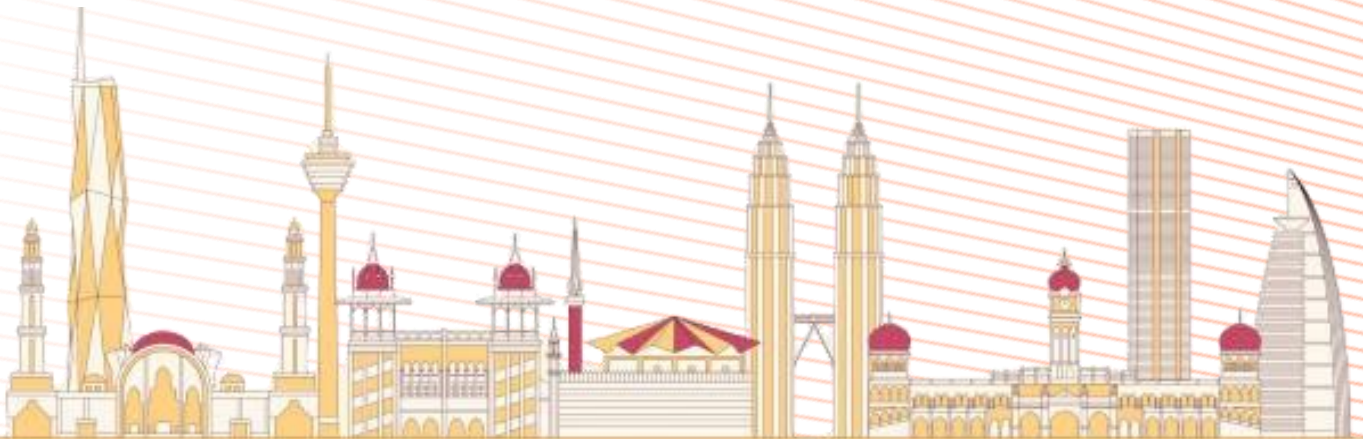


NOTA TEKNIKAL

TECHNICAL NOTES



A) CONCEPT AND DEFINITION OF DIGITAL ECONOMY

The Malaysia Digital Economy 2025 publication presents a comprehensive overview of the nation's digital economy, compiling data from the Survey Usage of ICT & E-Commerce by Establishment (ICTEC) 2024, Quarterly Services Statistics: Information and Communication 2024, ICT Use and Access by Individuals and Households Survey Report (ICTHS) 2024, Information and Communication Technology Satellite Account (ICTSA) 2024, Quarterly Services Statistics (QSS), and digital economy indicators by the Department of Statistics Malaysia (DOSM) and relevant agencies. The publication integrates both monetary and non-monetary indicators to highlight how businesses, households, and individuals are embracing the digital age. The publication plays a crucial role in supporting the formulation of informed policies and strategies for the advancement of ICT and e-commerce in Malaysia.

1. CONCEPT OF DIGITAL ECONOMY

The digital economy has advanced as a result of ICT advancements, cloud computing, artificial intelligence, and other breakthroughs. In this economy, both individuals and businesses are increasingly dependent on digital mechanisms of exchange for economic and social purposes.

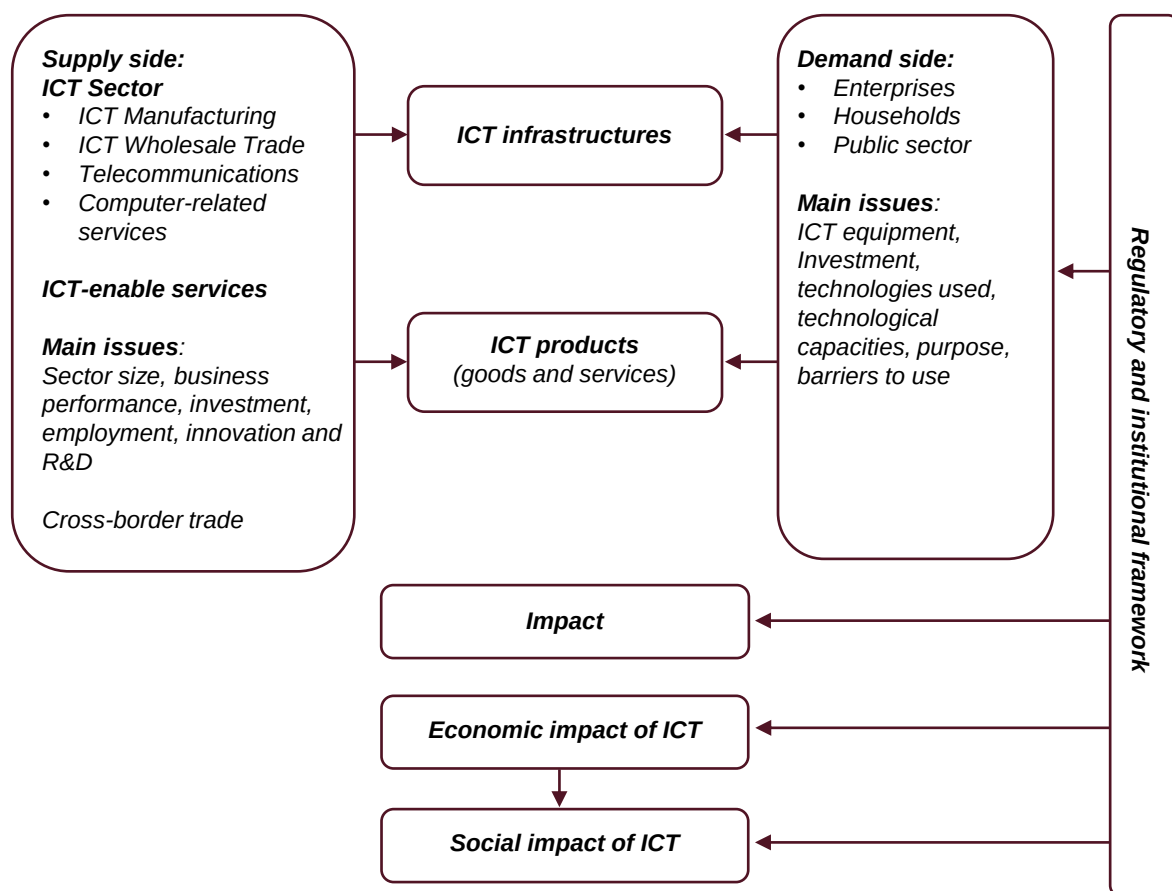
The term 'digital economy' has become widely used to describe how digital technology is altering production (supply) and consumption (demand) patterns. The different technologies and economic aspects of the digital economy can be broken down into three broad components (UNCTAD, 2019):

- i. Core aspects or foundational aspects of the digital economy, which comprise fundamental innovations (semiconductors, processors), core technologies (computers, telecommunication devices) and enabling infrastructures (Internet and telecoms networks).*
- ii. Digital and information technology (IT) sectors, which produce key products or services that rely on core digital technologies, including digital platforms, mobile applications and payment services. The digital economy is to a high degree affected by innovative services in these sectors, which are making a growing contribution to economies, as well as enabling potential spillover effects to other sectors.*

- iii. A wider set of digitalising sectors, which includes those where digital products and services are being increasingly used (e.g., for e-commerce). Even if change is incremental, many sectors of the economy are being digitalised in this way. This includes digitally enabled sectors in which new activities or business models have emerged and are being transformed as a result of digital technologies. Examples include finance, media, tourism and transportation. Moreover, although less often highlighted, digitally literate or skilled workers, consumers, buyers and users are crucial for the growth of the digitalised economy.

At present, specific elements of the digital economy can be quantified according to the components or 'building blocks' of supply and demand as shown in **Figure A.1**.

Figure A.1 Building Blocks of The Digital Economy



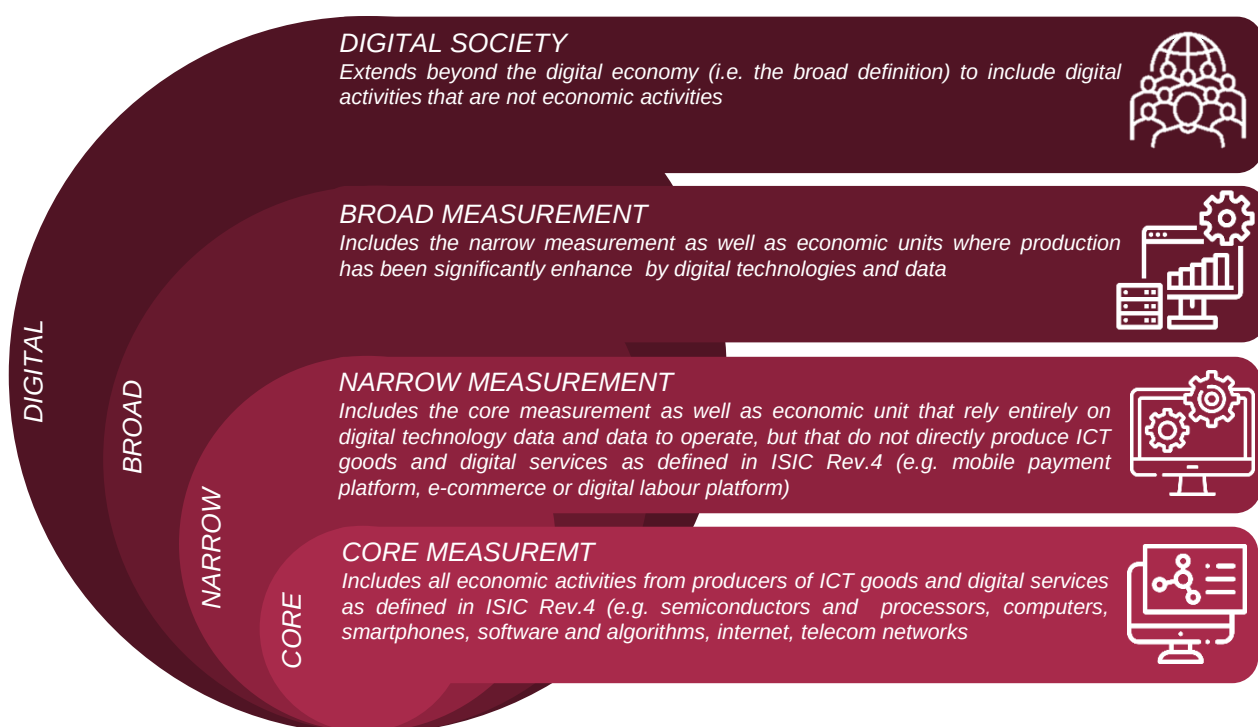
Note
Source: OECD (2005)

In terms of sector, there is not yet a broadly recognised definition of the digital economy, however the G20 Roadmap offers a first effort to a definition by distinguishing between three levels of measurement. In its broadest sense, the digital economy currently encompasses every economic sector; it has been described as;

“All economic activity reliant on, or significantly enhanced by the use of digital inputs, including digital technologies, digital infrastructure, digital services and data. It refers to all producers and consumers, including government, that are utilising these digital inputs in their economic activities” (OECD, 2020).

The OECD definition of the digital economy provided above is translated in a measurement perspective built around four layers, moving from the centre towards broader definitions in its outer layers.

