

Measuring the Digital Economy

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Abstract

India's digital consumer base is the second largest in the world and growing at the second-fastest rate amongst major economies. As per the findings of report by the Government of India's Ministry for Electronics and Information Technology (MEITY) 'India's Trillion-Dollar Digital economy', half the potential economic value of \$1 trillion in 2025 could come from new digital ecosystems in diverse sectors, including financial services, agriculture, healthcare, logistics, jobs and skills market, e-governance and other areas. The growing role of the digital economy in daily life has heightened demand for new data and measurement tools. However, absence of an internationally agreed definition of the digital economy, and of standardized methodologies to measure it and sparsity of statistical data are challenges in measuring Digital economy. This paper examines the present coverage of Digital economy in the Indian National Accounts Statistics (INAS) and also presents measurement challenges for macroeconomic statistics.

Keywords: *macroeconomic statistics, national accounts, value added*

JEL Classification: *C82, P44*

Introduction

India's digital consumer base is the second largest in the world and growing at the second-fastest rate amongst major economies. As per the findings of report by the Government of India's Ministry for Electronics and Information Technology (MEITY) '**India's Trillion-Dollar Digital economy**', half the potential economic value of \$1 trillion in 2025 could come from new digital ecosystems in diverse sectors, including financial services, agriculture, healthcare, logistics, jobs and skills market, e-governance and other areas. The growing role of the digital economy in daily life has heightened demand for new data and measurement tools. The digital sector covers the core activities of digitalization, ICT goods and services, online platforms, and platform-enabled activities such as the sharing economy. Digitalization has penetrated many activities, and, indeed, almost the entire economy could be included in the "digital economy" broadly defined. While the term "digital sector" refers to a concrete perimeter of economic activities, the term "digital economy" is often used to indicate that digitalization (e.g., the use of Internet) has spread across all sectors of the economy, from agriculture to warehousing. While the Indian National Accounts Statistics (INAS) captures many aspects of the Indian digital economy in the National Accounts, it does not separately identify all digital activities, nor trace the estimated aggregate economic performance to its digital origins. However, absence of an internationally agreed definition of the digital economy, and of standardized methodologies to measure it and sparsity of statistical data are challenges in measuring Digital economy.

This paper examines the present coverage of Digital sector in the Indian National Accounts Statistics (INAS) and also presents experimental estimates of digital sector in the Indian economy followed by a review of measurement challenges.

2. Definition of Digital Sector

As this paper focuses on a digital sector covering core activities of digitalization, ICT goods and services, online platforms etc, digital sector and products definition as per ISIC sectors has been adopted for estimating the digital sector in INAS. The latest version of the United Nations' *International Standard Industrial Classification* (ISIC) defines an *Information and Communications Technology (ICT) sector* and a *Content and Media Sector*. The general principle used to identify ICT economic activities (industries) is that the production of a candidate industry must primarily be intended to fulfill or enable the function of information processing and communication by electronic means, including transmission and display. Accordingly, activities in the digital sector are grouped into ICT manufacturing industries, ICT trade industries and ICT services industries as per following classification:

ICT manufacturing industries

2610 Manufacture of electronic components and boards
2620 Manufacture of computers and peripheral equipment
2630 Manufacture of communication equipment
2640 Manufacture of consumer electronics
2680 Manufacture of magnetic and optical media

ICT trade industries

4651 Wholesale of computers, computer peripheral equipment and software
4652 Wholesale of electronic and telecommunications equipment and parts

ICT services industries

5820 Software publishing
61 Telecommunications
6110 Wired telecommunications activities
6120 Wireless telecommunications activities
6130 Satellite telecommunications activities
6190 Other telecommunications activities
62 Computer programming, consultancy and related activities
6201 Computer programming activities
6202 Computer consultancy and computer facilities management activities
6209 Other information technology and computer service activities
631 Data processing, hosting and related activities; web portals

6311 Data processing, hosting and related activities
6312 Web portals
951 Repair of computers and communication equipment
9511 Repair of computers and peripheral equipment
9512 Repair of communication equipment Alternative aggregation

The general principle (definition) used for the identification of activities in the content and media sector is that the production (goods and services) of a candidate industry must primarily be intended to inform, educate and/or entertain humans through mass communication media. These industries are engaged in the production, publishing and/or the distribution of content (information, cultural and entertainment products), where content corresponds to an organized message intended for human beings.

Accordingly, activities in the Content and media sector are classified as:

581 Publishing of books, periodicals and other publishing activities

5811 Book publishing

5812 Publishing of directories and mailing lists

5813 Publishing of newspapers, journals and periodicals

5819 Other publishing activities

591 Motion picture, video and television programme activities

5911 Motion picture, video and television programme production activities

5912 Motion picture, video and television programme post-production activities

5913 Motion picture, video and television programme distribution activities

5914 Motion picture projection activities

592 Sound recording and music publishing activities

60 Programming and broadcasting activities

6010 Radio broadcasting

6020 Television programming and broadcasting activities

639 Other information service activities

6391 News agency activities

6399 Other information service activities n.e.c.

It is to be noted that revisions to these classifications have not kept up with the recent growth of digital activities and products. These are “online platforms” (e.g., Google, Facebook, Alibaba) and their products, platform-enabled services” (e.g., Airbnb) and new

forms of financial services (i.e., Fintech). Another issue is the treatment of data as a product—under current international guidelines, databases are products, but not data itself.

