Joint Thirty-Ninth Meeting of the
IMF Committee on Balance of Payments Statistics
and Twenty-First Meeting of the Advisory Expert
Group on National Accounts

Inter-secretariat
Working Group on
National Accounts

Washington, D.C.
October 18–20, 2022

BOPCOM—22/17b
SNA/M4.22/27b
For discussion

BPM7 Chapter 16/*2025 SNA* Chapter 22. Digitalization: Annotated Outline

Prepared by the Statistics Department

INTERNATIONAL MONETARY FUND

BPM7 Chapter 16/*2025 SNA* Chapter 22. Digitalization: Annotated Outline[1]

(New SNA chapter)

This annotated outline has been prepared jointly to cover the full range of topics to be included in chapters on digitalization. In the drafting stage, only those issues that are relevant from the external sector statistics perspective will be included in the BPM; likewise, only those issues that are relevant to national accounts will be included in the SNA.

I. Introduction

- This new thematic chapter will elaborate on measurement issues arising from digitalization that are touched upon throughout the manuals and will provide a consolidated view of these issues.
- This new chapter will provide definitions, explanations, and measurement guidance for the products and business models that have emerged in the digital economy.
- The introductory section will define digitalization and mention the aspects of the digital economy that will be covered in the chapter. It will also provide a brief overview of the measurement issues. It will mainly draw on sections 1 and 2 of Guidance Note (GN) DZ.1 and sections 1–4 of GN DZ.5.
- The chapter is organized in the following sections: *Products that Enable Digitalization* with subsections on information and communications technology (ICT) goods and services, data, software including artificial intelligence (AI), and cloud computing (Section II); *Digital Platforms*, with subsections on definitions and classifications, nonfinancial and financial digital intermediation platforms, and free platforms funded by advertising and data collection (Section III); *Impact of Digitalization on Financial Services and Payments* (Section IV); *Measuring Prices and Volumes of Products affected by Digitalization* (Section V); and *Analytical Tools for Measuring the Impact of Digitalization*, with subsections on digital supply and use tables and an extended account for free digital platforms (Section VI).

II. The Products that Enable Digitalization

ICT Goods and ICT Services

- This section will open with a brief discussion of ICT goods and ICT services, identifying them as the products that enabled the digital transformation and noting the foundational roles of advances in semiconductors and telecommunications. The discussion will also note the roles of data assets, AI software, and cloud computing in deepening the digital transformation and mention that they are discussed in the section on measurement of prices and volumes. This section will draw on GN DZ.5 and on Mitchell (2021), "Digital Supply-Use Tables: A Step Toward Making Digital Transformation More Visible in Economic Statistics".

[1] Prepared by Marshall Reinsdorf (SNA lead) and Venkat Josyula (BPM lead) and cleared by SNA/BPM Project Managers

Data Assets

- This subsection will note that data assets are central to many firms' value and operations in the digital economy, define data as an asset produced by accessing and recording observable phenomena (OP), and provide guidance on measuring gross and net investment in data assets and transactions in data copies.
- The recommendations on data as an asset will expand the software and databases category of intellectual property products of the *2008 SNA* (paragraph 10.109–10.114) and the SNA production boundary. This discussion will draw on GNs DZ.6 and DZ.4.

Issues in the Measurement of Software

- This subsection will note that the digital transformation has led to issues in the measurement of software investment of measuring and increasing the visibility of AI software and of open-source software, and of accounting for software hosted or run in the cloud.
- The discussion of AI software and AI systems will define AI and characterize its links to data—data assets are used to train AI software via machine learning (ML) and data inputs are used for AI decision making. This discussion will then provide guidance on measuring AI software assets and data assets used to create software. It will also recommend increasing the visibility of AI by distinguishing AI software as a special type of software. This change will be reflected in an expanded definition of intellectual property products replacing the current definition in *2008 SNA* paragraph 10.98. The AI discussion will draw on GN DZ.8.
- This subsection will next discuss investment in long-term licenses for software hosted in the cloud as a measurement issue arising from cloud computing. Finally, it will refer to the discussion of open-source software in the free products section below. It will draw on the GNs DZ.3, DZ.6, DZ.7, and DZ.8 and the Eurostat-OECD *Report on Intellectual Property Products.*

Cloud Computing

- This subsection will note that cloud computing services are a critical input for producing many of the services of the digital economy. It will then define cloud computing and hosting services and discuss the compilation challenges and data needs arising from the replacement of ownership of on-premises IT capital stocks by remotely accessed computing services. Further, guidance on determining economic ownership of IT assets, measuring own-account investment in equipment, measuring cross-border transactions in cloud computing services, and measuring foreign direct investment (FDI) associated with cloud computing, including foreign-hosted IT equipment recorded on an ownership basis, will be provided.
- This subsection will also mention that developing the estimates of intermediate consumption of cloud computing services recommended in the section on the digital SUTs (Section VI) may improve measurement of cloud computing and provide important information for data users. It will also reference the discussion of cloud computing in the section on measuring prices and volumes (Section V).
- This subsection will draw on GN DZ.8 and on the cloud computing discussions in GN DZ.1. In other chapters of the SNA, the discussion of ICT equipment (currently in paragraph 10.85) will be

rewritten to clarify that accessing the cloud is not sufficient for equipment to be includable in ICT equipment, and the discussion of capital services (*2008 SNA* Chapter 20 or *2025 SNA* Chapter 17) will mention the substitution of purchased capital services for own-account capital services caused by cloud computing.