Figure A.2 Different Layers of Digital Economy



Note:

Source: OECD, 2020, A G20 Roadmap toward a Common Framework for Measuring the Digital Economy: A Report for the G20 Digital Economy Task Force (DETF), OECD Publishing, Paris.

Recent analysis in the Digital Economy Report 2024 by UNCTAD underscores the critical intersection of digitalisation and sustainability. UNCTAD emphasises the need to address the environmental impacts of digital technologies across their life cycle, from resource extraction to energy consumption and waste management. Simultaneously, digital innovations are widely acknowledged as tools to enhance efficiency, reduce emissions, and support environmental preservation efforts. The digital economy serves as a vital driver for equitable and sustainable development, potentially bridging digital divides and fostering environmentally conscious growth when guided by coordinated global efforts.

In Malaysia, the concept of the digital economy is defined as the economic and social activities that involve the production and utilisation of digital technology by individuals, businesses, and government (MyDIGITAL, 2021). This encompasses a wide range of activities facilitated by digital tools and platforms, from e-commerce to digital public services. The goal of Malaysia's digital transformation, as outlined in the MyDIGITAL initiative, is to leverage this digital economy to foster economic growth, improve productivity, and create more high-paying jobs while ensuring inclusive and sustainable development across all sectors of society.

B) INFORMATION AND COMMUNICATION TECHNOLOGY SATELLITE ACCOUNT (ICTSA)

1. INTRODUCTION

Information and Communication Technology Satellite Account (ICTSA) of Malaysia 2024 is based on the System of National Accounts (SNA) 2008, the OECD Guide to Measuring the Information Society 2011 and the OECD Internet Economy Outlook 2012. The concepts and definitions are adapted to Malaysia's requirement.

2. ESTABLISHMENT OF ICTSA

The compilation of ICTSA is made possible due to the well established of System of National Accounts in Malaysia. The term 'satellite account' is adopted to reflect the nature of the account developed. It is a 'satellite' to the core set of National Accounts that presents additional information which is beyond the available information provided in the National Accounts.

This satellite information focuses on a particular aspect of the economy for example contribution of ICT to the nation. It also permits further linkages to additional information specific to ICT such as income, exports, imports and employment. ICT consists of industries such as manufacturing, trade, services and content & media.

The development of satellite account is a systematic statistical measurement that applies concepts, definitions and classification which are based on international standard to enable comparison among countries. Various information available in different agencies is compiled to provide holistic and better picture of the impact of ICT industry in Malaysia.

3. CONCEPTS AND DEFINITIONS

- a. Information and Communication Technology (ICT)** refers to the technologies and services that enable information to be accessed, stored, processed, transformed, manipulated and disseminated, including the transmission or communication of voice, image and/or data over a variety of transmission media.
- b. ICT industry** refers to the industries which produce ICT products as primary activities. Details of ICT industry are described in the Classification Section. The main categories of ICT industry in the compilation of ICTSA are as follows:

1. *ICT manufacturing*
2. *ICT trade*
3. *ICT services*
4. *Content and media*

c. Non ICT industries refers to the industries other than ICT industries that produce ICT products.

d. The details of ICT products are listed in the Classification Section. The main categories of ICT products are as follows:

1. *ICT goods*

- 1.1. *Computers and peripheral equipment*
- 1.2. *Communication equipment*
- 1.3. *Consumer electronic equipment*
- 1.4. *Miscellaneous ICT components and goods*

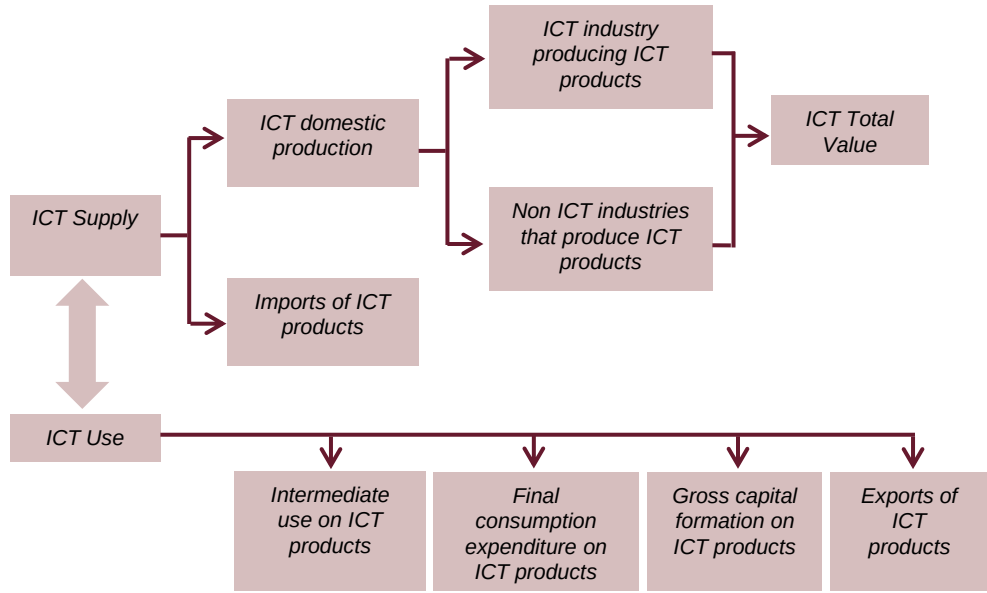
2. *ICT services*

- 2.1. *Manufacturing services for ICT equipment*
- 2.2. *Business and productivity software and licensing services*
- 2.3. *Information technology consultancy and services*
- 2.4. *Telecommunications services*
- 2.5. *Leasing or rental services for ICT equipment*
- 2.6. *Other ICT services*

3. *Content and media products*

- 3.1. *Printed and other text-based content on physical media, and related services*
- 3.2. *Motion picture, video, television and radio content, and related services*
- 3.3. *Music content and related services*
- 3.4. *Games software*
- 3.5. *On-line content and related services*
- 3.6. *Other content and related services*

e. Schematic view of ICTSA



f. E-commerce transaction is the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders. E-commerce transaction can be between enterprises, households, individuals, governments and other public or private organisations.

Method of payment and the ultimate delivery of the e-commerce goods or services might be done through computer network/internet or traditionally.

E-commerce transactions include orders made in web pages, extranet or Electronic Data Interchange (EDI). Nevertheless, orders made by telephone calls, facsimile or manually typed e-mail are not categorised as an e-commerce transactions.

g. E-Commerce of non ICT industries is an industries that is not categorised under the ICT industry classification.

h. ICT to economy consists of ICT industry and e-commerce.

4. CODE AND CLASSIFICTAION

The code and classification of ICT industry is based on Malaysia Standard Industrial Classification (MSIC) 2008 Ver.1.0. which is in concordance with International Standard Industrial Classification of All Economic Activities (ISIC) Rev. 4. The code and classification of ICT products is based on Malaysian Classification of Products by Activity (MCPA) 2009 which conforms with Central Products Classification (CPC) Ver. 2.

a. ICT industry

<i>Description</i>	<i>ISIC Rev. 4</i>	<i>MSIC 2008</i>
1. ICT manufacturing		
1.1 <i>Computers and peripheral equipment</i>		
1.1.1 <i>Manufacture of computers and peripheral equipment</i>	2620	26201, 26202
1.2 <i>Electronic components & boards, communication equipment and consumer electronics</i>		
1.2.1 <i>Manufacture of electronic components and boards</i>	2610	26101, 26102, 26103, 26104, 26105, 26109
1.2.2 <i>Manufacture of communication equipment</i>	2630	26300
1.2.3 <i>Manufacture of consumer electronics</i>	2640	26400
1.2.4 <i>Manufacture of magnetic and optical media</i>	2680	26800
2. ICT trade		
2.1 <i>Wholesale trade</i>		
2.1.1 <i>Wholesale of sports goods, games, leather, travelling goods and musical instruments</i>	4643	46432, 46434
2.1.2 <i>Wholesale of other household goods n.e.c.</i>	4649	46496
2.1.3 <i>Wholesale of computers, computer peripheral equipment and software</i>	4651	46510
2.1.4 <i>Wholesale of electronic and telecommunications equipment and parts</i>	4652	46521, 46522
2.1.5 <i>Wholesale of other machinery and equipment</i>	4659	46593
2.1.6 <i>Wholesale of waste and scrap and other products n.e.c.</i>	4669	46699
2.2 <i>Retail trade</i>		
2.2.1 <i>Retail sale of computers, peripheral units, software and telecommunications equipment in specialized stores</i>	4741	47411, 47412, 47413
2.2.2 <i>Retail sale of audio and video equipment in specialized stores</i>	4742	47420
2.2.3 <i>Retail sale of electrical household appliances, furniture, lighting equipment and other household articles in specialized stores</i>	4759	47597, 47598
2.2.4 <i>Retail sale of books, newspapers and stationary in specialized stores</i>	4761	47611
2.2.5 <i>Retail sale of music and video recordings in specialized stores</i>	4762	47620
2.2.6 <i>Retail sale of games and toys in specialized stores</i>	4764	47640
2.2.7 <i>Other retail sale of new goods in specialized stores</i>	4773	47731

<i>Description</i>	<i>ISIC Rev. 4</i>	<i>MSIC 2008</i>
2.2.8 Retail sale of second-hand goods	4774	47742
2.2.9 Retail sale via stall and market of other goods	4789	47892, 47893, 47894, 47895
2.2.10 Retail sale via mail order houses or via Internet	4791	47911, 47912, 47913, 47914
2.2.11 Other retail sale not in stores, stalls or markets	4799	47992
3. ICT services		
3.1 Telecommunications		
3.1.1 Wired telecommunications activities	6110	61101, 61102
3.1.2 Wireless telecommunications activities	6120	61201, 61202
3.1.3 Satellite telecommunications activities	6130	61300
3.1.4 Other telecommunications activities	6190	61901, 61902, 61903, 61904, 61905, 61909
3.2 Computer programming, consultancy, information and related activities		
3.2.1 Computer programming activities	6201	62010
3.2.2 Computer consultancy and computer facilities management activities	6202	62021, 62022
3.2.3 Other information technology and computer service activities	6209	62091, 62099
3.2.4 Data processing, hosting and related activities	6311	63111, 63112
3.2.5 Web portals	6312	63120
3.3 Other ICT services		
3.3.1 Repair of machinery	3312	33120
3.3.2 Repair of electronic and optical equipment	3313	33131, 33133
3.3.3 Repair of electrical equipment	3314	33140
3.3.4 Installation of industrial machinery and equipment	3320	33200
3.3.5 Electrical installation	4321	43212, 43213, 43214, 43216
3.3.6 Plumbing, heat and air-conditioning installation	4322	43223
3.3.7 Publishing of ready-made (non-customized) software	5820	58201, 58202, 58203
3.3.8 Research and experimental development on natural sciences and engineering	7210	72106
3.3.9 Other professional, scientific and technical activities n.e.c.	7490	74903

<i>Description</i>	<i>ISIC Rev. 4</i>	<i>MSIC 2008</i>
3.3.10 Security systems service activities	8020	80200
3.3.11 General public administration activities	8411	84111, 84112
3.3.12 Repair of computers and peripheral equipment	9511	95111, 95112, 95113
3.3.13 Repair of communication equipment	9512	95121, 95122, 95123, 95124, 95125, 95126, 95127
3.3.14 Repair of consumer electronics	9521	95211, 95212, 95213, 95214
3.3.15 Repair of household appliances and home and garden equipment	9522	95221