3. Coverage of Digital Sector in the Indian National Accounts

The activities under ICT manufacturing sector are covered in the INAS under the following compilation categories of Manufacturing sector.

261+264+268	Manufacture of electronic component, consumer electronics, magnetic and optical media
262	Manufacture of computer and peripheral equipment
263	Manufacture of communication equipments
265+266+267	Manufacture of optical and electronics products n.e.c

As regards ICT Trade and services industries, the following activities pertaining to ICT sector are covered in national accounts.

Trade:

- 4651 Wholesale of computers and computer peripheral equipment and software
- 4652 Wholesale of radio, television and other consumer electronics including CD/ DVD players and recorders

Services:

- 61 Telecommunications
 - 61101 Basic telephone services -activities of basic telecom services: telephone, telex and telegraph (includes activities of STD/ISD booths)
 - 61103 Cable television
 - 61202 Wireless infrastructure services
 - 61209 Cellular mobile phone service
 - 61900 Internet service provider, Payment gateways, Portals
 - 62013 Software services (including Software Publishing)
 - 63111 Database services
 - 63999 Information technology enabled service/BPO
 - 95299 Repair of other personal and household goods (include repairs of computers and peripheral equipment)

In so far as the Content and Media sector are concerned the following categories are included the following activities are covered in the INAS.

- 58111 Publishing of books, brochures, leaflets and similar publications, including

- publishing encyclopedias (including on CD-ROM)
- 58112 Publishing of atlases, maps and charts
- 58131 Publishing of newspapers
- 58132 Publishing of journals and periodicals
- 59111 Animation , media content provider
- 59113 Production of television programmes or television commercials
- 59131 Motion picture distribution
- 59133 Distribution of television programme
- 59141 Motion picture or video tape projection in cinemas, in the open air or in other projection facilities
- 59142 Activities of cine-clubs
- 60 Programming and Broadcasting Activities

4. Methodology of Estimating Value added of the Digital sector

Statistical data available to assess value in the digital economy mainly cover the Digital sectors defined as per ISIC Rev. 4. GVA of ICT manufacturing industries is estimated separately for the Corporate sector and Household sector. Corporate sector GVA is based on the analysis of budgets, accounts of public sector enterprises and companies in the private corporate sector (MCA data base) and Annual Survey of Industries (ASI) results for Proprietorships & Partnerships (Quasi Corporate sector). When ASI results are not available, Index of Industrial production (IIP) growth rates are used to move the ASI based figures available for the previous year. The Household sector GVA estimates are obtained as a product of effective labour Input and corresponding GVA per effective labour for the base year (2011-12). The 2011-12 estimates of effective labour Input is obtained from National Sample Survey(NSS) employment and unemployment survey (EUS) 2011-12 and GVA per effective labour is compiled from NSS survey results of unincorporated enterprises(2010-11) for that survey year and moved forward to 2011-12 using appropriate WPI. This is then used to estimate compilation categorywise estimates for 2011-12. For the following years, compilation category-wise ASI growth is used to move the base year estimates. For the years when ASI results are not available, IIP growth rates are used to move the previous year's figure.

GVA of ICT trade and service industries are estimated separately for General Government, Public and Private corporations sector and Household sector. The Corporations Sector and General Government sector GVA estimates are based on analysis of budgets, accounts of public sector enterprises and companies in the private corporate sector (MCA data base). For the household sector, base year estimates are compiled using NSS quinquennial surveys. The base year estimates of 2011-12 have been prepared using NSS enterprise survey (NSS 67th round) and NSS employment and unemployment survey (NSS 68th round). For subsequent years, the base year estimates are extrapolated using suitable indicators. The indicators used are corporate performance, tax data, minutes of usage of mobile and internet connections etc.

In volume terms, value added by digital activity was estimated by single deflation method using price deflators like CPI and WPI as used in the National Accounts for manufacturing sector and various service sector estimates.

