Updating the *SNA* to Reflect the Role of Digitalization

**5TH INTERNATIONAL SEMINAR ON BIG DATA FOR OFFICIAL STATISTICS: MEASURING THE DIGITAL ECONOMY
29-31 MAY 2024**

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Motivation

Digitalization is transforming production processes, products for businesses, and **creating new consumption options for households.** As digitalization becomes more common in economic activity, the **relevance of macroeconomic statistics depends on the ability to adapt the *SNA*** and **develop supplemental frameworks** to meet the **evolving needs of policymakers** and **other users**.

Concerns about digitalization in existing frameworks

- Digitalization: transformation of economic activity and daily life through the application of digital technology.

  ▶ Digitalization is largely hidden in core economic accounts

- Challenges our conceptual frameworks and measurement approaches

  ▶ Production chains between producers and consumers

  ▶ Statistical recording of the production and use of data

  ▶ The "free/zero cost" services provided by private companies, how and what to measure

Research Agenda on Digitalization for the Update of the SNA

1. A Framework for a satellite account on the Digital Economy

2. Price and volume measurement affected by digitalization

3. Recording and valuation of data in National Accounts

4. Treatment of "free" products

5. Crypto currency assets

6. Non-fungible tokens

7. Artificial Intelligence

8. Cloud Computing

9. Digital Intermediary Platforms

Framework for a Satellite Account on the Digital Economy

A handbook on the digital economy

- Developed by the OECD Informal Advisory Group on Measuring GDP in a Digitalized Economy
  - The IAG was created in 2017 to advance the research agenda on digitalization

- The work has evolved from a rough abstract at a IARIW conference and includes a guidance note as part of the SNA research agenda

- The OECD Handbook was published in Fall, 2023
  - It is consistent with the Handbook on Measuring Digital Trade Second Edition produced by the IMF, OECD, UNCTAD, and WTO

- The work remains a priority with users "We encourage improved measurement of the digital economy … to support evidence-based policy Development." G20 Digital Ministerial (August 5, 2021).

- Several countries have produced estimates consistent with the framework

Price and Volume Measurement Affected by Digitalization

Prices and volumes

Volume measures (Real GDP) are typically calculated by **deflating nominal values with a price index**

Digitalization raises questions about the ability of existing methods to **properly measure** both:

1. **Nominal values**—capturing the value of digital goods and services in a timely fashion, and

2. **Price indexes**—properly accounting for
   - Quality change
   - The new ways that goods and services are delivered to final user

Nominal values

Traditional surveys used to collect nominal GDP might **miss or misclassify the output** of digital products.

Countries are encouraged to consider:

- **More-frequent updates** of traditional surveys to rapidly fold in new entities

- **Alternative data sources** to cover areas missed in traditional surveys.
  - ▸ Establishment surveys will miss sharing economy activity. Household surveys may need to be expanded for this purpose.
  - ▸ Third-party market research firms that collect the data for providers of new digital products

- **Other novel ways** to fill in the gaps. For example, in the case of globalization of production:
  - ▸ Where producers are foreign entities, it may be most efficient and effective for the international organization or national statistical agency in the territory in which the platform or provider is located to collect the relevant data from them
  - ▸ Countries could look to domestic estimates with substitute mirror trade data for particular categories produced by the host NSO in that territory

State of play for price indexes

New models of existing digital goods and services
- ► Quality adjustment generally is possible
- ► Hedonics is the gold standard

Entirely new digital goods and services
- ► Quality adjustment is difficult, but
- ► Early introduction of new technology products in price indexes is important, as many technology products display rapidly falling prices in their early years in the market.

Traditional goods and services affected by digitalization
- ► The increasing digital content and attendant quality improvements in traditional goods also requires quality adjustment (e.g., cars)
- ► New ways of providing traditional services requires special handling, though there is no consensus on how this is best done (outlet substitution bias)
  - ◆ UBER, AirBnB
  - ◆ Retail services: online purchases

Price indexes

Across all the areas outlined where fast-moving quality change is a result of the process of digitalization, countries are advised to review:

The **frequency** with which they update their survey collections, to ensure they continue to capture the rapidly changing nature of these product classes and

The **level** at which data is collected and deflation takes place to create volume estimates.

- Often, being able to deflate at more granular levels within the product classification and weighting these at more aggregated levels will be an important component of delivering more robust estimates.