4. Content and media

4.1 Publishing of books, periodicals and other publishing activities	1811, 1812, 1820, 5811, 5812, 5813, 5819, 8219	18110, 18120, 18200, 58110, 58120, 58130, 58190, 82196, 82199
4.2 Motion picture, video and television programme activities	5911, 5912, 5913, 5914, 7410, 7420, 9000	59110, 59120, 59130, 59140, 74102, 74200, 90009
4.3 Other content and media		
4.3.1 Sound recording and music publishing activities	5920	59200
4.3.2 Programming and broadcasting activities	6010, 6020	60100, 60200
4.3.3 Other information service activities	6391, 6399, 8220, 9329	63910, 63990, 82200, 93297

b. ICT products

<i>Description</i>	<i>CPC Ver. 2</i>	<i>MCPA 2009 (5 Digit)</i>
1. ICT goods		
1.1 Computers and peripheral equipment	45142, 45221, 45222, 45230, 45240, 45250, 45261, 45262, 45263, 45264, 45265, 45266, 45269, 45271, 45272, 45289, 45290, 47315, 47550	26201, 26202, 28170
1.2 Communication equipment	46921, 47211, 47212, 47213, 47221, 47222, 47223, 47401, 54612, 54613	26300, 43216

<i>Description</i>	<i>CPC Ver. 2</i>	<i>MCPA 2009 (5 Digit)</i>
1.3 Consumer electronic equipment	38581, 47214, 47215, 47311, 47312, 47313, 47314, 47321, 47323, 47330, 47402, 48321, 48322, 48323, 48324, 48330, 48353, 88748	26400, 26701, 26702, 32400
1.4 Miscellaneous ICT components and goods	45281, 47130, 47140, 47150, 47160, 47173, 47403, 47530, 47540, 47590, 47910, 47920, 48315, 48354, 48220, 48244	26101, 26102, 26104, 26105, 26109, 26511, 26800, 32909
2. ICT services		
2.1 Manufacturing services for ICT equipment	88741, 88742, 88743, 88744, 88749	26103
2.2 Business and productivity software and licensing services	47811, 47812, 47813, 47814, 47821, 47829, 73311, 81129, 83143, 84341, 84342, 84392, 85220, 85230	58201, 58203, 72106, 74903, 80200
2.3 Information technology consultancy and services	83117, 83131, 83132, 83141, 83142, 83151, 83152, 83159, 83161, 83162	62010, 62021, 62022, 63111, 63112, 70201
2.4 Telecommunications services	84110, 84121, 84122, 84131, 84132, 84140, 84150, 84190, 84210, 84221, 84222, 84290, 85931, 85939	61101, 61201, 61300, 61901, 61902, 61903, 61904, 61905, 61909, 82200
2.5 Leasing or rental services for ICT equipment	73124, 73210, 73215	77292, 77301, 77307
2.6 Other ICT services	54614, 83325, 87120, 87130, 87151, 87152, 87153, 87155, 87331, 87332, 87340, 87350	33120, 33140, 33200, 43213, 43214, 62099, 71102, 95111, 95112, 95113, 95121, 95122, 95123, 95124, 95125, 95126, 95127, 95211, 95212, 95213, 95214, 95221
3. Content and media products		
3.1 Printed and other text-based content on physical media, and related services	32210, 32220, 32230, 32291, 32292, 32299, 32300, 32410, 32420, 32490, 32511, 32530, 32540, 32620, 32630, 32690, 32800, 47691, 47692, 83631, 84311, 85951, 89121	18110, 18120, 58110, 58120, 58130, 58190, 82196, 82199

<i>Description</i>	<i>CPC Ver. 2</i>	<i>MCPA 2009 (5 Digit)</i>
3.2 <i>Motion picture, video, television and radio content, and related services</i>	38950, 47620, 83632, 83919, 84611, 84612, 84621, 84622, 84631, 84632, 84633, 84634, 96121, 96122, 96123, 96131, 96132, 96133, 96134, 96135, 96136, 96137, 96139, 96140, 96150	59110, 59120, 59130, 59140, 60100, 60200, 74102
3.3 <i>Music content and related services</i>	32520, 47610, 89123, 96111, 96112, 96113	18200, 59200
3.4 <i>Games software</i>	38582, 47822, 84391	58202
3.5 <i>On-line content and related services</i>	73312, 83633, 84311, 84312, 84313, 84321, 84322, 84331, 84332, 84393, 84394, 84399	63120
3.6 <i>Other content and related services</i>	38941, 38942, 47699, 73320, 83611, 83620, 83639, 83811, 83812, 83813, 83814, 83815, 83819, 83820, 83940, 84410, 84420, 85991, 89110, 96330	63910, 63990, 73100, 74200, 90001, 90002, 90003, 90004, 90005, 90006, 90007, 90009

5. PRODUCTION ACCOUNTS OF ICT INDUSTRY

- a. **Gross Domestic Product (GDP)** is the total value of all goods and services produced in a certain period after deducting the cost of goods and services used up in the process of production. This value is before deducting the allowances for consumption of fixed capital i.e. the sum of value added of resident producer in producers' prices plus import duties. GDP is equivalent to expenditure on the GDP (in purchasers' prices) i.e. the sum of all components of final expenditure on goods and services less imports of goods and services.

GDP can be measured by using three approaches namely Production, Expenditure and Income Approach.

- b. **Value added** is the difference between output and intermediate consumption. It represents the added value of goods and services by economic activity. Hence, it is approximately equivalent to commercial profit, salaries and wages, depreciation and indirect taxes; plus interest paid less interest received.
- c. **Gross Value Added of ICT Industry (GVAICT)** is the sum of Gross Value Added of all ICT industry.

6. GENERATION INCOME ACCOUNTS OF ICT INDUSTRY

- a. **Compensation of employees** includes remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done during the accounting period.
- b. **Gross operating surplus** refers the operating surplus before deducting the consumption of fixed capital and mixed income.
 - i. **Operating surplus** refers to measures the surplus or deficit accruing from processes of production before deducting any explicit or implicit interest charges, rent or other property income payable on the financial assets, land or other natural resources required to carry on the production. By definition, operating surplus can only be earned by industries.
 - ii. **Mixed income** includes an unknown element of remuneration for work done by the owner of the enterprise or other members of the household, as well as operating surplus accruing from the production.
 - iii. **Consumption of fixed capital** is defined as the decline in the current value of the stock of fixed assets owned and used by a producer during the course of the accounting period as a result of physical deterioration, normal obsolescence or nominal accidental damage.
- c. **Taxes less subsidies on production and imports** consists of taxes on products and other taxes on production less subsidies on product and other subsidies on production.
 - i. **Taxes on products**

Taxes that are payable per unit of some goods or services and usually become payable when they are produced, delivered, sold, transferred or otherwise disposed by their producer. The tax may be a specific amount of money per unit of quantity of a good or service, or it may be calculated ad valorem as a specified percentage of the price per unit or value of the goods or services transacted. For example, sales taxes, excise taxes, import duties, export duties, etc.

ii. Other taxes on production

Other taxes on production consists of all taxes except taxes on products that enterprises incur as a result of engaging in production such as taxes payable on land, fixed assets or labour employed in the production process or certain activities or transactions. Examples of other taxes on production are taxes payable by enterprises for business licenses, payroll taxes, stamp duties, etc.

iii. Subsidies on products

A subsidy payable per unit of a good or service. The subsidy may be a specific amount of money per unit of quantity of a good or service, or it may be calculated ad valorem as a specified percentage of the price per unit of the goods or services. A subsidy on products usually becomes payable when the good or service is produced, sold or imported, but it may be also payable in other circumstances such as when a good is transferred, leased, delivered or used for own consumption or own capital formation.

The subsidy may be designed to influence resident enterprises' levels of production or the prices at which their outputs are sold.

iv. Other subsidies on production

Other subsidies on production consists of subsidies except subsidies on products that resident enterprises may receive as a consequence of engaging in production such as subsidies on payroll or workforce. The subsidy may be designed to influence the remuneration of the institutional units engaged in production.

7. FRAMEWORK OF ICTSA

The basis of ICTSA compilation in Malaysia is the framework of supply and use tables (SUT). However, it only focuses on ICT products and industries. The supply table indicates the goods and services of ICT products that are supplied by each producer. Meanwhile, use table tracks the usage of those ICT products by industries, government, households and exports.

Supply of each product (valued at purchasers' prices) consists of;

- *Domestic production by industry (valued at basic prices);*
- *Imports;*
- *Transport, retail and wholesale trade margins; and*
- *Taxes less subsidies on production and imports.*

Use of each product (valued at purchasers' prices) consists of:

- Intermediate use by industries (products that are consumed by industries in the process of producing other products); and
- Final use by type of expenditure. Final use includes consumption households and government, products that have been capitalised, changes in inventories and exports.

A comprehensive use table includes primary inputs of production namely compensation of employees, gross operating surplus and other taxes less subsidies on products and production for each industry.

The SUT are used to assemble and integrate all data required to produce estimates of economic aggregates related to ICT. Output consists of those goods and services produced within an establishment which become available for use outside that establishment. The value of ICT output is the market value of ICT goods and services. Value added will be computed for ICT industry and non ICT industries which produce ICT products. The following table illustrates the basic structure of SUT.

Supply Table

Supply of product	Output of industries at basic prices* (economic activities)				Imports	Total supply at basic prices	Trade and transport margins	Taxes less subsidies on products	Total supply at purchasers' prices**
	Industry A	Industry B	Industry ...	Total industry (1)					
ICT product A									
ICT product B									
ICT product C	Output by product and by industry				Imports by product		Supply by product		
ICT product									
Total Supply (ICT product)	Total output by industry				Total imports		Total supply by product		

Use Table

Use of product	Intermediate use by industry (economic activities)				Final consumption expenditure	Gross capital formation	Exports	Total use at purchasers' prices**
	Industry A	Industry B	Industry ...	Total intermediate use (1)	(2)	(3)	(4)	(5) = (1) + (2) + (3) + (4)
ICT product A								
ICT product B	Intermediate consumption by product and by industry				Final use by product and by type of expenditure***			
ICT product C								
ICT product ...								
Total use (ICT product)	Total intermediate consumption by industry				Total final use by product and by type of expenditure***			
Compensation of employees								
Gross operating surplus								
Taxes less subsidies on production and imports	Value added by component and by industry							
Industry output at basic prices*								

Note:

* Basic prices is the price received by the producer for a unit of good and service produced as output, excluding any tax payable or including any subsidy receivable on the product as a subsequent of its sales or use. It also excludes any delivery charges invoiced separately by the producer.

** Purchasers' prices is the price paid by the purchaser to take delivery of a good and service at the time and place required by the purchaser. It includes any transport charges paid separately by the purchaser.

*** Type of expenditure refers to the final consumption expenditure, gross capital formation and exports.

8. MEASUREMENT OF E-COMMERCE

Measurement of e-commerce value added is based on the manual OECD Internet Economy Outlook 2012. There are two recommended approaches, which are narrow and broad approaches. Narrow approach only takes into account value added from the wholesale and retail sectors. While, broad approach includes all industries across the economy.