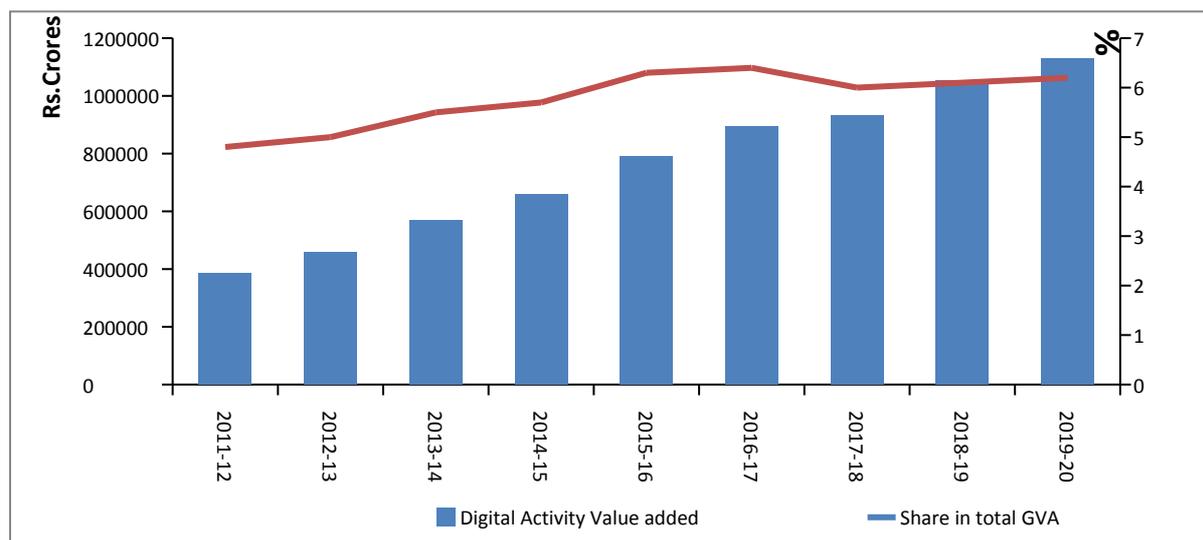
5. Value added estimates of Digital Sector in INAS

The estimates of digital activities (nominal and in volume terms) from 2011-12 to 2019-20 are presented in this section.

Table 1: Digital Sector Value Added (Rs. Crores) and Share in Aggregate Value Added (%), from 2011-12 to 2019-20

Year	Current Prices (In Rs. Crores)		Constant prices (in Rs. Crores)		
	GVA (ICT Sector)	% Share in Aggregate GVA	(%growth) Aggregate GVA	GVA (ICT Sector)	% growth (ICT sector)
2011-12	385410	4.8		385410	
2012-13	456752	5.0	5.4	428611	11.2
2013-14	568827	5.5	6.1	504737	17.8
2014-15	659072	5.7	7.2	574121	13.7
2015-16	789594	6.3	8.0	703297	22.5
2016-17	895235	6.4	8.0	781946	11.2
2017-18	932184	6.0	6.6	790991	1.2
2018-19	1052969	6.1	6.0	854270	8.0
2019-20	1128654	6.2	3.9	899371	5.3

Figure 1: Digital Sector Value Added (Rs. Crores) and Share in Aggregate Value Added (%), from 2011-12 to 2019-20, Current Prices



6. Conclusions

Rapid progress in digitalisation has increased the demand for statistical insights into digital activities in the economy. In this paper, an attempt has been made to measure digital sector using separately identifiable digital products from the INAS based on ISIC. It is acknowledged that this digital activity measurement is limited in scope. Hence, the measurement in this paper provides “lower-bound” insights into digital activities. Most of the gains from the digital economy are likely to result from the digitalization of all the sectors of an economy, and not only the digital sector. Nonetheless, the availability of statistical data is limited in this area and there is an insufficient level of disaggregation. Despite the increase in access to ICT over time, the share of this ICT sector’s value added in INAS during the last decade has remained at 5% - 6 %. As share of digital sector in the economy could be much higher, further research to understand more about the digital economy is therefore a priority. In volume terms, apart from the financial year 2017-18, growth in the digital activities significantly outpaced growth in aggregate economy.

Transactions related to Digital intermediaries like airbnb, uber etc.,(registered as unlisted corporates) are captured to some extent in the accounts of service providers. At present purchases/ transactions made online by households/ corporates are captured as part of NSS enterprise surveys/ Accounts of enterprises. If information on digital transactions are required seperately, then additional questions may have to be introduced in the survey schedules relating to online transactions. Furthermore, GDP already includes an imputation for services of owner-occupied dwellings that captures part of the value of the peer-to-peer rentals. Also as tax data and labor force surveys are used in compilation of GVA, we can presume that sharing economy is included to some extent. Retail and wholesale services and margins from digitally ordered or platform enabled online transactions are also covered to the extent they are a part of corporate data base used in compilation of national accounts. However, data is not available to impute production free online content/media, or of free software. Some open source software may be captured by methods used to compile GDP as software production estimates are based on input costs, including earnings of software coders.

Emerging digitalised products (such as Air BnB, UBER transport services), Payments bank, credit card operations, E-commerce, peer-to-peer transactions and new forms of financial services (i.e., Fintech) need to be captured. While the production of some of these digitalised products are embedded in the source data under existing product classifications, they are not separately identified. Specific measurement challenges for national accounts are measurement of the price and volume of “digital” goods and services. There is a need for development of indexes for digital products matching in composition of the digital product aggregates in the national accounts which could be used as deflators. Free digital contents (e.g., Google, Facebook,) that are provided without a market transaction between the final user of the content and the producer of the content need to be captured. The use of the System of National Accounts for the purpose of measuring

emerging areas of digital economy present conceptual challenges associated with translating the new economic activities into statistical data. One challenge concerns the intangible nature of digital data and intelligence, which are major determinants of value creation in the digital economy and therefore is a potential area for future research and development.

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