Recording and Valuation of Data

Characteristics of data

- Data is **produced** and included in the SNA production boundary

- Distinguished from underlying non-produced **observable phenomena**

- Focus on **digital** data (non-digital data exist but considered marginal

- **Long-lived data** is an **asset** (therefore also included in the SNA asset boundary)

- Data is subject to **economic ownership**, **valuation** and **depreciation**

- **Short-lived data** are also produced but not an asset (not inventories or valuables)

"Free Products"

Free products (valuation of free assets and free services)

2 work streams:
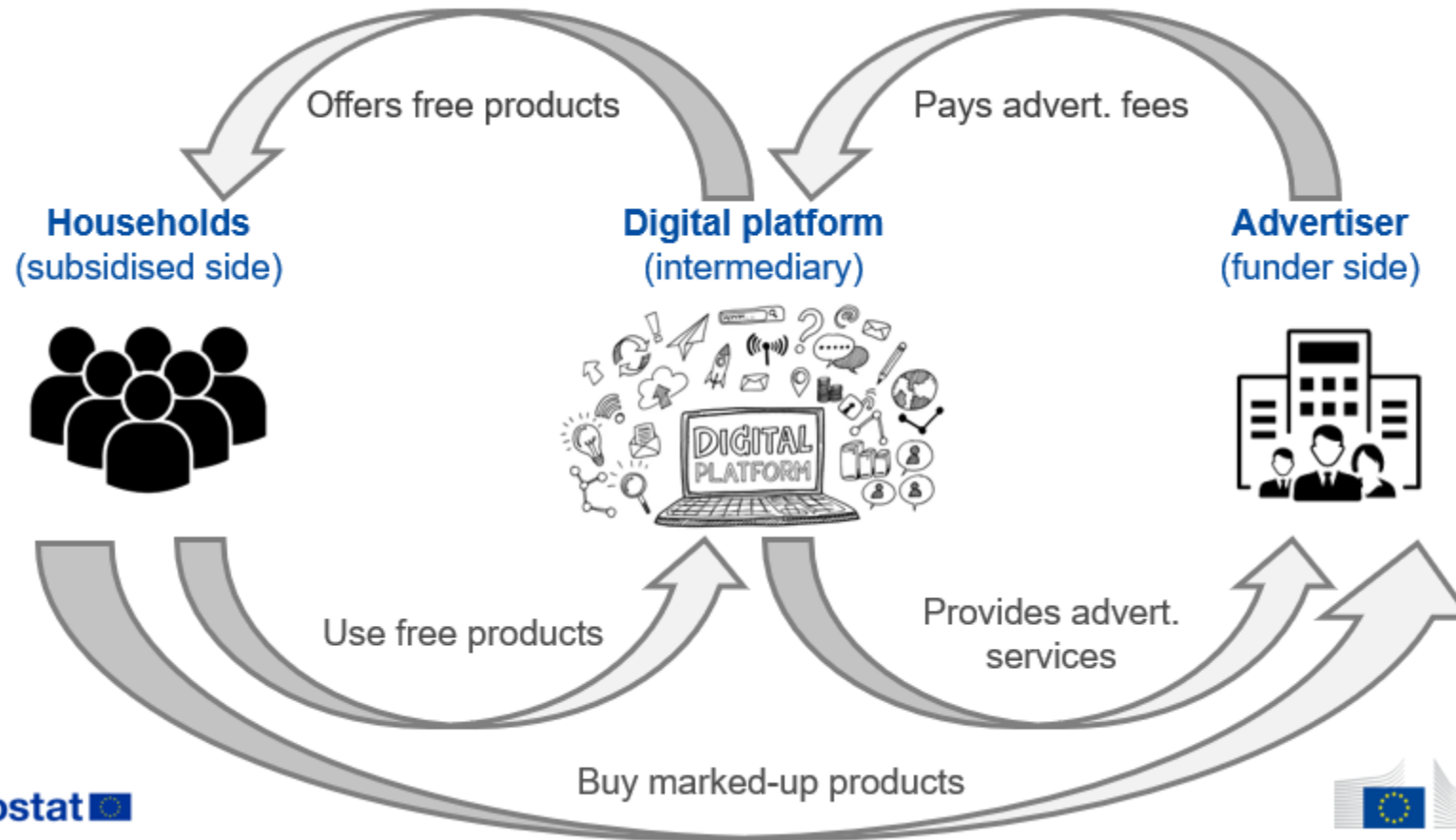   i) Clarifications in core accounts
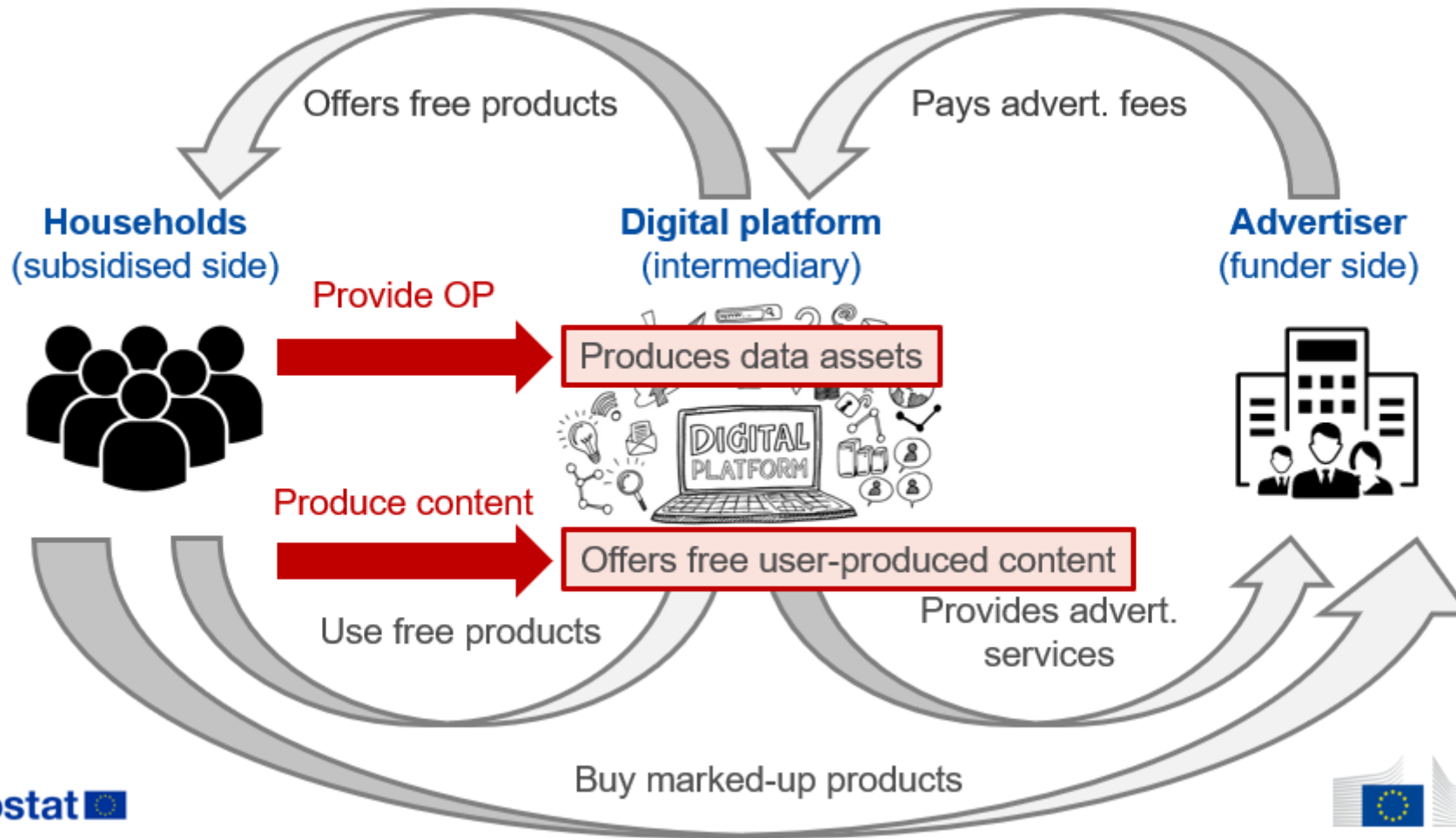   ii) Free products satellite account

No changes to SNA central framework

Link with data: digital platforms and digital apps offering free products are tools to access observable phenomena, which are input for the production of data assets and use data to offer their services

Free products: Guidance on current SNA treatment

Offers free products

Pays advert. fees

Households
(subsidised side)