It is assumed that the share of revenue from e-commerce to total revenue for each industry is proportional to the percentage of value added from e-commerce to the total value added for the same industry. Broad approach is used in measuring the e-commerce in Malaysia. E-commerce consists of the value of ICT industry and non ICT industries.

9. DATA SOURCES

The data sources in compiling ICT Satellite Account are as follows:

INDUSTRY / DATA	DATA SOURCES
ICT manufacturing industries	• GDP
ICT trade industries	• Economic Census
ICT services industries	• Annual Survey
Publishing of books, periodicals and other publishing activities	• SUT
Motion picture, video and television programme activities	
Sound recording and music publishing activities	
Programming and broadcasting activities	
Other information service activities	
Non ICT industries	
Exports and imports of ICT goods and services	• External Trade Statistics • Statistics of International Trade in Services
Tax and subsidies	• GDP Income Approach
Government final consumption expenditure	• Financial Accounts of Federal Government, State Government, Local Authorities and Statutory Bodies
Private final consumption expenditure	• GDP • Household Expenditure Survey
Gross capital formation	• GDP • Gross Fixed Capital Formation
Compensation of employees	• GDP Income Approach
Gross operating surplus	• GDP Income Approach

INDUSTRY / DATA	DATA SOURCES
Employment	- Annual Labour Force Survey - Annual Economic Survey - Quarterly Survey of Services - Monthly Manufacturing Survey - Monthly Survey of Wholesale & Retail Trade

10. MAIN TABLES ICTSA

ICTSA comprises of nine (9) tables of each table and the explanation are as follows:

Table A1: ICT industry and non ICT industries that produce ICT products

Table A1 contains the statistics on all industries that produce ICT products. This table derived from SUT 2015 according to the ICT product classification. For the subsequent years, data is based on published Annual GDP.

Table A2.1, A2.2 and A2.3: Supply and use of ICT products

Table A2.1, A2.2 and A2.3 present the statistics on the supply and use of ICT products. The value of supply must be equal to the value of use of ICT product. The data on the supply and use of ICT products are derived from the SUT 2015. For the subsequent years, data are based on published Annual GDP. Industry and products have been selected based on the ICTSA classification. Supply of ICT products data comprises of domestic production of ICT products, imports of ICT products and tax less subsidies on ICT products. Use of ICT products data consists of intermediate use of ICT products, final consumption expenditure of ICT products by households and governments, gross capital formation for ICT products and export of ICT products.

Table A3 and Table A4: Exports and imports of ICT products

Tables A3 and A4 consists the exports and imports statistics for ICT products. Data from goods extracted from the customs declaration (International Trade Statistics) where the compilation is based on the Harmonized Commodity Description and Coding Systems (HS) code. Meanwhile, the value of the exports and imports services is derived from the balance of payments statistics. The arrangement also took into account the recommendations by the 2008 SNA and Balance of Payments and International Investment Position Manual Sixth Edition (BPM6) particularly in implementation on treatment of Goods for Processing from Abroad (GFP) and Manufacturing Services (MS).

Net exports are one of the important variables used to calculate the GDP. When net exports are positive, it shows a trade surplus and when it is negative, it represents a trade deficit.

$$\text{Net Exports} = \text{Exports Value} - \text{Imports Value}$$

Table A5: Income components of ICT industry

Table A5 consists statistics on Income components of ICT industry comprises of compensation of employees, gross operating surplus and taxes less subsidies on production and imports. This statistics is derived using on SUT 2015 according to the ICT industry. For the subsequent years, data is based on published Annual GDP Income Approach.

Table A6: Employment in the ICT industry

Table A6 is statistics on employment data in the ICT industry. The statistics is compiled using Annual Labor Force Survey, Annual Economic Survey, Quarterly Survey of Services, Monthly Manufacturing Survey and Monthly Survey of Wholesale & Retail Trade are obtained by the Department of Statistics Malaysia.

Table A7.1, A7.2 and A7.3: Gross Value Added of ICT Industry

Table A7.1, A7.2 and A7.3 comprise the Value Added statistics of ICT Industry at current prices. The measurement of Gross Value Added of ICT Industry is the sum of Gross Value Added of all ICT industry. Statistics is obtained from published Annual GDP.

Table A8.1 and A8.2: Gross Value Added of e-commerce

There are two table for e-commerce. **Table A8.1** are present the Gross Value Added of e-commerce by ICT industry while **Table A8.2** was Gross Value Added of e-commerce by main sector. Measurement of e-commerce value added is based on the OECD Internet Economy Outlook 2012. Data are based on the percentage of e-commerce revenues by industries from the Economic Census 2016. For the subsequence years, data is based on Usage of ICT and E-Commerce (ICTEC).

Table A9: ICT contribution to economy

Table A9 is statistics to economy which is comprises Gross Value Added of the ICT Industry (**Table A7**) and the Gross Value Added of e-commerce by non ICT industries (**Table A8**).

11. PUBLICATION AND DATA REVISION

This publication presents ICTSA for the year 2015 to 2024. The series will be updated whenever any latest data available.

12. SYMBOLS

- : *negative*
- .. : *not applicable*
- e : *estimate*
- p : *preliminary*
- 0 : *value less than 0.05*
- % : *per cent*

C) INFORMATION & COMMUNICATION SERVICES (QUARTERLY)

1. INTRODUCTION

The data for Information & Communication was collected through the Quarterly Survey of Services and Monthly Survey.

However, for this publication, the data presented commenced from 2020.

2. OBJECTIVES

This publication presents information on revenue/ sales value, number of persons engaged and salaries & wages in Services sector. The main objectives of this survey are to:

- Provide short term indicators of Services sector;*
- Provide input towards the compilation of Quarterly Index of Services;*
- Provide information for the compilation of Quarterly Gross Domestic Product; and*
- Assist the government and other organisation as well as business community in planning and decision making.*

3. SCOPE AND COVERAGE

The surveys cover all registered establishments of the relevant regulatory bodies engaged in Information & Communication.

4. CONCEPTS AND DEFINITIONS

The classification of the industry is based on the Malaysia Standard Industrial Classification 2008 Ver. 1.0. The classification conforms to the International Standard Industrial Classification of All Economic Activities, Revision 4, United Nations Statistics Division. Meanwhile, the concepts of wholesale and retail trade adopted in this publication is based on recommendation in the Manual of International Recommendations for Distributive Trade Statistics 2008 (IRDTS 2008) published by the United Nations Statistics Division.

5. INFORMATION & COMMUNICATION

Refers to activities publishing, motion picture, video & television programme production, sound recording & music publishing, programming & broadcasting, telecommunications services, computer programming, consultancy & related activities and information services.

6. REPORTING UNIT

The reporting unit is an establishment. An establishment is defined as 'an economic unit that engaged in one activity, under a single legal entity and operating in a single physical location'. Each establishment was assigned an industry classification based on its principal activity and not by its parent company.

7. REVENUE

Revenue refers to the amount received and receivable for services rendered and other transactions made during the reference quarter. It comprised both operating and non-operating revenue.

8. NUMBER OF PERSONS ENGAGED

The total number of persons engaged includes all working proprietors and active business partners, unpaid family workers and employees who worked during the last pay period of the reference quarter. It also includes part-time workers in the payroll and persons on strike and short-term leave (sick leave, emergency leave or vacation). Not included are workers on indefinite leave as well as pensioners.

9. SALARIES & WAGES PAID

Salaries & wages paid refers to cash payments, including bonuses, commissions, overtime pay, cost of living allowances and other allowances made to all employees during the reference quarter. The employees' contributions to Employees' Provident Fund (EPF) and Social Security Organisation (SOCSO) are included, while the employer's contributions are excluded. Allowances to working proprietors, working partners and unpaid family workers are also excluded.

10. CONFIDENTIALITY REQUIREMENTS

The information is gathered under the provisions of the Statistics Act 1965 (Revised 1989). Section 5 of this Act requires all establishments services operating in Malaysia to provide actual information or best estimates to the Department. The Act stipulates that the content of individual returns are confidential and only aggregated figures are published. Meanwhile, Section 7 under the same Act provides the penalty to the respondents that could not comply with the surveys undertaken.

11. REVISION POLICY

- For monthly data, subject to changes in data source, revision is t-1 where t refers to current month.*
- For quarterly data, subject to changes in data source, revision is t-1 where t refers to current quarter.*
- For annual data, subject to changes in data source, revision is t-3 where t refers to current year.*

12. METHODOLOGY

12.1 Population

All establishments encompass Quarterly Survey of Services in Information and Communication that consist of 35 industries at five (5) digits based on Malaysia Standard Industrial Classification 2008 Ver 1.0.

12.2 Sampling Frame

From the identified population, establishments that are still operating as at December 2024 were listed as sampling frame.

12.3 Sampling Design

Sampling design of the survey is a one-stage stratified random sampling. Categories of industries at national level have been classified as stratum and the establishment as the sampling unit.

Each stratum (industry) has been set up to four substratum to ensure the distributed sample takes into account the economic characteristics of the industry. The main substratum is heterogeneous covered in full coverage. Whereas, the others homogenous substratum was sampled.

Major substratum includes large-scale establishments that have significant revenue streams in the coverage industry while for second and fourth sub-sectors based on micro, small and medium enterprise (MSMEs) categories.

12.4 Sample size

The main statistics used to estimate the sample size is the total revenue. The formula used in the estimation of the sample size using Neyman Allocation Method is as follows:

$$n = \frac{(\sum N_i S_i)^2}{V + \sum N_i S_i^2}$$

where;

n	=	Sample size
N_i	=	Population size for stratum i
S_i^2	=	Variance for stratum i
V	=	Desired variance

$$V = RSE^2 \cdot \left(\frac{\hat{Y}_i}{Z} \right)^2$$

where;

$\hat{Y}_i$	=	Estimated total revenue for stratum i
RSE	=	Relative standard error
Z	=	Value of confidence level

Sample is distributed to substratum of the industry using method as follows:

$$n_{hi} = \left(\frac{N_h S_h}{\sum N_h S_h} \right) n_i$$

$$h = 2, 3 \text{ and } 4$$

$$i = 1, 2, \dots, k$$

where;

n_{hi} = Sample size for substratum h of stratum i

N_h = Population size for substratum h

S_h = Standard deviation for substratum h

n_i = Sample size for stratum i

h = substratum

i = Stratum

Establishments for the major substratum are categorized into 4 groups, namely large 1, large 2, large 3 and large 4. Establishments of the large 1 category were fully covered while establishments of the large 2, 3 and 4 as well as MSMEs substratum were randomly selected using systematic random sampling.

12.5 Weight

Weighted analysis is done using sampling weight to ensure that the selected sample can reflect population survey. The weights required are the sampling design weight and non-response weight.

The sampling design weight for the establishment at stratum h is as follows:

$$W_h = \frac{N_h}{n_h}, h = 1, \dots, 4$$

where,

N_h = Total population of substratum h ; and

n_h = Total sample of substratum h

Non response weight at substratum h as below:

$$NRW_h = \frac{1}{n'_h/n_h}, \quad h = 1, \dots, 4$$

where;

$$\begin{aligned} n'_h &= \text{Number of response sample for substratum } h; \text{ and} \\ n_h &= \text{Number of sample for substratum } h \end{aligned}$$

The method of calculating the sampling design weight after the survey (adjusted weight) on substratum h as below:

$$W'_h = W_h \times NRW_h, \quad h = 1, \dots, 4$$

where,

$$\begin{aligned} W_h &= \text{Sampling design weight at substratum } h \\ NRW_h &= \text{Non response weight at substratum } h \end{aligned}$$

13. ROUNDING

The sum of component figures may not tally with the sub total or total figures due to rounding.

