G20

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DIGITAL ECONOMY TASK FORCE

TOOLKIT FOR MEASURING THE DIGITAL ECONOMY

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1. Introduction

Sound measurement is crucial for informing and guiding policymaking, as it helps policymakers produce precise diagnostics, assess the potential impact of alternative policy options, monitor progress, and evaluate the efficiency and efficacy of implemented policy actions.

The demand for new data, indicators and measurement tools is particularly acute in the case of the digital economy due to the growing role it plays in G20 economies and everyday life, its potential to transform jobs and production, and the fast pace of change that characterises it.

The G20 has taken note of this need in its 2017 Ministerial Declaration, encouraging members to reflect the measurement of the digital economy in their national statistics in a comprehensive way and to review existing statistical frameworks. Following that mandate, and in particular that included in point 10 of the G20 Roadmap for Digitalisation, this G20 Toolkit for Measuring the Digital Economy brings together different methodological approaches and indicators that may be used to monitor the digital transformation, and highlights critical gaps and challenges that G20 countries and IOs involved in digitalization measurement could consider for further work.

The Toolkit aims to provide a first assessment that could serve to propose possible measurement approaches that support evidence-based policymaking, diagnoses the challenges and opportunities of the digital economy, identifies the issues that could be addressed by public policies, and serves as a potential guide for countries to implement standardized measurement activities.

Rather than producing new content, the document focuses on existing indicators and methodologies, in an effort to compile core, standardized and comparable indicators about the digital economy in G20 countries, make them easily accessible, and allow them to serve as a guide for countries to implement measurement activities. Indicators were selected based on previously published statistics on the digital economy and ongoing efforts to develop comparable metrics by major international organizations active in this area. Sources include the Organisation for Economic Co-operation and Development (OECD), the International Telecommunication Union (ITU), the United Nations Conference on Trade and Development (UNCTAD), the European Union, The World Bank Group (WBG), the International Monetary Fund (IMF), and the International Labour Organization (ILO).

More than 30 key existing indicators and methodologies to monitor and assess the size and penetration of the digital economy are organized in four themes according to their main purpose of measurement:

1. **Infrastructure.** This section covers indicators of the development of physical, service and security infrastructures underlying the digital economy. It includes access to mobile and fixed networks, the development of next generation access (NGA) networks, the dynamics of household and business uptake, secure servers infrastructure, and infrastructure for the internet of things.

2. **Empowering society.** This section considers indicators that portray the evolving role of the digital economy in people's life, how they access and use digital technologies, and their abilities to fully exploit their potential. It includes indicators on people's use of the internet, education, financial inclusion and interaction with government, among others.

3. **Innovation and technology adoption.** This theme contains indicators that address innovation in digital technologies, new digitally-enabled business models, the role of ICTs as an engine for innovation, and adoption of ICTs and other emerging technologies by businesses.

4. **Jobs and Growth.** The metrics collected within this section explore the different ways in which digital technologies contribute to economic growth and employment creation. It includes indicators related to the labour market, employment creation, investment in ICTs, value added, international trade, e-commerce, and productivity growth.

To complement these standard measures, the toolkit also includes other studies, surveys, pilot initiatives, and various measurement efforts in G20 countries and international and regional organizations. These cases are intended to serve as examples of initiatives that could improve existing methodologies, deepen our knowledge on specific aspects of the digital economy, and potentially expand coverage to more countries or to new areas within a country.

The rest of the document is organized as follows. Section 2 elaborates on the main gaps and challenges that derive from the analysis of the indicators compiled by the toolkit. It also includes crucial actions that could inform the digital economy measurement agenda of G20 members in the next years. Section 3 presents selected indicators used to measure the digital economy. Finally, section 4 includes initiatives and experiences from G20 countries and organizations.

2 Towards a measurement agenda

The main conclusion of the toolkit is that, even if we only consider existing measurement efforts, there is ample room for improvement, as data are far from being comprehensive, country coverage is limited, timeliness is often an issue, and differences in data collection methodologies and approaches across countries persist.

2.1 Gaps and challenges

We identify two types of gaps: methodological and availability. Methodological gaps relate to what existing indicators measure and how they capture the digital economy, or to what extent they do it. They address issues such as the need to improve existing indicators, identification of new measures to be developed, or the review of data sources and collection methods. Availability gaps are closely linked to effective implementation. Even in areas where international standards to guide statistical collection exist, countries may lack the capacities and resources to implement them systematically, disseminate the resulting information openly, or make efforts to ensure that data are comparable. In what follows we organize the presentation of the main gaps and challenges in the same themes used to classify the indicators in the next section of the toolkit, according to their main purpose of measurement.

