

## TECHNICAL NOTES

### Philippine Digital Economy

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#### I. Introduction

The use of digital media and transactions has been part of many activities globally. With the technological advancement in various industries, the digital economy has evolved and the use of digital technologies became more accessible. Although these advances in technology resulted in a more complex measurement of the digital economy, there are various country efforts done to measure the contribution of digital activities to the Gross Domestic Product (GDP). However, it was noted that measuring the digital activities has been challenging due to issues on definition, classification, and measurement.

In 2019, Philippine Statistics Authority (PSA) thru the Macroeconomic Accounts Service (MAS) collaborated with the World Bank (WB) in estimating the size of digital economy and its contribution to the country's economic growth. While there is still no internationally agreed definition and classification for the digital economy, the PSA builds on earlier initiatives of other institutions such as Organisation for Economic Cooperation and Development (OECD), US Bureau of Economic Analysis (BEA), and Australian Bureau of Statistics (ABS), and the experiences and insights gained through these initiatives.

With the results of the PSA-WB Project, PSA is committed to continue improving the methodology and exploring other indicators to capture the contribution of digital economy. In 2020, the World Bank released the Philippines Digital Economy Report with initial estimates providing the share of digital economy to GDP.

The preliminary 2018 to 2021 estimates on digital economy provides information on the Gross Value Added (GVA) of e-commerce, digital media/content, and digital-enabling infrastructure which includes Computer, electronic and optical products, Wholesale trade, Telecommunication services, Professional and business services, and Repair of computers and communication equipment.

## II. Data and Data Sources

The data used in the compilation of the preliminary estimates on digital economy are obtained from several sources. Below are the major data sources for the estimation of digital economy.

Data	Description / Use	Source Agency
Supply and Use Table (SUT)	<p>The 2018 SUT provides information on the structure of the Philippine economy.</p> <p>Primary source for the technical coefficients or ratios used in estimating the Gross Output and Gross Value Added of digital-enabling infrastructure, digital media/ content, and e-commerce.</p>	PSA
National Accounts of the Philippines (NAP)	<p>Primary source of information used in deriving the overall production and consumption of the economy</p> <p>The Gross Output of Information and publishing, Manufacturing of computer, electronic and optical products, Wholesale trade, Communications, Professional and business services, and Other services of NAP are used in the estimation.</p>	PSA
Annual Survey of Philippine Business and Industry (ASPBI) and Census of Philippine Business and Industry (CPBI)	Provides information on the Gross Output of selected industries, sales from e-commerce transactions, and employment in digital economy industries.	PSA

Data	Description / Use	Source Agency
Survey on Information and Communications Technology (SICT)	Provides information on the ratio of establishment which received orders for goods and services via Internet, as well as percentage of employees using computer with Internet connection or access.	PSA
Labor Force Survey (LFS)	Provides information on the total number of employed persons by industry.	PSA

### III. Methodology

#### III.A. Estimation Methodology

The estimation of the contribution of digital economy in the Philippines is measured using the Production Approach or Value-Added Approach. This method consists of summing the GVA of all industries that are identified as part of the digital economy.

The list of core ICT industries of the Philippines serves as the basis in defining the statistical coverage of the digital economy. These industries represent the digital-enabling infrastructure and digital content/media components of the digital economy. In addition, for a more comprehensive coverage, digital transactions or electronic commerce (e-commerce) of the country is also included. Estimates for this component is computed using percentage of industries with e-commerce transactions or those non-core ICT industries which received orders via Internet.

For each industry classified as part of the digital economy, the Gross Output (GO) is estimated. The GVA ratio from NAP was applied to GO of each industry to derive the GVA. The sum of GVAs of industries identified as part of digital economy is the total GVA for digital economy.

## Digital-enabling infrastructure and Digital media/content

The estimation of GO of digital-enabling infrastructure and digital media/content used the structure of 2018 CPBI.

$$GO_{DE1_{2018}} = \sum_{d=1}^m GO_{DEd_{2018}}$$

$$GO_{DE2_{2018}} = \sum_{d=1}^p GO_{DEd_{2018}}$$

$$GO_{DEd_{2018}} = \frac{GO_c}{\sum_{i=1}^n GO_{c_i}} * GO_{s_{2018}}$$

where:

*DE1* = digital-enabling infrastructure

*DE2* = digital media/content

$GO_{DE2018}$  = estimated GO for digital-enabling infrastructure and digital media/content in 2018

$GO_{DEd2018}$  = estimated GO for 2-digit industry under digital-enabling infrastructure and digital media/content

*d* = 2-digit industry in the 2018 CPBI

*m* = number of 2-digit industry in DE1

*p* = number of 2-digit industry in DE2

*i* = industries in the following 2-digit industries from 2018 CPBI:

1. Manufacture of computer, electronic and optical products
2. Wholesale trade, except of motor vehicles and motorcycles
3. Telecommunications Services and Computer Programming, Consultancy and Related Activities
4. Office administrative, office support and other business support activities
5. Repair of computer and communication equipment
6. Content and Media Industries, Motion picture, video and television programme production, sound recording and music publishing activities, Programming and broadcasting activities, and Data processing, hosting and related activities

$c$  = 5-digit industry under digital-enabling infrastructure and digital media/content from 2018 CPBI