D) USAGE OF ICT AND E-COMMERCE BY ESTABLISHMENT

1. INTRODUCTION

This report provides information on usage of ICT and e-commerce by establishment for reference year 2023. The data were collected and compiled from Annual E-Commerce Survey in 2024.

The ICT indicators has been developed by the World Summit on the Information Society (WSIS) and was launched in June 2004. The purpose of the core list as a guidance/ input to countries that are conducting ICT surveys. The core list also assists in produce quality and internationally comparable ICT data.

There are 48 ICT indicators in six groups as follows:

- | | |
|---|-----------------|
| • ICT infrastructure and access | - 10 indicators |
| • Usage and access of ICT by households and individuals | - 13 indicators |
| • Usage of ICT by businesses | - 12 indicators |
| • ICT sector (producing) | - 2 indicators |
| • International trade in ICT goods | - 2 indicators |
| • ICT in education | - 9 indicators |

2. LEGAL AUTHORITY

*The Annual E-Commerce Survey is conducts under the **Statistics Act 1965 (Revised 1989)**. Section 5 under this Act requires any establishment operating in Malaysia to provide actual or best estimate information to the Department. According to the Act, the contents of the questionnaire are **confidential** and only aggregate figures are published.*

3. SCOPE AND COVERAGE

*This publication used data from Annual E-Commerce Survey 2024 (reference year 2023). The survey collected information from registered establishments in Agriculture, Mining & quarrying, Manufacturing, Construction and Services sectors. This classifications for industries were referring to Malaysia Standard Industrial Classification (MSIC) 2008 Version 1.0, which is in accordance with the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4 United Nations. The coverage for all sectors encompasses 1,122 categories of industries as shown in **Table 1**.*

Table 1: Number of industries by sector

Sector	Name of Industries
Agriculture*	140
Mining & Quarrying	56
Manufacturing	259
Construction	72
Services	595
Jumlah	1,122

Note:

(*) Entrepreneurs in the Agriculture sector which registered with relevant government agencies for the purpose of receiving aid were NOT covered except palm oil's entrepreneurs.

4. SOURCE OF STATISTICAL FRAME

The main source for the establishment statistics frame is from the Malaysia Statistical Business Register (MSBR), while for the accommodation sub-sector, includes unregistered homestay. MSBR is a list of organisations/ enterprises operating in Malaysia that includes the Register of Companies (ROC), Register of Business (ROB), and Limited Liability Partnership (LLP) registered with the Companies Commission of Malaysia (CCM) as well as organisations registered with local authorities (LA) and professional bodies. The list in MSBR is updated regularly based on surveys and censuses conducted by the Department of Statistics Malaysia (DOSM) and administrative data sources from various agencies. The main source of administrative data is from the CCM.

In addition, DOSM also works together to obtain the latest information from other agencies such as the Employees' Provident Fund (EPF), the Royal Malaysian Customs Department, the Inland Revenue Board (IRB), Social Security Organisation (SOCSO), LA and professional bodies. The frame is updated by taking into account new establishments such as closed down, not in operation, change in activity and location/ correspondence address so as to ensure that the frame is at the most current status.

5. TYPES OF BUSINESS ACTIVITY

Type of business activity refers to both principal and secondary activities. The principal activity refers to the activity to which the establishment devoted most of its resources or activity which derived most of its income. Secondary activities are defined as those incidental or ancillary to the principal activity. The classification of the industry of the establishment is based on the principal activity and is in accordance with the Malaysia Standard Industrial Classification (MSIC), 2008 Ver. 1.0. The MSIC 2008 conforms to the International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4, published by United Nations Statistics Division, with modifications to suit local conditions.

6. CONCEPT AND DEFINITIONS

The industries are categorised into five main sectors namely Agriculture, Mining & quarrying, Manufacturing, Construction and Services. The sectoral definitions include the following activities:

6.1 Agriculture

Agriculture comprising the activities of growing, breeding and rearing of animals and production of animal products, felling of trees and other plants, as well as capture fishery and aquaculture includes the use/ utilisation of plants/ vegetal and animals natural resources. There are four subsectors:

6.1.1 Crops *refer to production of crops products including organic farming. Crops also include the growing of non-perennial and perennial crops for the purpose of seed production;*

6.1.2 Livestocks *refer to animals or bird that are preserved for commercial and breeding purposes. Livestock production includes raising (farming) and breeding of all animals, also production of livestock products such as eggs, milk, honey, etc;*

6.1.3 Forestry and logging includes the production of round wood for the forest based manufacturing industries as well as the extraction and gathering of wild growing non-wood forest product. Besides the production of timber, forestry activities which produce the product through the minimum process, such as fire wood, charcoal, wood chips and round wood used in unprocessed form are also included. These activities can be carried out in natural or forests plantation. This also includes part of the forestry operation based on fee or contract basis; and

6.1.4 Fisheries comprise of fishing and aquaculture, covering the use of fishery resources from marine, brackish or freshwater, with the purpose of capturing or gathering fish, crustaceans, molluscs and other marine organisms and products. Aquaculture refers to the production process involving the culturing or farming (including harvesting) of aquatic organisms using techniques designed to increase the production of the organisms beyond the natural capacity of the environment.

6.2 Mining & Quarrying

Mining & quarrying include the extraction of minerals occurring naturally as solids (coal and ores), liquids (petroleum) or gases (natural gas). Extraction can be achieved by different methods such as underground or surface mining, well operation, seabed mining, etc. However, the sub-sector of mineral mining & quarrying was not covered in this publication.

6.3 Manufacturing

The physical or chemical transformation of materials or components into new products, whether the work is performed by power-driven machines or by hand, whether it is done in a factory or in the worker's home, and whether the products are sold at wholesale or retail.

The classification of eight (8) sub-sectors by division are as follows:

Division	Description
Food products	
10	Manufacture of food products
Beverages and tobacco products	
11	Manufacture of beverages
12	Manufacture of tobacco products

Division	Description
<i>Textiles, wearing apparel and leather products</i>	
13	<i>Manufacture of textiles</i>
14	<i>Manufacture of wearing apparel</i>
15	<i>Manufacture of leather and related products</i>
<i>Wood products, furniture, paper products and printing</i>	
16	<i>Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials</i>
17	<i>Manufacture of paper and paper products</i>
18	<i>Printing and reproduction of recorded media</i>
31	<i>Manufacture of furniture</i>
<i>Petroleum, chemical, rubber and plastic products</i>	
19	<i>Manufacture of coke and refined petroleum products</i>
20	<i>Manufacture of chemicals and chemical products</i>
21	<i>Manufacture of basic pharmaceutical, medicinal chemical and botanical products</i>
22	<i>Manufacture of rubber and plastics products</i>
<i>Non-metallic mineral products, basic metal & fabricated metal products</i>	
23	<i>Manufacture of other non-metallic mineral products</i>
24	<i>Manufacture of basic metals</i>
25	<i>Manufacture of fabricated metal products, except machinery and equipment</i>
<i>Electrical, electronic and optical products</i>	
26	<i>Manufacture of computer, electronics and optical products</i>
27	<i>Manufacture of electrical equipment</i>
28	<i>Manufacture of machinery and equipment n.e.c.</i>
<i>Transport equipment, other manufacturing and repair</i>	
29	<i>Manufacture of motor vehicles, trailers and semi-trailers</i>
30	<i>Manufacture of other transport equipment</i>
32	<i>Other manufacturing</i>
33	<i>Repair and installation of machinery and equipment</i>

6.4 Construction

New construction, alteration, repair and demolition. The installation of any machinery or equipment installed which is built-in at the time of the original construction is included, as well as installation of machinery or equipment after the original construction but which requires structural alteration in order install.

6.5 Services

Services related to Electricity, gas, steam & air conditioning supply; Water supply, sewerage, waste management & remediation activities, Wholesale & retail trade; Transportation & storage; Information & communication; Accommodation; Food & beverage; Finance; Real estate; Professional, scientific & technical; Administrative & support services; Private education; Private health & social work; Art, entertainment & recreation and Personal services & other activities.

6.5.1 Electricity, gas, steam & air conditioning are defined as an activity of providing electric power, natural gas, steam, hot water and the like through a permanent infrastructure (network) of lines, mains and pipes. The dimensions of the network is not decisive; also included are the distribution of electricity, gas, steam, hot water and the like in industrial parks or residential buildings. This section therefore includes the operation of electric gas utilities, which generate, control and distribute electric power or gas. Also included is the provision of steam & air-conditioning supply;

6.5.2 Water supply; sewerage, waste management & remediation activities comprised of activities related to waste management includes collection, treatment & disposal such as scheduled waste, solid waste and waste water from industrial and household, including recovery materials & contaminated sites. The waste from the treatment process can be disposed of or used as input for other production process. Related activities in water treatment and supply are also included in this sector;

6.5.3 Wholesale & retail trade encompasses of wholesale and retail trades, sales and repair of motor vehicles & motorcycles;

- 6.5.4 Transportation & storage** includes all establishments provided land transport, freight transport by road, other land transport, water transport, warehousing & supporting activities such as storage & warehousing, terminal operations, car parking services, highway operations, port operations, cargo handling/stevedoring, shipping agencies & forwarding of eight and other supporting activities for transportation services;
- 6.5.5 Information & communication** comprises activities of publishing, motion picture, video & television programme production, sound recording & music publishing, programming & broadcasting, telecommunication services, computer programming, consultancy & related activities and information services;
- 6.5.6 Accommodation services** refer to the provision on a fee of short-term lodging, whether open to the general public or restricted to members of a particular organisation. It excludes rental of long term furnished accommodation which is classified in Real Estate;
- 6.5.7 Food & beverages services** include food and beverage serving activities providing complete meals or drinks fit for immediate consumption, whether in traditional restaurants, self-service or take-away restaurants, whether as permanent or temporary stands with or without seating;
- 6.5.8 Financial services** include monetary intermediation activities; other financial service activities and activities auxiliary to financial services; insurance/ takaful, reinsurance/ retakaful and pension & provident funding activities; and activities auxiliary to insurance/ takaful and pension funding;
- 6.5.9 Real estate services** include acting as lessors, agents and/or brokers in one or more of the following: selling or buying real estate, renting real estate, providing other real estate services such as appraising real estate, property management or acting as real estate escrow agents. Activities in this division may be carried out on own or leased property and may be done on a fee or contract basis. Also included is the building of structures, combined with maintaining ownership of leasing of such structures;

- 6.5.10 Professional, scientific & technical** includes specialised professional, scientific & technical activities which require a high degree of expertise and training, and specialised knowledge and skills available to users. Activities performed include legal & accounting activities, activities of head offices, management consultancy activities, architecture & engineering activities, technical testing & analysis, scientific research & development, advertising & market research, other professional, scientific & technical activities and veterinary activities;
- 6.5.11 Administrative & support services** includes a variety of activities that support general business operations, including rental & leasing activities, employment activities, travel agency, tour operator & other reservation service activities, security & investigation activities, services to buildings and landscape activities & office administrative, office support & other business support activities;
- 6.5.12 Private educational services** refer to establishments registered with the Ministry of Education, Malaysia and the Ministry of Higher Education that provides academic, pre-primary & primary education, secondary education, higher education, other education and educational support activities;
- 6.5.13 Private health & social work services** include hospital services, medical & dental practice activities, other human health activities, residential care activities and social work activities without accommodation;
- 6.5.14 Arts, entertainment & recreation services** include a wide range of activities to meet varied cultural, entertainment & recreational interests of the general public, including live performances, operation of museum sites, gambling, sport and recreation activities;
- 6.5.15 Personal services & other activities** includes activities of membership organisations, activities of business, employers and professional membership organisations, activities of trade unions, activities of others membership organisations, repair of computers and personal & household goods and other personal services activities such as washing and dry-cleaning of textiles and fur products; hairdressing and other beauty treatment and funeral and other services activities.

