THE STATISTICAL CHALLENGES IN MEASURING THE DIGITAL ECONOMY

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Abstract. Digitalization is changing the economic activity, creating new products and services, and the growth of online transactions. It is creating new business models and processes, reshaping the traditional payment systems, and how goods and services are delivered and consumed. Digital technology has a significant impact on the economy in the last decade, transforming production processes and activities while generating benefits to society as a whole. It has empowered consumers to access a large variety of goods and services online. It has changed how the business operates and how consumers engage in a transaction with the business. Digital activities have become a significant contributor to economies around the world. Despite the rapid pace of change, there is little statistical information available that helps us understand the economic and social impacts of the digitalized world. This paper provides an overview of statistical challenges in measuring the digital economy.

I. Introduction

There is no official or agreed definition of the digital economy. The term digital economy incorporates all economic activities enhanced by the use of digital inputs, including digital infrastructure, digital technologies, digital services, and data. It refers to all producers and consumers that are utilizing these digital inputs in their economic activities [1]. The International Monetary Fund (IMF) defines the digital economy as the use of digital transformation. There are many interpretations of the same term. The digital revolution has transformed our lives with unprecedented speed, providing immense opportunities as well as formidable challenges. With the rapid growth of the internet starting in the mid-1990s, digital activities started expanding and changed how the business operates, communicate, and perform everyday tasks. The changes associated with digitization result in the emergence of new occupations, and the decline or replacement of some jobs. The growth of electronic commerce (e-commerce) has been made possible by the expansion of access to computers, mobiles, and the internet in the home, workplace, and university. It is a mainstream channel for consumption, and products are moving from tangible mediums (books, CDs, games, teaching) to digital forms. Today we can buy books, clothes, jewellery, furniture, grocery, gadgets, and other products online. In the banking sector, the digital revolution has led to the introduction of new services such as internet banking, and mobile banking. It allows customers to access their accounts twenty-four hours a day and seven days a week. The impacts of digitalization can be seen in financial services, transportation, courier, retail, hotels, among many others. Customers now use

computers, mobiles, laptops, and tablets to identify hotels and restaurants, sellers, buyers, evaluate products and services, and compare prices. Businesses use networks to reach new customers, streamline the procurement process, and manage internal operations. Technological developments have made old skills obsolete and led to the demand for completely new skill sets. Information and Communications Technology (ICT) are at the forefront of this transition today and are generating policy interest in new skills needs and methods to develop these skills. The digital economy includes individuals, societies, and communities. Digitization is creating intelligent digital networks that will change the way business is managed, optimized, and deployed.

II. Identifying Digital Economy Goods and Service

The digital economy includes those goods and services that are delivered digitally. It consists of a wide range of economic activities and a large amount of data they generate. The digital economy is growing, especially in developing countries. The core of the digital economy comprises the internet, telecom networks, computers, and telecommunication devices. With digital technologies promoting ever more transactions, the digital economy is becoming inseparable from the functioning of the economy as a whole. Digital and information technology (IT) sectors produce products and services that rely on digital technologies, including digital platforms, payment services, and mobile applications. Examples include banking, finance, insurance, media, tourism, and transportation. Many sectors of the economy are digitalizing in this way. Digitally literate workers, consumers, and buyers are crucial for the growth of the digital economy. These activities are using in various ways as a basis for measuring the impact of the digital economy.

III. Challenges in Measuring the Digital Economy

Measuring the digital economy and related value creation is fraught with difficulties. Reliable statistics on its key components and dimensions, especially in developingcountries, are missing. A first challenge to measuring the digital economy is the lack of a universally accepted definition that makes the international comparison of the digital economy difficult. United Nations Conference on Trade and Development (UNCTAD) distinguishes the digital economy into core, narrow, and broad scopes. The core dimensions relate to ICT infrastructure and the ICT-producing sector. The broader scope refers to the use of digital technologies and the internet for performing different economic activities. Ideally, the measurement of value in the digital economy should cover all three levels: the digital sector, the digital economy, and the digitalized economy [2]. With the rapid growth in digitally-enabled economic activity across much of the globe, understanding the role of Information and Communications Technology (ICT) and the internet in the economy is very important. Digitalization has created significant challenges for measurement. The objective of measuring the digital economy is to advance the measurement agenda to better monitor the role of ICT and the internet in the economy and

