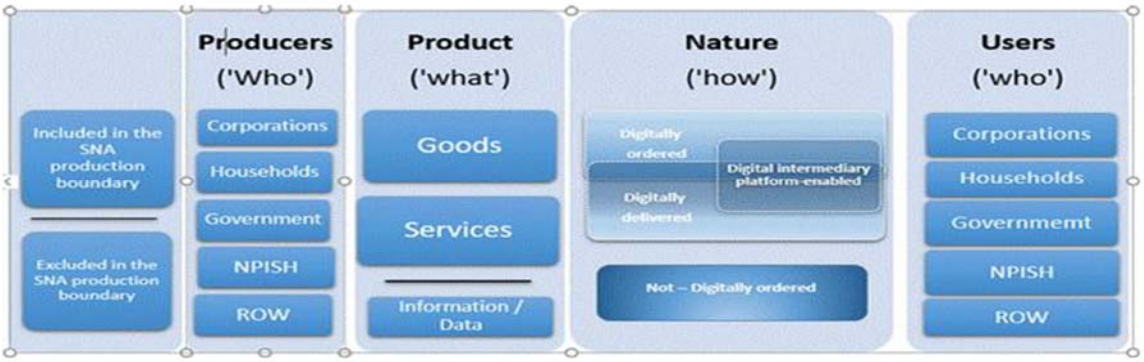
This work is an excellent start and will feed into the proposed digital SUTs. However limitations of the work include

- "Digitalization" is **limited to only (but all of) the total product row**
  - Goods and services delivered by platform or other products only partly affected by digitalization are not included
- The **lack of agreed definitions and terminology** impacts the ability to compare outputs internationally
  - Only high level aggregates have been produced (i.e. total digital economy, type of digital activity)
- Compiled using the **production approach only**
  - Limited information on consumption, import/export, etc.
- They **do not refer to any of the "other" digital issues**.
  - Zero cost consumer products, the use of data in production etc.

Conceptual framework for digital SUTs

Conceptual framework

- In response the OECD has created a framework focused on the transaction, the "how" rather than the use of ICT products
- This is contributing to work of Advisory Expert Group on National Accounts on digitalization



How do the digital SUTs extend on conventional SUTs?

- The digital SUTs delineate digital activity **based on the nature of the transaction** rather than by the product, the producer or the consumer
- Therefore the supply-use tables have been extended by:
  1. Additional rows, under each product, separating the different transactions types
  2. Additional digital product aggregations and lower level products to assist in answering specific user questions
  3. Additional product rows representing products currently outside of the core SNA
  4. Additional columns to represent the new digital industries, units are aggregated based on their shared characteristics
  5. Additional columns allowing for the representation of services that have been digitally delivered

Transactions

- The split in transactions is a significant change to the template (Example below), **allows for all products to be considered as digital**

Accommodation services	
a	Digitally ordered
a_i	Direct from a counterparty
a_ii	Via a resident digital intermediary platform
a_iii	Via a non-resident digital intermediary platform
b	Not Digitally ordered

- Currently this kind of split would be requested only for **aggregates, digital products,** and **products that have been heavily impacted by digitalization** (Accommodation, food service, education)