Digital platform
(intermediary)

Advertiser
(funder side)

Use free products

Provides advert. services

Buy marked-up products

Credit: eurostat

European Commission

Free products: Guidance on SNA Satellite Account

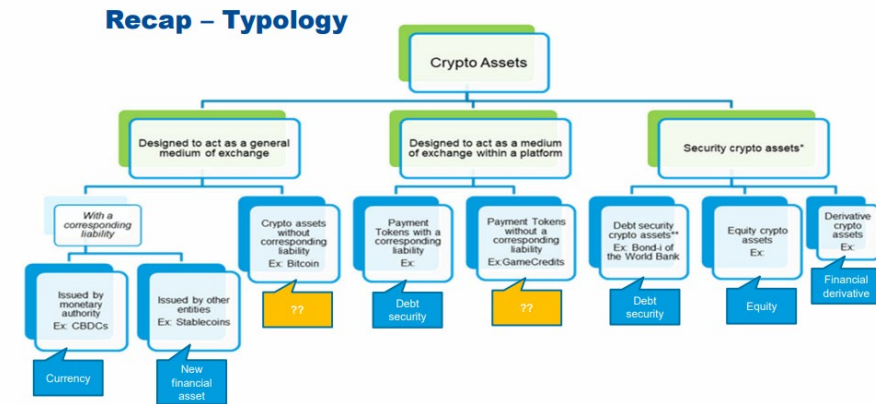Credit: **eurostat** 🇪🇺

European Commission

Crypto Currency Assets

The recording of crypto assets in macroeconomic statistics

Many typologies of Crypto Assets treated as financial assets

Treatment of most of them uncontroversial, except crypto assets without a corresponding liability (CAWL), like Bitcoins

Dilemma: financial or non-financial? Arguments existed in favour and against both options

AEG and BOPCOM decision after broad user and producer consultations: to treat crypto assets designed to act as a medium of exchange w/o a rorrecponding liability as non-financial non-produced assets (to be recorded in the capital account)

This decision may be reconsidered if there are significant (market, regulatory and/or accounting) changes that justify a revision either before or after the release of the manuals in 2025

Given the evolving nature of crypto assets, this issue will remain on the SNA and BOPCOM research agendas

Non-fungible Tokens

Guidance identifies three categories of Non-fungible Tokens

Recommendation for their classification:

1. NFTs that convey **no ownership rights** and only allow for personal use of another asset or product

   ✓ Recorded as **consumption**; can transform into a valuable over time

2. NFTs that convey **limited ownership rights** beyond personal use for another asset or product

   ✓ Recorded as **assets (contracts, licenses, or leases)** if the owner can derive economic benefits from these rights

3. NFTs that convey **full ownership rights** for another asset or product

   ✓ Should **not** be **separately recorded** if the associated assets or products have already been counted

Artificial Intelligence

Artificial intelligence

Recommendations

- Focus on visibility of **AI** in national accounts (already covered but not visible in 2008 SNA)

- The GN **defines AI** as *"a computer program operating a system capable of recognition, reasoning, communication, and prediction emulating human recognition, reasoning, and communication."*

- AI is **produced** and falls within the SNA production and asset boundaries → **GN recommends to record it together with software**

- Strong link between **Data** and **AI**: cost of producing data sets to train AI should be included in the value of own-account AI or Data? → **GN recommends to keep them with Data**

- AI should be appropriately reflected in the activity (ISIC) and product (CPC) **classifications**, currently under review

- Final consideration: AI is part of IPP and should be included in IPP definition

Cloud Computing

Cloud computing

Recommendation: Cloud computing defined as "*Cloud computing services consist of computing, data storage, software, and related IT services accessed remotely over a network, supplied on demand and with measured resource usage*"

- Discusses the economics of cloud computing

- Identifies the measurement issues

- Makes recommendations on
  - ✓ Measuring the **fixed capital assets** of cloud computing providers and customers, including long-term software licenses and financial leases
  - ✓ Measuring **international transactions** in cloud computing services and FDI
  - ✓ Measuring **prices and volumes** of cloud services

Guidance recommends adding further details to existing aggregates rather than creating new high-level classes of cloud computing assets and services