III. Digital Platforms

Definitions and Classifications

- This subsection will define digital platforms, distinguishing them from non-platforms such as e-tailers. It will also define digital intermediation and identify the three types of digital platforms: (1) non-financial digital intermediation platforms (DIPs), which intermediate transactions in goods and nonfinancial services; (2) free platforms funded by advertising and collection of users' OP; and (3) financial DIPs, which intermediate funding transactions or payment transactions. Next, it will indicate that financial DIPs will be discussed in a separate section on fintech. This discussion will be based on GNs DZ.9, DZ.1, and F.7.

Nonfinancial Digital Intermediation Platforms (DIPs)

- This subsection will discuss nonfinancial DIPs, noting that they receive fee income for facilitating transactions but do not take ownership of the good or service being transacted. It will then mention the compilation challenges in measuring the services of these DIPs and the activity that they intermediate, including prevalence of cross-border transactions and of informal suppliers. It will also present the net approach to recording these transactions and explain how it affects measurement of the cross-border transactions of DIPs (perhaps using different terminology if there is a decision to adopt an alternative term to "net"). These issues are discussed in the draft *BPM7* Chapter 11 *Services Account* and mentioned that additional details are covered in the chapter on *Digitalization*. This discussion will draw on DZ.9.

- In addition to new material in this chapter, in Chapter 7 of the new SNA, the definition of margin services (paragraph 6.21) will be updated to clarify that margin services exclude digital intermediation services that facilitate changes in ownership of goods.

Financial DIPs

- This subsection will discuss digital fund-raising platforms as suppliers of financial digital intermediation services. These services comprise peer-to-peer lending, equity-based crowdfunding, and philanthropic crowdfunding. This subsection will also note that digital fund-raising platforms generally receive explicit fees for their matching and transaction facilitation services, which means that they should be classified as financial auxiliaries. In other words, they are not financial intermediaries, defined as financial service providers that borrower from the suppliers of funds and lend to the users of funds.

Free Digital Platforms and Free Digital Products

- This subsection will explain how free products that are part of a bundle of outputs supplied by platform and non-platform market producers are included in current-price GDP. It will then explain the measurement framework of free platforms funded by advertising and creation of data assets

from users' OP. It will also provide guidelines on open-source software and user-generated content. This subsection will be based on GN DZ.3.

- The subsection will next briefly discuss free digital products in measures of price and volume change and reference the longer discussion of free digital products in Section V on price and volume measurement. This part of the section will draw on GN DZ.1.

- This subsection will recommend a supplementary account with an alternative treatment of free digital platforms funded by advertising and collection of users' OP. The alternative treatment will reroute a portion of households' spending on advertised products to be direct purchases of the platforms' free services. It will also recommend expanding the measure of platforms' investment in data assets to include the cost of procuring households' OP by producing free services that attract users to platform and the value of the user-generated content that households produce with intermediate inputs of the platform's "free" services. This part of the section will be based on GN DZ.4.

- Finally, the subsection will note that the supplementary information provided on free products could include using adjusted prices to value bundled free and marked-up items where the price of the marked-up item funds the free item.

IV. Impact of Digitalization on Financial Services and Payments

Fintech

- The introduction to this section will note that the impact of digitalization on financial services, often referred to as fintech, has resulted in the appearance of new financial services and payment mechanisms, and in enhancements to existing financial services. It will also mention the impacts of fintech on insurance operations and contracts. Finally, it will note that new and enhanced services made possible by fintech represent additions to existing categories of products and activities. *BPM7* chapter on Services Account discusses these issues noting that further details are provide in the chapter on Digitalization. This subsection and the next one will draw on GN F.7.

Digital Assets

- Digital assets are broadly classified into two categories: (i) Digital assets designed to act as a general medium of exchange (with and without corresponding liability); and (ii) Other digital assets such as securities. This subsection will include a decision tree to distinguish different digital assets (designed to act as a general medium of exchange and others) based on Annex II.1, GN F.18. As presented in the decision tree, crypto assets are a sub-category of digital assets.

- This subsection will also provide the definition of various types of digital assets, including central bank digital currencies (CBDCs) and crypto assets, and explain the roles of distributed ledger technology (DLT) and blockchains in enabling decentralized payment clearing. It will explain that crypto assets are broken down into fungible and nonfungible crypto assets. Further, a typology of

fungible crypto assets based on Annex II.2, GN F.18, will be included to explain the classification of fungible crypto assets.

- It will be noted that all fungible crypto assets meet the asset boundary. Regarding the classification of fungible crypto assets, those with a corresponding liability should be recorded as financial assets.
- The classification of fungible crypto assets designed to act as a general medium of exchange without a corresponding liability (CAWLM) and fungible crypto assets designed to act as a medium of exchange within a platform or network without corresponding liability (CAWLP) is not yet decided and this AO will be updated based on the decision of the joint AEG/BOPCOM meeting in October 2022.
- A discussion of the recommended treatment of Non-fungible crypto assets based on GN DZ.10 will be added when that GN becomes available.