7. ICT DEFINITION

Based on Organisation for Economic Co-operation and Development (OECD) 2015 definition:

a) Computer

*Computer includes personal computer, portable computer (e.g. laptop), tablet and other devices such as *smartphone.*

b) Intranet

Refers to the internal communications network using internet protocols and allowing communication within the organisation.

c) Extranet

Refers to a closed network that uses internet protocols to secure the sharing of business information with suppliers, vendors, customers or other business partners. It also can be part of a personal website business, where business partners can navigate after being confirmed in the login page.

d) Local area network (LAN)

A network connecting computers and associated devices within a localised area such as a single building, department or site; it may be wireless.

e) Wireless local area network (WLAN)

Local area network using high frequency radio waves instead of wires to communicate between networks-enabled devices. WLAN allows users to move around a small area within a radius of 20 to 91 meters.

f) Wide area network (WAN)

A network that connects computers and associated devices within a wide geographic area, such as a region or country.

Note:

** Malaysia including smartphone*

g) Fixed broadband

Refers to a technology with a speed of at least 256 kbit/s in one or both directions. It consists of wired fixed broadband and fixed wireless broadband.

Wired fixed broadband internet access most commonly used to send/ receive information via cable/ fiber optic (ADSL, SDSL, VDSL), fiber optic technology/ cable technology.

h) Mobile broadband

Refers to technology at speeds of not less than 256 kbit/s in one or both directions. It covers technologies such as 3G/ LTE/ 4G, 5G, UMTS, CDMA2000 and future technologies including both standard and dedicated data subscriptions. Typically used by mobile devices (e.g. laptops, tablets, USB wireless modems, smart phones and other mobile device.

Mobile broadband connection to the internet refers to access via WIFI hotspot (tethering) and not through a router (e.g. USB dongle/ modem/ surfstick such as YES dongle etc.).

i) Website

A website is a collection of network-related web resources such as a website, multimedia content that is usually identified by a common domain name and published by at least one web server. Websites can be accessed through public Internet Protocol (IP) networks such as the Internet or private local area network (LAN) by the URL that identifies the site. A website can be a personal website, a corporate website for a company, a government website, an organisation website and so on.

j) Social media

Refers to those who have a user profile, account or user license depending on the needs and types of social media. Types of social media are social networks (e.g. Facebook, Instagram and TikTok), enterprise blogs or enterprise microblogs (e.g. X) and multimedia content sharing websites (e.g. YouTube).

k) **Mobile internet and technologies**

Refers to an inevitable product in the development of the PC internet. It combines mobile and internet communications into one. This is a general term for activities where technology, platforms, business models and internet applications are combined with mobile communication technology (e.g. mobile IT equipment, Global Positioning System (GPS) equipment, wireless debit/ credit card payment terminals).

l) **Cloud computing**

Cloud computing refers to ICT services used over the internet to access software, computing power, storage capacity, etc. (e.g. HUAWEI Cloud Server, AVM Cloud).

m) **Data analytic**

Data analytic is a process or effort to process data into new information so that the characteristics of the data become easier to understand and useful for solving problems, especially those related to research (e.g. Tableau, Big Data Analytics, Mobile Business Intelligence).

n) **Management software**

Management software is application software that helps users while performing management activities (e.g. Enterprise Resource Planning, etc.).

o) **Collaborative online platforms**

Refers to economic partnerships (e.g. Lazada, Shopee, Grab, etc.).

8. **E-COMMERCE DEFINITIONS**

Based on OECD, 2015, e-commerce transaction is defined as sale or purchase of goods or services, through a network of computers that have been designed for this purpose. E-commerce transactions can occur between enterprises, households, individuals, governments and public or private organisation to another.

Goods or services that have been ordered through e-commerce methods, but the payment or receipt of goods or services can be received either through online or offline.

E-commerce transaction, includes orders placed on websites, extranet or Electronic Data Interchange (EDI). However, the transactions made by telephone, fax, e-mail (mail that is typed manually) and the similar transactions are not categorised as e-commerce transactions.

a) E-commerce income means the total income of establishments with e-commerce transactions. Income for wholesale and retail trade establishments refers to the value of sales of goods and services. Sales value means the value of all items for which ownership or effective right to use with a view to ultimate purchase, has been transferred to others.

b) E-commerce expenditure means the amount of expenses for establishments that have e-commerce transactions.

c) E-commerce by type of market

(i) **Domestic** means e-commerce transactions sales/ purchase that conducted in Malaysia.

(ii) **International** means e-commerce transactions sales/ purchase that conducted which involves international transaction.

d) E-commerce by type of customers

i) Other business

Business to Business (B2B) is related to e-commerce transaction between businesses which sell/ buy products or services to/ from another business. For example, a manufacturer can sell to a wholesaler or a wholesaler can sell to a retailer.

ii) Individual consumers

Business to Consumer (B2C) is related to e-commerce transaction between businesses and consumers which sell/ buy products or services. For example, business sells garment to consumer (income) or business provide discount coupon to consumers through e-commerce platform (expenditure).

iii) Government and other non-business organisations

Business to Government (B2G) is a business model that refers to businesses selling/ paying for products, services or information governments or government agencies. B2G networks or models provide a way for businesses to bid on government projects or products that governments might purchase or need for their organisations. This can encompass public sector organisations that propose the bids. B2G activities are increasingly being conducted via the internet through real-time bidding. B2G is also referred to as public sector marketing.

9. USAGE OF ICT PERCENTAGE CALCULATION

a) Usage of Computer, Internet and Web Presence

(i) Percentage of computer usage

$$= \frac{\text{Number of establishment used computer}}{\text{Number of establishment operating}} \times 100$$

(ii) Percentage of internet usage

$$= \frac{\text{Number of establishment used internet}}{\text{Number of establishment operating}} \times 100$$

(iii) Percentage of business having web presence

$$= \frac{\text{Number of establishment having web presence}}{\text{Number of establishment operating}} \times 100$$

b) Type of Web Presence Owned

(i) Percentage of owned website

$$= \frac{\text{Number of establishment with owned website}}{\text{Number of establishment operating having web presence}} \times 100$$

(ii) Percentage of presence on another entity's website

$$= \frac{\text{Number of establishment with web presence on another entity's website}}{\text{Number of establishment operating having web presence}} \times 100$$

(iii) Percentage of social media

$$= \frac{\text{Number of establishment with social media}}{\text{Number of establishment operating having web presence}} \times 100$$

(iv) *Percentage of e-marketplace*

$$= \frac{\text{Number of establishment with e – marketplace}}{\text{Number of establishment operating having web presence}} \times 100$$

c) Type of Computer Network Infrastructure Used

(i) *Percentage of intranet*

$$= \frac{\text{Number of establishment owned intranet}}{\text{Number of establishment operating using internet}} \times 100$$

(ii) *Percentage of extranet*

$$= \frac{\text{Number of establishment owned extranet}}{\text{Number of establishment operating using internet}} \times 100$$

(iii) *Percentage of local area network (LAN)*

$$= \frac{\text{Number of establishment owned LAN}}{\text{Number of establishment operating using internet}} \times 100$$

(iv) *Percentage of wireless local area network (WLAN)*

$$= \frac{\text{Number of establishment owned WLAN}}{\text{Number of establishment operating using internet}} \times 100$$

(v) *Percentage of wide area network (WAN)*

$$= \frac{\text{Number of establishment owned WAN}}{\text{Number of establishment operating using internet}} \times 100$$

(vi) *Percentage of other area network*

$$= \frac{\text{Number of establishment owned other infrastructure network}}{\text{Number of establishment operating using internet}} \times 100$$

d) Type of Internet Access

(i) *Percentage of fixed broadband usage*

$$= \frac{\text{Number of establishment owned fixed broadband}}{\text{Number of establishment operating using internet}} \times 100$$

(ii) *Percentage of mobile broadband usage*

$$= \frac{\text{Number of establishment owned mobile broadband}}{\text{Number of establishment operating using internet}} \times 100$$

(iii) Percentage of both types of broadband usage

$$= \frac{\text{Number of establishment owned both types of broadband}}{\text{Number of establishment operating using internet}} \times 100$$

e) Purpose of Internet Usage

(i) Percentage of sending or receiving email

$$= \frac{\text{Number of establishment used for sending or receiving email}}{\text{Number of establishment operating using internet}} \times 100$$

(ii) Percentage of telephoning over the internet usage

$$= \frac{\text{Number of establishment used telephoning over the internet}}{\text{Number of establishment operating using internet}} \times 100$$

(iii) Percentage of posting information or instant messaging

$$= \frac{\text{Number of establishment posting information or instant messaging}}{\text{Number of establishment operating using internet}} \times 100$$

(iv) Percentage of getting information about goods or services

$$= \frac{\text{Number of establishment getting information about goods or services}}{\text{Number of establishment operating using internet}} \times 100$$

(v) Percentage of getting information from government organisations

$$= \frac{\text{Number of establishment getting information from gov. organisations}}{\text{Number of establishment operating using internet}} \times 100$$

(vi) Percentage of interacting with government organisations usage

$$= \frac{\text{Number of establishment interacting with government organisations}}{\text{Number of establishment operating using internet}} \times 100$$

(vii) Percentage of internet banking usage

$$= \frac{\text{Number of establishment used internet banking}}{\text{Number of establishment operating using internet}} \times 100$$

(viii) Percentage of accessing other financial services

$$= \frac{\text{Number of establishment accessing other financial services}}{\text{Number of establishment operating using internet}} \times 100$$

(ix) Percentage of providing customer service

$$= \frac{\text{Number of establishment providing customer service}}{\text{Number of establishment operating using internet}} \times 100$$

(x) Percentage of delivering products online

$$= \frac{\text{Number of establishment delivering product online}}{\text{Number of establishment operating using internet}} \times 100$$

(xi) Percentage of internal or external recruitment

$$= \frac{\text{Number of establishment used internal or external recruitment}}{\text{Number of establishment operating using internet}} \times 100$$

(xii) Percentage of staff training usage (e-learning applications)

$$= \frac{\text{Number of establishment used for staff (e – learning)}}{\text{Number of establishment operating using internet}} \times 100$$

(xiii) Percentage of internet usage for others

$$= \frac{\text{Number of establishment used for others}}{\text{Number of establishment operating using internet}} \times 100$$

f) Usage of Digital Technology

(i) Percentage of website usage

$$= \frac{\text{Number of establishment used for website}}{\text{Number of establishment operating using internet}} \times 100$$

(ii) Percentage of social media usage

$$= \frac{\text{Number of establishment used for social media}}{\text{Number of establishment operating using internet}} \times 100$$

(iii) Percentage of mobile internet and technologies usage

$$= \frac{\text{Number of establishment used for mobile internet and technologies}}{\text{Number of establishment operating using internet}} \times 100$$

(iv) Percentage of cloud computing usage

$$= \frac{\text{Number of establishment used for cloud computing}}{\text{Number of establishment operating using internet}} \times 100$$

(v) *Percentage of data analytics usage*

$$= \frac{\text{Number of establishment used for data analytics}}{\text{Number of establishment operating using internet}} \times 100$$

(vi) *Percentage of managements software usage*

$$= \frac{\text{Number of establishment used for management software}}{\text{Number of establishment operating using internet}} \times 100$$

(vii) *Percentage of online collaborative platforms usage*

$$= \frac{\text{Number of establishment used for online collaborative platforms}}{\text{Number of establishment operating using internet}} \times 100$$

(viii) *Percentage of digital technology usage for other purposes*

$$= \frac{\text{Number of establishment used for other purposes}}{\text{Number of establishment operating using internet}} \times 100$$

(ix) *Percentage of not using digital technologies*

$$= \frac{\text{Number of establishment not using digital technologies}}{\text{Number of establishment operating using internet}} \times 100$$

10. SURVEY YEAR

Survey year refers to the year in which a survey was conducted.