$GO_{s2018}$  = GO of major industry available in the 80-industry classification in the 2018 SUT that corresponds to each 2-digit industry  $i$ , namely:

1. Manufacture of computer, electronic and optical products
2. Wholesale trade, except of motor vehicles and motorcycles
3. Communications
4. Professional, Scientific and Technical Activities; Administrative and Support Service Activities
5. Other service activities
6. Information and Publishing

$n$  = number of 5-digit industry within  $i$  number of  $c$

### **E-commerce transactions**

The estimation of GO of e-commerce transactions utilized the number of non-core ICT establishments that received orders for goods and services via Internet from SICT, and the sales from e-commerce transactions from ASPBI/CPBI.

$$GO_{DEi2018} = N_{i2018} * Sales_{i2018}$$

$$GO_{DE2018} = \sum_{i=1}^q GO_{DEi2018}$$

where:

$GO_{DE2018}$  = estimated GO for e-commerce in 2018

$GO_{DEi2018}$  = estimates GO for industry  $i$  under e-commerce

$N_{i2018}$  = estimated number of establishments which received orders for goods and services via Internet in 2018

$i$  = industry

$q$  = number of 2-digit industry in e-commerce

$Sales_{i2018}$  = estimated e-commerce sales per establishment in 2018

## Employment in digital economy

For infrastructure and digital media components, the structure of 2018 CPBI was utilized to derive the ratio of employed persons in digital economy by industry. The ratio was applied to LFS to derive the total number of persons employed by component.

For e-commerce, the ratio of employees with computer and internet access from SICT served as the structure of employment. This ratio was applied to the estimated total number of employed persons in non-core ICT industries.

### III.2. Digital Economy Tables

The following are the available tables:

Table 1 Gross Value Added of digital economy	Presents the value of production of the following sub-components of digital economy: a. E-commerce b. Digital media/content c. Computer, electronic and optical products d. Wholesale trade, except of motor vehicles and motorcycles e. Telecommunication services f. Professional and Business services g. Repair of computers and communication equipment
Table 2 Growth rates of digital economy	Presents the growth rate of the seven (7) sub-components of digital economy.
Table 3 Percent Share to digital economy by sub-component	Presents the share of each of the seven (7) sub-components to the total digital economy.

Table 4 Digital Economy and GDP	Presents the levels of digital economy and GDP at current prices, as well as the share of digital economy to GDP.
Table 5 Employment in digital economy	Presents the number of employed persons by sub-component of digital economy
Table 6 Employment growth rates	Presents the growth rates of employment by sub-component of digital economy.
Table 7 Employment percent share	Presents the percent share of employed persons by sub-component of digital economy.

#### IV. Concepts and Definition of Terms

The digital economy refers to a broad range of activities, which include the use of knowledge and information as factors in production, information networks as a platform for action and how the information and communication technology (ICT) sector spurs economic growth.

The Philippine approach borrows from the US BEA experience and similar efforts. BEA defines the digital economy primarily in terms of the Internet and related information and communications technologies (ICT). Conceptually, BEA includes in its definition of the digital economy the following:

- A. Digital-enabling infrastructure needed for a computer network to exist and operate;
- B. Digital transactions that take place using that system (“e-commerce”); and
- C. The content that digital economy users create and access (“digital media”).

The *digital-enabling infrastructure* is comprised of the basic physical materials and organizational arrangements that support the existence and use of computer networks and the digital economy. This includes computer hardware and software, telecommunications equipment and services, and internet of things (Barefoot et al., 2018).

*Digital Transactions or electronic commerce (e-commerce)* includes all transactions (i.e., the purchase and sale of goods and services) that

happen over computer networks. They may be digitally-ordered, digitally-delivered, or platform-enabled transactions. E-commerce includes business-to-business, business-to-consumer, and peer-to-peer transactions (Barefoot et al., 2018).

*Digital media* refers to the content that people create, access, store, or view on digital devices such as direct sale digital media, free digital media, and big data (Barefoot et al., 2018).

#### Other relevant concepts

*Digitization* refers to the encoding of information or procedures into binary bits that can be read and manipulated by computers and that can take many forms such as the translation of analogue measurements; encoding business and industrial processes; voice over Internet protocol (VOIP); social networks (as alternatives to face-to-face interactions), etc. (Ahmad and Ribarsky, 2018).

*Digitalization (Digital transformation)* refers to the changes produced by different forms of digitization, the resulting applications, systems, platforms, and the effects on economic and social activity constitute (Ahmad and Ribarsky, 2018).

## V. Dissemination of Results and Revision

The schedule of release of the revised digital economy estimates is four (4) months after the reference year. Press release, statistical tables, social cards, and infographics on digital economy are posted on the PSA website.

## VI. Citation

Barefoot, K., Curtis, D., Jolliff, W., Nicholson, J.R., Omohundro, R. (2018). *Defining and Measuring the Digital Economy, Working Paper*. <https://www.bea.gov/sites/default/files/papers/defining-and-measuring-the-digital-economy.pdf>

Ahmad, N. & Ribarsky, J. (2018). *Towards a Framework for Measuring the Digital Economy*. Prepared for the 16th Conference of the International Association for Official Statistics (IAOS), OECD Headquarters, Paris, France.

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