V. Measuring Prices and Volumes of Products affected by Digitalization

- This section will note that many of the measurement challenges from digitalization involve volumes rather than current-price output and provide an overview of the issues and methods for measuring price and volume change in the digital economy.
- The products and activities considered will include ICT goods, software and data, cloud computing and other ICT services, DIPs, e-commerce, and free platforms funded by advertising and data collection.
- The measurement issues include the frequent appearance of new or improved products and product models, outlet substitution, customization/variety, bundling, and behavior of e-commerce prices and varieties
- The methods will include quality adjustment techniques (hedonics, options pricing, producer costs), resampling (as defined in the Eurostat *Handbook on Price and Volume Measures in National Accounts*), and unit value indexes for homogeneous items. Research techniques that rely on uncertain assumptions will be mentioned but not recommended for national accounts compilation purposes.
- This section will also refer to the overview of price and volume measurement in Chapter 18 of the *2025 SNA*. This section will draw on GN DZ.1, the Eurostat *Handbook on Price and Volume Measures in National Accounts*, and the *Consumer Price Index Manual: Concepts and Methods* (2020). Research papers cited in GN DZ.1 may also be consulted.

VI. Analytical Tools to Show the Impact of Digitalization

Thematic Account on the Digital Economy and Extended Account on Free Digital Products

- The first part of this subsection will indicate that the extended account discussed in the section on free digital products and a more comprehensive thematic account on the digital economy will help show the impact of digitalization. The thematic account on the digital economy would show the alternative aggregations and additional detail developed in digital supply-and-use tables (SUTs)

together with the alternative measures of free digital products based on expanded boundaries of production and consumption developed in the extended account on free digital products.

Digital Supply-and-Use Tables

- This subsection will present guidelines for compiling digital SUTs as a tool for showing the extent of digitalization in the economy by adding rows to the SUTs that break out transactions that are digitally ordered or digitally delivered, while also providing a breakdown of the digital products.
- The digital SUTs also contain added columns on the output, value added, and intermediate consumption of (1) ICT industries; (2) free digital platforms funded by advertising and data collection; (3) non-financial DIPs; (4) firms dependent on DIPs; (5) e-tailers; (6) digital only firms providing financial and insurance services; and (7) other producers operating only digitally. The units to include in these groupings will be briefly discussed.
- The section will also identify priority indicators within the digital SUTs. These will include value added of digital industries, intermediate consumption of digital intermediation services and cloud computing services, and digitally ordered transactions.
- The section will draw on the GN DZ.5 and on "Digital Supply-Use Tables: A Step Toward Making Digital Transformation More Visible in Economic Statistics", *Going Digital Toolkit Note*, No. 8.

Schematic Overview

I	Introduction Definition of digitalization; scope of the digital economy as covered in the chapter Organization of the chapter
II	The Products that Enable Digitalization ICT Goods and ICT Services Data Assets Issues in the Measurement of Software Cloud computing
III	Digital Platforms Definitions and classifications Nonfinancial Digital Intermediation Platforms (DIPs) Financial Digital Intermediation Platforms Free Platforms and Free Digital Products
III	Impact of Digitalization on Financial Services and Payments Fintech Digital Assets Digital Assets Decision Tree Fungible Crypto Assets Nonfungible Crypto Assets
IV	Measuring Prices and Volumes of Products Affected by Digitalization Distinction between volume measurement and current-price measurement Digital Products that present Price and Volume Measurement Challenges Methods for Handling the Price Measurement Challenges
V	Analytical Tools to Show the Impact of Digitalization Thematic Account on the Digital Economy and Extended Account on Free Digital Products Digital Supply and Use Tables

Questions for the Committee

- *Does the Committee have any suggestions on the draft outline of the chapter?*
- *Does the Committee agree with the proposed structure and coverage of topics in the chapter presented in this outline?*
- *Does the Committee have views on how much detail on fintech and digital assets is appropriate to include in the SNA rather than just in the BPM?*

References

- Guidance Notes DZ.1, DZ.2, DZ.3, DZ.4, DZ.5, DZ.6, DZ.7, DZ.8, DZ.9, F.7, and F.18
- Eurostat-OECD *Report on Intellectual Property Products.*
- Eurostat *Handbook on Price and Volume Measures in National Accounts*
- IMF *Consumer Price Index Manual: Concepts and Methods* (2020)
- Mitchell, J. (2021) Digital Supply-Use Tables: A Step Toward Making Digital Transformation More Visible in Economic Statistics, *OECD Going Digital Toolkit Note*, No. 8.
- Shirono et al., 2021, Is Mobile Money Part of Money? Understanding the Trends and Measurement, IMF Working Paper.
- *MFSMCG* Chapter 3
- *2008 SNA* Chapters 3, 4, 6, 10, and 15

Key Stakeholders Consulted: SNA/BPM editors, IMF STA BP and FI