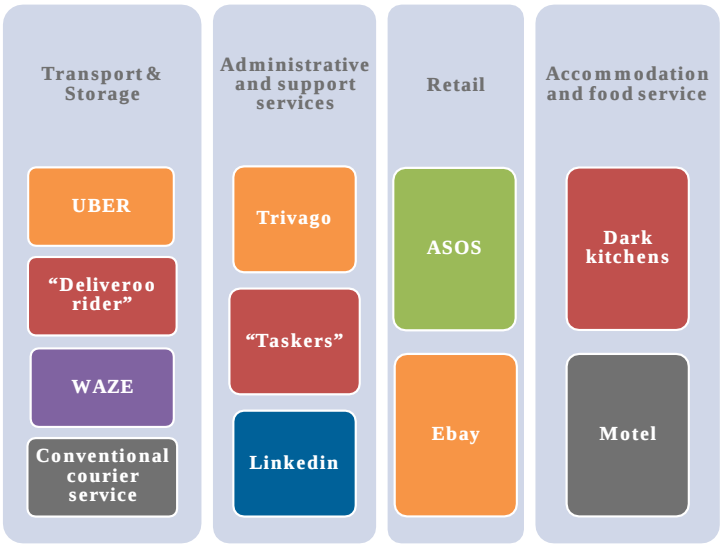
Products

- Digital SUTs have **additional product aggregations** and lower level products to assist in answering specific user questions
  1. ICT goods
  2. Digital services
  3. Cloud computing services
  4. Digital intermediary services
- They also **include product rows to incorporate products currently outside of the core SNA production boundary**
  1. Data (beyond 2008 SNA)
  2. Digital services (beyond 2008 SNA), provided by enterprises
  3. Digital services (beyond 2008 SNA), provided by communities

Industries

- Additional columns to represent the new digital industries
  1. Digitally enabling industries
  2. Digital only firms providing finance & Insurance services
  3. Digital intermediary platforms
  4. Firms dependent on platforms
  5. Data and advertising driven digital businesses
  6. E-Tailers
  7. Other producers operating digitally
- Units reclassified from existing ISIC industry classifications based on shared characteristics

Digital industries



From ISIC to "digital industries"

- **Digital intermediary platforms**
- **Firms dependent on platforms**
- **Data and advertising driven digital businesses**
- **E-Tailers**
- **Other producers operating digitally**
- **Remain in current industry classification**

Digitally delivered

- Defined as *"transactions that are delivered remotely over ICT networks – i.e. over voice or data networks, including the internet, in an electronically downloadable format"* (Handbook on Digital Trade)
- The inclusion of the columns ensures aggregates can be identified that align with the **digital SUTs and digital trade** framework
- Represented in the digital SUTs as additional columns showing additional breakdowns for
  - **Total output**
  - **Total exports**
  - **Total imports**

What the digital SUTs can and cannot do

What can the digital SUTs do?

- Allows for the production of a variety of digital activity indicators, such as:
  - Total E-commerce in the economy
  - Total expenditure on products via third party (platform enabled)
  - Total value add of new "digital industries". E.g. digital intermediary platforms, digital enabling industries, Firms dependent on platforms
  - Total expenditure on ICT goods and digital services by conventional industry
  - Total imports and exports of digital services

What the digital SUTs cannot do

- It does not provide one number as a countries' "digital economy" estimate

Rather it can provide a suite of indicators on digital activity:

  - Total E-commerce in the economy
  - Total expenditure on ICT goods and digital services by conventional industry
  - Total imports and Exports of Digital services

- It does not measure the impact of digitalization on a specific industry (e.g. digitalizations' impact on the production of orange juice)

This is not practically possible and is likely not useful

  - Would be similar to trying to measure the impact of electricity or oil on an industry

- It does not have all the answers regarding the measurement of products outside the current production boundary. (i.e. data)

It does provide a location for them to be included if and when countries begin to estimate the products.

Outputs and next steps

Compilation of the framework

Many countries expressed that currently they would **not have the capability** to produce estimates in the table.

- The digital SUTs are partly designed to **act as road maps** that help to motivate **the development of new data sources**
- Many items included in the tables can be readily **produced from aggregations of current statistics**, and even partially completed tables will significantly help to fill the current information gaps
- Digital SUTs will help to **provide momentum** for all countries in fostering the compilation of **internationally comparable data** on the digital economy
- Some **initial indicators will be targeted first**

High priority indicators

- Specific high priority indicators were discussed at the Informal Advisory Group on Measuring GDP in a Digitalised Economy meeting on 1-2 July 2019
  1. **Output, Gross Value Added** (GVA) and its components, of **digital industries**
  2. Intermediate consumption of **Digital Intermediary Services** (DIS), **Cloud Computing services** (CCS) and total ICT goods and digital services
  3. Expenditures **split by nature of the transaction**
- Provides a wide scope for countries to begin producing estimates despite the various levels of data sources and resources available across countries

High priority indicators (cont.)

- Help in **co-ordinating the initial results** that can be derived from the digital SUTs
- Maximise its use as an **internationally comparable framework**
- Allow for the Digital SUTs to remain as a **roadmap for co-ordinated development** with less advanced countries
- Formal proposal sent to members of advisory group in September to **gage feasibility and timeframe**
- Possibly start **collection of first experimental results**, focusing on high priority indicators, in the course of 2020

Acknowledgements

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