Infrastructure

Connectivity is well covered by standard indicators, but digital platforms, an important dimension within the infrastructure topic, is not treated and deserves an assessment. The digital economy would be incompletely measured without taking into consideration the size and impact of platforms.

The toolkit includes and indicator to measure machine-to-machine (M2M) communication, one of the main underlying infrastructure technologies of the Internet of Things (IoT), a key emerging technology that drives digitization economy-wide. Although tracking M2M subscriptions is a reasonable proxy, there are other transmission technologies the application of which could be covered by standard indicators.

More generally, there are important difficulties in measuring data flows. G20 members may wish to explore ways to better utilize existing usable data sets.

Empowering society

Indicators about educational attainment and occupations are available and there are independent efforts to produce standards and definitions. We encourage G20 members to continue to participate or start participating in those measurement activities. However, we identify a lack of widespread measurement of skills, abilities and competencies that would allow for cross-country comparison. These are very relevant to reflect the ability of economies to adapt to the digital economy. One example is the absence of systematic data collection on the perception of firms about the abilities and skills that will be demanded in the near future. This is especially the case for developing economies. Moreover, digital access, which can be measured and can be used as an indicator of how the digital economy affects education, does not directly translate into educational attainment or academic outcomes.

Innovation and technology adoption

Measures about the use and quality of emerging technologies, such as artificial intelligence, internet of things, 3D printing, robotics, distributed ledgers or data science-based processes, should be improved to capture their use in different industries and their impact on the change in aggregate and business-level value added. For instance, with a few exceptions, metrics of robotization do not capture increases in the value of robots or their ability to perform tasks, nor they capture the use of robots in services industries, e.g. computer algorithms. We celebrate initiatives to include information on robot use in business ICT use surveys, which some G20 countries have already started to implement.

Jobs and growth

More emphasis should be placed on the development of methodologies to measure digitally-enabled trade and produce related indicators. Related to this, we identify methodological challenges in the collection of e-commerce statistics, such as differences in industry coverage, actors involved, and type of survey used to gather data across countries (e.g. some countries obtain them from household surveys and others from business surveys). Consistent and comparable data on the growth and adoption of e-commerce by both individuals and businesses in all industries should be helpful in identifying barriers to trade.

There is a clear gap in our ability to measure job creation associated to the digital economy, for example the nature and evolution of independent or freelance work. Current definitions and indicators are sometimes problematic, e.g. jobs covered under “alternate work arrangements”, and it would be important to discuss how best to define and measure these indicators across countries.

General challenges

Existing top down indicators are limited in their ability to capture the complexities of the digital economy. G20 members may wish to explore ways to better utilize existing usable data sets and use complementary bottom up measurement methodologies whenever possible. Moreover, current indicators do not always allow for gender and age breakdowns to examine use of new technologies, jobs, or potential biases in how society is affected by digitization.

Current measurement efforts do not always reflect the socio-economic impact of the digital transformation or the upstream and downstream consequences on the economy as a whole as opposed to just the digital share. For example, digital platforms pose upstream and downstream methodology issues. Upstream issues arise when the dynamics of the digital economy impacts the internet market, for example when a data driven business model affects the boundary of commercial feasibility of internet access in a developing country. Downstream issues arise when digital disruption impacts the product/service market: the emergence of digital platforms affects hospitality, local transport, real estate business, and other activities. Having this type of indicators being developed could help to create targeted approaches to develop and implement digital teches, government and actors from civil society to explore new sources of data, tools, and alternatives to exploit available data could have a positive impact on countries' measurement capacities.

On a related point, household and business surveys are used in several G20 countries to measure the digital economy, but the use of administrative records, which could reduce the cost of performing some statistical activities to measure the digital economy, remains very limited.

Information on the extent of regional disparities or dispersion within countries is often absent from key standardized measures of household or business uptake of digital technologies. Although surveys generally collect regional codes, indicators are usually not tabulated by that dimension in international comparisons. Collaboration between international organizations and G20 countries to make regional data available, for example by advancing on methods to make microdata more accessible, should help to make progress on this front.

Current indicators may not adequately reflect the transformation unleashed by digitalization and the value added to national economies, particularly in developing countries. We see a challenge to report on the rate of growth of digitalization across various indicators to high-