11. REFERENCE YEAR

The reference year of the survey was the calendar year 2023. Establishments whose accounting year differed from calendar year were requested to report according to the accounting year or financial year covering the major part of the reference period.

12. METHOD OF DATA COLLECTION

This survey generally conducted through three (3) methods, namely;

a) ***Data collection method via Online method through the e-survey portal***

This method targets respondents who have used this method for previous routine surveys.

b) **Data collection method via e-mail, post, fax and telephone**

This method targets respondents who have used this method for previous routine surveys. Respondents were given a period of one (1) month to complete and return the questionnaire to DOSM.

c) **Face-to-face data collection method**

Field work operation is carried out to get feedback from establishments that have not yet given answers from the two (2) methods above and this method also targets establishments that have never been involved in a routine DOSM survey.

13. REPORTING UNIT

The reporting unit used in the survey was establishment. An establishment is defined as “an economic unit that engaged in one activity, under a single legal entity and operating in a single physical location”. Each establishment was assigned an industry classification based on its principal activity.

Each branch of a multi-branch organisation at a different location was conceptually treated as a different establishment. The establishment was requested to give separate returns for each activity in terms of value. However, if in practice, the accounts were centrally kept such that it was not possible to obtain separate data for each individual unit or branch, that entity or enterprise was treated as a single reporting unit and allowed to submit a consolidated questionnaire covering all units or branches.

14. SAMPLING DESIGN

Sampling design of the survey is a one-stage stratified random sampling. Categories of industries at two (2) digit MSIC at national level have been classified as stratum and the establishment as the sampling unit.

Each stratum (industry) has been set up to four substrata to ensure the distributed sample takes into account the economic characteristics of the industry. The main substratum is heterogeneous, was fully covered. Whereas, other substratum that are homogeneous were sampled.

Main substratum include large establishments that have a significant total revenue in the Industry while for the second to fourth substratum are based on micro, small and medium enterprise (MSME) categories.

15. SAMPLE SIZE

The main statistics used to estimate the sample size is the total revenue. The formula used in the estimation of the sample size for a stratum is as follows:

$$n = \frac{(\sum N_i S_i)^2}{V + \sum N_i S_i^2}$$

where;

n = Sample size

N_i = Population size for stratum i

S_i = Variance for stratum i

V = Desired variance

$$V = RSE^2 \cdot \left(\frac{\hat{Y}_i}{Z} \right)^2$$

where;

$\hat{Y}_i$ = Estimated total revenue for stratum i

RSE = Relative standard error

Z = Value of confidence level

Sample is distributed to substratum of the industry using Neyman Allocation method as follows:

$$n_{hi} = \left(\frac{N_h S_h}{\sum N_h S_h} \right) n'_i$$

$$h = 2, 3, \text{ dan } 4, \quad i = 1, 2, \dots k$$

where;

n_{hi}	=	Sample size for substratum h of stratum i
N_h	=	Population size for stratum h
S_h	=	Standard deviation for substratum h
n_i	=	Sample size for stratum i
h	=	substratum
i	=	Stratum

The sample size for this survey is 15,000 establishments. Establishments of the large categories were fully covered while establishments of the second to fourth substratum were randomly selected using systematic random sampling.

16. WEIGHTS

Weighted analysis is done using sampling weight to ensure that the selected sample can reflect population survey. The weights required are the sampling design weight and non-response weight.

The sampling design weight for the establishment at stratum h is as follows :

$$W_h = \frac{N_h}{n_h}, n = 1, \dots, 4$$

where;

N_h	=	Total population of substratum h; and
n_h	=	Total sample of substratum h

Non response weight at substratum h as below:

$$NRH_h = \frac{1}{n'_h/n_h}, h = 1, \dots, 4$$

where;

n'_h	=	Sampling design weight at substratum h
n_h	=	Non response weight at substratum h

The method of calculating the sampling design weight after the survey (adjusted weight) on substratum h as below:

$$W'_h = W_h \times NRW_h, h = 1, \dots, 4$$

where;

W_h = Sampling design weight at substratum h

NRW_h = Non response weight at substratum h

17. PUBLICATION AND DATA REVISION

The publication presents the revision of the estimation e-commerce income for the year 2023 until First Quarter 2025. The revisions were based on the latest data of annual surveys and account of company for the year 2023. For the latest year 2022 until First Quarter 2025, estimation was based on the quarterly data sources.

18. ROUNDING

The sum of the component figures may not tally with the sub-total or total figures due to rounding.

19. SYMBOLS AND ABBREVIATIONS

-	:	Nil
&	:	and
%	:	per cent
b	:	billion
etc.	:	et cetera
e.g.	:	example
RM	:	Ringgit Malaysia
ISIC	:	International Standard Industrial Classification
MSIC	:	Malaysian Standard Industrial Classification
n.e.c.	:	not elsewhere classified

Ver. : *Version*
W.P. : *Federal Territory*
Q : *Quarter*
QoQ : *Percentage change quarter-on-quarter*
YoY : *Percentage change year-on-year*

E) ICT USE AND ACCESS BY INDIVIDUALS AND HOUSEHOLDS SURVEY (ICTHS)

1. INTRODUCTION

The statistics released in this report are findings of the ICT Use and Access by Individuals and Households Survey (ICTHS) 2024. It provides data at national, state and administrative district levels. The guidelines, concepts and definitions used in this publication are based on the Manual for Measuring ICT Access and Use by Households and Individuals, 2020 Edition published by the International Telecommunication Union (ITU).

ICTHS was carried out starting reference year 2013, followed by 2015 and 2017. Since 2018, this survey is conducted annually. These technical notes will facilitate users with better understanding pertaining to the published statistics.

2. OBJECTIVES

The main objectives are as follows:

- i. To collect the latest and specific information on ICT use and access by individuals and households (HH);*
- ii. To serve as an input in the compilation of ICT Satellite Account (ICTSA);*
- iii. To serve as input in ICT Development Index (IDI) and Telecommunication Infrastructure Index (TII); and*
- iv. The ICT indicators obtained can assist the government in the development of the country's ICT sector and the generation of the Digital Economy.*

3. METHOD OF DATA COLLECTION

- 3.1 ICTHS uses the personal interview method using the questionnaire form to obtain information from respondents. During the survey period, trained interviewers visit households (HH) in selected living quarters (LQs) to collect demographic information on all household members and detailed information on the use and access of ICT equipment and services.*
- 3.2 Quality checks were done by experienced officers from the DOSM State office to detect and correct any possibility of errors or omissions at the time when the survey is conducted. The review processes were also implemented for selected HH to ensure the quality of the data collected.*

4. REFERENCE PERIOD

ICTHS 2024 was conducted for two months from November to December 2024. The reference period for ICT use by individuals was for the last three months prior to the interview. Example, if the survey month is in November 2024, then the reference period for individuals is calculated from 1st August 2024 until 31th October 2024.

5. SCOPE AND COVERAGE

- 5.1 The selection of the sample of this survey has taken into consideration both urban and rural areas in administrative district for all states in Malaysia.*
- 5.2 The coverage of the survey is households living in private LQs only and excluding those who are living in residential institutions such as hostels, hotels, hospitals, old folk's homes, military barracks and police, prisons, welfare homes and other institutions.*
- 5.3 This survey involved individuals aged five years and above. However, to enable the comparison to be made with the previous survey, the analysis for the use of ICT only involves individuals aged 15 years and above.*
- 5.4 This survey covered citizens and non-citizens in private residences in Malaysia during the survey period.*

6. SAMPLING FRAME

- 6.1 The sampling frame used for the selection of ICTHS 2024 sample are based on the Household Sampling Frame which is made up of enumeration blocks (EBs) created for the 2020 Population and Housing Census which was updated from time to time. EBs are geographical contiguous areas of land with identifiable boundaries created for survey operation purposes, which on average, contains about 80 to 120 LQs. All EBs are formed within gazette boundaries i.e. within administrative districts, sub-districts or local authority areas.*
- 6.2 The EBs in the sampling frame is classified by urban and rural areas. Urban areas are defined as in 2020 Population and Housing Census. Urban areas are gazetted areas with their adjoining built-up areas which had a combined population of 10,000 or more. Meanwhile, gazetted area with population less than 10,000 and not gazetted area are classified as rural area.*

- 6.3 *Built-up areas are the areas contiguous to a gazetted area and have at least 60 per cent of their population (aged 15 years and above) engaged in non-agricultural activities.*
- 6.4 *The definition of urban areas also takes into account the special development areas i.e. areas that are not gazetted and development can be identified and separated from the gazetted areas or built-up area of more than five kilometres and has a population of at least 10,000 people with 60 per cent of the population (aged 15 years and above) engaged in non-agricultural activities.*
- 6.5 *Urbanisation is a dynamic process and keeps changing with development and growth. Thus, the urban areas for 2010 and 2020 Population and Housing Censuses do not necessarily refer to the same areas, as areas fulfilling the above criteria of urban continue to expand and grow within the time.*
- 6.6 *The classification of areas by strata is as follows:*

Strata	Population of gazetted, built-up areas and special development area
<i>Metropolitan</i>	<i>75,000 and above</i>
<i>Urban large</i>	<i>10,000 to 74,999</i>
<i>Urban small</i>	<i>1,000 to 9,999</i>
<i>Rural</i>	<i>All other areas</i>

- 6.7 *For sampling purposes, classification of areas as stated in item 6.6 is used for all states and federal territories. For Sabah and Sarawak, due to inaccessibility, the rural strata had to be further stratified based on the time taken to reach the area from the nearest urban centre*
- 6.8 *For the purpose of tabulation, the strata reclassified were combined as follows:*
- Urban = Metropolitan + urban large*
- Rural = Urban small + all rural*

7. SAMPLE DESIGN

- 7.1 *The two-stage stratified sampling design was used in ICTHS 2024. The first level sampling unit were EBs, randomly selected using Probability Proportionate to Size Sampling.*

7.2 EBs were selected separately according to the following strata:

Primary strata	State
Secondary strata	Administrative district by state
Tertiary strata	Urban/ rural area by administrative district

7.3 Next, the second level sampling unit were LQs and sample for LQs were selected from the EBs by using Systematic Random Sampling method that generates random number and interval class to ensure every LQs have an equal probability to be selected as a sample. This procedure is performed systematically and scientifically to produce an unbiased sample and can represent the entire populations of HH in Malaysia.