their contributions to generating jobs and growth. That is a challenge as the international community develops international policy guidelines on the protection of personal and consumer data. Measuring the digital economy beyond digital and digitally-enabled sectors is difficult. There is various study about measuring the digital economy, and many researchers have presented different indicators that can use to measure the digital economy. The Toolkit for Measuring the Digital Economy, G20 Argentina, 2018, provides possible measurement approaches that support evidence-based policymaking, diagnoses the challenges and opportunities of the digital economy. More than 30 indicators and methodologies to monitor and assess the size of the digital economy are organized into four themes according to their purpose of measurement. 1) infrastructure; 2) empowering society; 3) innovation and technology adoption; and 4) jobs and growth [3] measuring the digital economy and understanding the dimensions of its impact means improving the measurement of the traditional economy.

IV. Statistical Challenges in Measuring the Digital Economy

How digital products are consumed and distributed is creating significant challenges for statistical agencies around the world. There are many new sources of information, but mostly unstructured for statistical purposes. This imposes statistical agencies a new role in data management, which involves data storage, handling, and dissemination. The use of a diverse source of data is challenging. The lack of structured statistical data constitutes a gap to measure the digital economy. To make statistical systems flexible and responsive to the new digital era countries need to experiment with data gathering, define policy needs, and set priorities for internationally comparable measurement. Countries need to work with international organizations to make use of the potential of big data for developing indicators to measure the digital economy. Existing data collections will need to review to maximize data-linking opportunities for research and analysis. Statistical offices need independence to ensure quality and objective statistics are collected. Some aspects of the present statistical information system, such as the classification of firms, transactions, products, and services have lagged behind in the digital transformation. It is challenging to have an estimation for e-commerce following the international guidelines. Data users need more statistics on the scale and the structure of the digital activity to understand the economic development in a digitalized economy. Digital trade is going to raise measurement concerns and data dissemination needs. Various central banks are investigating the issuance of digital currencies, on which data are not reporting at present. Statistical measurement challenges include the growth of small transactions and cross-border services and payments using digital platforms. The use of the electronic device is widely acknowledged and discussed, but it remains mostly undefined in official economic statistics. The digital economy has societal impacts and therefore, for policy purposes, extends beyond the activity formally recorded in national economic statistics. Existing statistics measure the spread of ICTs, but they are less able to keep up with new

and evolving technologies usage by individuals and firms. There is a shortage of statistics on employment in the digital economy, and detailed occupational data are lacking.

V. Conclusion

National statistical offices (NSO) require additional resources and access to source data to be able to implement data compilation improvements and enhancements. The National statistical agencies must be able to access the source data needed to compile macro-economic statistics.Provide national statistical offices with sufficient resources to measure digital products. Methods of estimation must be improved to develop additional indicators for measurement of the digital economy. National agencies should be encouraged to share data required for statistics. Statistical systems must be made more flexible and responsive to the introduction of new and rapidly evolving concepts driven by Information and Communications Technology (ICTs). Statistical agencies shall build a statistical quality framework suited to the internet as a data source. Countries need to collect better statistics and information. The national government, business, and civil society should interact to strengthen the collection of official statistics. National and international organizations should provide access to statistical data through partnerships.

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ІНФОРМАЦІЙНО-НОРМАТИВНЕ ЗАБЕЗПЕЧЕННЯ СИСТЕМИ СТАТИСТИЧНОГО ОЦІНЮВАННЯ ПРАЦІ

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Інформація про працю населення будь-якої країни є доволі багатогранною, а система державного регулювання праці людей стає дедалі складнішою через глобалізацію, міграцію, цифровізацію, віддалену роботу, технології, моделі управління тощо. Зазначене вимагає посилення імперативів і