Digital Intermediary Platforms
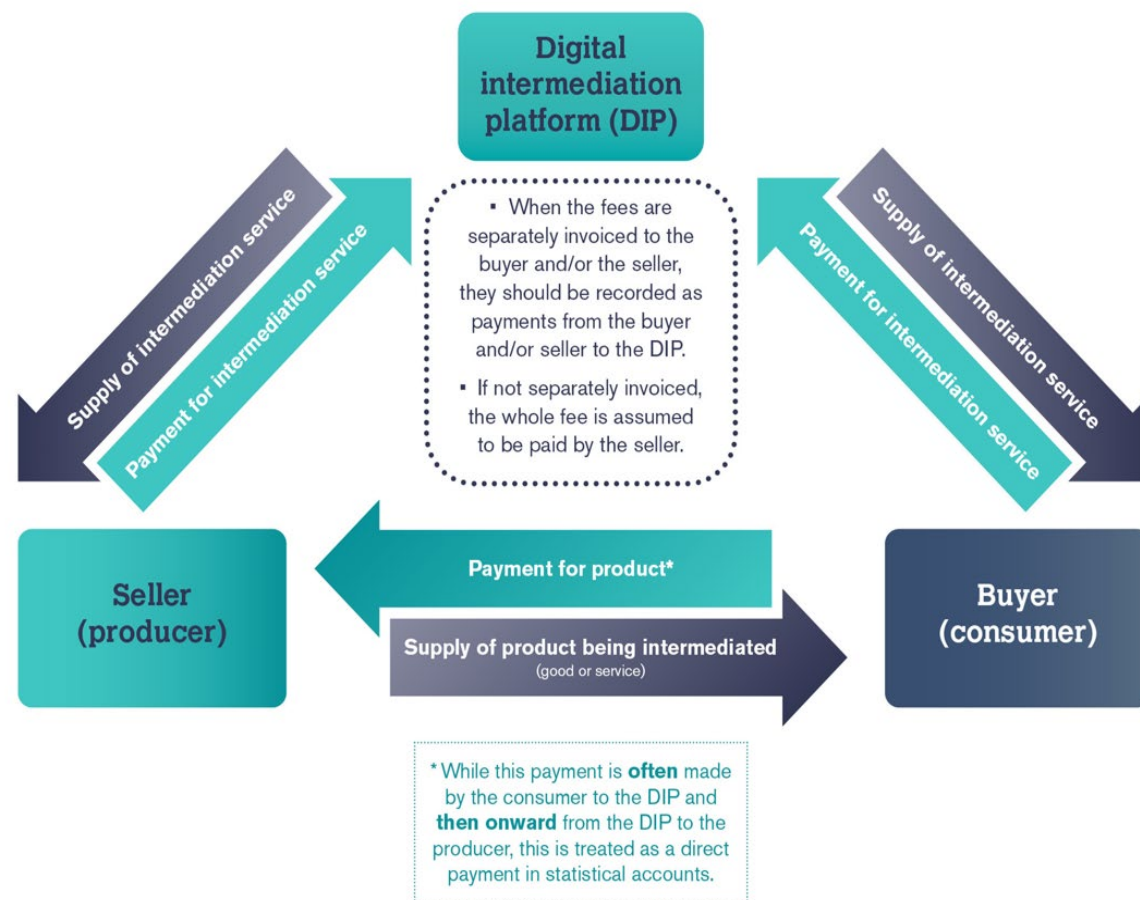
Digital intermediation platforms

From the perspective of the SNA, a digital intermediary platform meets the following criteria:

- **Charges a fee** for digitally facilitating an economic transaction between two independent parties
- **Does not take economic ownership** of the goods and services ultimately sold to the consumer

Included: Airbnb, eBay, Alibaba, Booking, Uber.
Excluded: Google, Facebook, YouTube, etc.

Recommended recording of DIPs' transactions on the producer focused basis:

Digital intermediation platform (DIP)

- When the fees are separately invoiced to the buyer and/or the seller, they should be recorded as payments from the buyer and/or seller to the DIP.
- If not separately invoiced, the whole fee is assumed to be paid by the seller.

Supply of intermediation service
Payment for intermediation service

Supply of intermediation service
Payment for intermediation service

Seller (producer)

Payment for product*

Supply of product being intermediated (good or service)

Buyer (consumer)

* While this payment is **often** made by the consumer to the DIP and **then onward** from the DIP to the producer, this is treated as a direct payment in statistical accounts.

Thank you

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Any omissions are accidental