8. SAMPLE SIZE

8.1 The sample of ICTHS 2024 represents the population of the analysis level. The sample size calculation has considered the following elements:

- Selected statistics from previous surveys;
- The level of sampling design;
- Desired error; and
- Respond rate

5.2 The distribution of sample size for ICTHS 2024 is as follows:

State	Number of selected EBs	Number of selected LQs
Johor	258	2,064
Kedah	316	2,528
Kelantan	282	2,256
Melaka	131	1,048
Negeri Sembilan	204	1,632
Pahang	271	2,168
Pulau Pinang	172	1,376
Perak	307	2,456
Perlis	73	584
Selangor	263	2,104
Terengganu	238	1,904
Sabah	437	3,392
Sarawak	442	3,536
W.P. Kuala Lumpur	60	480
W.P. Labuan	29	232
W.P. Putrajaya	25	200
MALAYSIA	3,508	27,960

9. DATA EVALUATION

9.1 Data obtained from probability sample survey are subject to two types of error i.e. sampling error and non-sampling error.

i. Sampling Error

Sampling error is a result of estimating data based on a probability sampling. This error can be measured by estimating the Relative Standard Error (RSE) and expressed as a percentage. It is used as an indicator of the precision of the estimated parameters studied. This estimate reflects the level of variation that was estimated through a survey variables compared with the population parameter.

For instance, in ICTHS 2024, the percentage of Internet access by household for Malaysia was 96.8 per cent with RSE of 0.1 per cent. In other words, the standard error (SE) is approximately 0.1 per cent. Based on a 95 per cent confidence level ($\alpha=0.05$), the percentage of Internet access by households was found to be in the range of 96.6% - 97.0%.

ii. Non-Sampling Error

These errors may arise through incomplete survey coverage, weaknesses in the frame, response errors, non-response errors and also errors during processing such as editing, coding and data capture. To ensure high quality data, several administrative procedures were taken to keep **non-sampling errors** to a minimum. Intensive training was conducted for the supervisors and enumerators. In addition, close supervision and random checks were carried out on households which were covered by the enumerators to ensure the validity of the information recorded.

In order to resolve the case of non-response error due to several reasons such as vacant house, no one at home, refusal to co-operate or not qualified LQ, the sample size estimation for ICTHS 2024 has taken into account all the possibilities. The survey frame is updated regularly to overcome the problem of non-response due to vacant home. Wide publicity was carried out through electronic and printed media to minimise the case of 'no one at home' and refusal to cooperate.

In addition, at the data processing stage, each variable's consistency checking and validation process has been systematically implemented in order to minimise the non-sampling error.

10. LIMITATIONS OF SURVEY

Several challenges and limitations occurred during the implementation of this survey. Among them are:

- i. This survey was conducted among selected households and individuals throughout Malaysia. However, it can also be used to provide an overview of ICT accessibility and usage.*
- ii. The coverage of this survey only covers the state level for strata 1 and 2 for urban areas, whereas for strata 3 to 6 for rural areas.*
- iii. A detailed analysis of ICT use and access by individuals and households by administrative district level is based on a relative value reliability of not more than 20 per cent tolerance interval.*
- iv. The findings of the survey should be used with high precaution and DOSM will not be responsible for any implications resulting from the use of these statistics.*

11. CONCEPTS AND DEFINITIONS

11.1 LIVING QUARTERS

*Living quarters are defined as **independent** and **separate** structures and are usually used as place of abode. The terms separate and independent mean the following:*

- i. **Separate:** A structure is considered separate if it is surrounded by walls, fence, etc. and is covered by roof.*
- ii. **Independent:** A structure is said to be independent if it has direct access via public path, communal passageway or space (that is occupants can come in or go out of their LQs without passing through others' premises).*

11.2 HOUSEHOLD

A person or group of people, whether related or unrelated who usually live together in a living quarter and make provisions (expenses) for food and necessities of life together.

11.3 HEAD OF HOUSEHOLD

Head of household is defined as any members whether male or female which is considered as head of HH by other members. The Head of HH must be an income recipient and is aged 15 years and above.

11.4 ICT ACCESS AND USAGE

11.4.1 ICT access by households: In order for a household to have access to ICT services or equipment, it should be able to be used during interview.

11.4.2 ICT use by individuals:

- Use of ICT equipment and services by one or more individuals in a household, either it was used in LQ or elsewhere;
- Individuals in a household aged 15 years and above; and
- Use of mobile phone, computer and Internet for the last three months.

11.4.3 Core ICT Indicators

i. Radio

A radio is defined as a device capable of receiving broadcast radio signals, using common frequencies, such as FM, AM, LW and SW. A radio may be a stand-alone device, or it may be integrated with another device, such as an alarm clock, an audio player, a mobile phone or a computer. It includes radio in a car.

$$= \frac{(\text{number of in-scope household with a radio})}{(\text{total number of in-scope households})} \times 100$$

ii. Television

A television (TV) is a device capable of receiving broadcast television signals, using popular access means such as over-the-air, cable and satellite. A television set is typically a stand alone device, but it may also be integrated with another device, such as a computer or a mobile phone.

$$= \frac{(\text{number of in-scope household with a television})}{(\text{total number of in-scope households})} \times 100$$

iii. Fixed-line telephone

A fixed telephone refers to a telephone line connecting a customer's terminal equipment (e.g. telephone set, facsimile machine) to the Public Switched Telephone Network (PSTN) and which has a dedicated port on a telephone exchange. This term is synonymous with the terms main station or Direct Exchange Line (DEL) that are commonly used in telecommunication documents. It may not be the same as an access line or a subscription.

$$= \frac{(\text{number of in-scope household with a fixed-line telephone})}{(\text{total number of in-scope households})} \times 100$$

iv. Mobile phone

A mobile phone refers to a portable telephone subscribing to a public mobile phone service using cellular technology, which provides access to the PSTN. This includes analogue and digital cellular systems and technologies such as IMT-2000 (3G) and IMT-Advanced. Users of both postpaid subscriptions and prepaid accounts are included.

$$= \frac{(\text{number of in-scope household with a mobile phone})}{(\text{total number of in-scope households})} \times 100$$

v. Computer

A computer refers to a desktop, a laptop (portable) computer or a tablet (or similar handheld computer). It does not include equipment with some embedded computing ability such as mobile phones, Personal Digital Assistant (PDA) or a TV set.

$$= \frac{(\text{number of in-scope household with a computer})}{(\text{total number of in-scope households})} \times 100$$

vi. Internet

The Internet is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files, irrespective of the device used (not assumed to be only via a computer, it may also be by mobile phone, tablet, PDA, games machine, digital TV and etc.). Internet can be accessed via a fixed or mobile network.

$$= \frac{(\text{number of in-scope household with a Internet})}{(\text{total number of in-scope households})} \times 100$$

vii. Internet Activities

Internet activities are categorised as follows:

a) Access to information

- Finding information about goods or services*
- Reading or downloading online newspaper or magazines, electronic books*

b) Communication

- Participating in social networks (e.g. Facebook, WhatsApp, Instagram, X etc.)*
- Sending or receiving e-mail*
- Telephoning over the Internet/ VoIP*
- Uploading self - created content to a website*
- Managing personal homepage*
- Blogging: Maintaining or adding contents to a blog*
- Accessing chat sites, blogs, newsgroups or online discussions*

c) Professional

- Looking for a job or submitting a job application*
- Participating in professional networks (e.g. LinkedIn and Xing)*
- Accessing office's computing system for the purpose of doing work from home*

d) Civic and Politics

- *Posting opinions or voting on civic or political issues (e.g. blogs, social networks, websites)*

e) Other Online Services

- *Performing tasks online to generate income*
- *Using services related to travel or travel-related accommodation*
- *Selling goods or services (via mudah.my, Facebook, WhatsApp etc.)*
- *Purchasing or ordering goods or services other than e-Commerce (via mudah.my, Facebook, WhatsApp etc.)*
- *Internet Banking*
- *Using software run over the Internet for editing text documents, spreadsheets or presentations*
- *Downloading software or applications*

f) Storage Space

- *Using storage space on the Internet to save documents, pictures, music, video or other files (e.g. Google Drive, Dropbox, Window Sky Drive, iCloud, Amazon Cloud Drive)*

g) Learning Activities

- *Doing a formal online course*
- *Consulting wikis (Wikipedia etc.), online encyclopedias or other websites for formal learning purposes*
- *Doing an informal online course/ assessment*

h) e-Health

- *Seeking health related information or services related information (e.g. on disease, injuries, nutrition etc.)*
- *Making an appointment with a health practitioner via a website*

i) e-Government

- *Getting information from government organisations*
- *Interacting with government organisations*

j) Entertainment

- *Listening to radio online*
- *Watching television online*
- *Downloading images, movies, videos or music; playing or downloading games*

k) e-Commerce

- *Purchasing or ordering goods or services (e-Commerce)*
- *Selling goods or services via e-commerce*

l) Safety, Online Protection and Awareness

- *Owning online security tools & adopt measures to ensure online protection*
- *Verifying the reliability of information found online*
- *Setting up effective measure (E.g: strong password, log-in attempt notifications) to protect devices and online accounts*
- *Changing privacy settings on devices, accounts or app to limit the sharing of personal data and information (E.g: name, contact information, photos)*
- *As an Internet user are you aware of the following cybercrimes: (E.g: spam, hacking, online, fraud stalking, phishing, cyber-bullying, catfish, fake news and spreading of computer virus)*

11.4.4 Selected Statistics of Malaysia from Malaysian Communications and Multimedia Commission (MCMC)

i. Broadband

The broadband penetration rate per 100 inhabitants is calculated by dividing the sum of fixed and mobile-broadband subscriptions by total number of population and multiplying by 100. Public Wi-Fi subscriptions are not taken into account.

ii. Mobile-cellular

The mobile-cellular penetration rate refers to the total subscriptions divided by total number of population and multiplied by 100. A penetration rate over 100 per cent can occur because of multiple subscriptions.

iii. Fixed-telephone

The fixed-telephone penetration rate refers to the total subscriptions divided by total number of population and multiplied by 100.

iv. Pay TV

The pay TV penetration rate per 100 households is calculated by dividing the number of household subscriptions by the number of households and multiplied by 100.

11.5 ROUNDING OF ESTIMATES

The calculation of certain categories may not always be the same between tables due to independent rounding. However, the differences were insignificant.

Percentages shown in the tables were computed from actual absolute figures and may not always add up exactly to 100 per cent due to rounding, although the totals were shown as 100 per cent.

11.6 NOTES AND SYMBOLS

W.P.	Wilayah Persekutuan
n.a.	Not applicable
ICT	Information and Communication Technology
-	Not available
0.0	Less than half the smallest unit shown. For example, less than 0.05 per cent.

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