Asia–Pacific Economic Statistics Week 2018
Closing the gaps in economic statistics for sustainable development
7-11 May 2018 | Bangkok, Thailand

Theme of APES 2018

Topic 2:

Use of modern technologies and new data sources for production and dissemination of economic statistics

Title:

ICT REVOLUTION: DEVELOPMENT OF ICT THROUGH SATELLITE ACCOUNT IN MALAYSIA

by:

Fadzilah Aini Mustaffa
Assistant Director

and

Yusrina Mohd Yusoff
Principal Assistant Director

National Accounts Statistics Division
Department of Statistics Malaysia (DOSM)

Asia-Pacific Economic Statistics Week
Seminar Component
Bangkok, 7 – 11 May 2018

Seminar Component

Name of author: Fadzilah Aini Mustaffa and Yusrina Mohd Yusoff[1]

Organization: Department Of Statistics, Malaysia

Contact address: National Accounts Statistics Division Level 3, Unit 01-05, Wisma Minlon,12th Miles, Sungai Besi Highway,43300 Seri Kembangan, Selangor, Malaysia

Contact phone: 03-8947 9092 and 03-8947 9100

Email: fadzilah.aini@stats.gov.my; yusrina@stats.gov.my

Title of paper:

ICT Revolution: Development of ICT through Satellite Account in Malaysia

Abstract

The aim of this paper is to share Malaysia's experiences in developing the Information and Communication Technology (ICT) through Satellite Account. The ICT revolution in the borderless world has sparked rapid competition and dissemination of information through the virtual world. This revolution has brought huge changes in many fields in the society and will affect a new form of human life patterns. The spreading and sharing of information around the world become easier with ICT technology. The importance of the ICT has driven the interest of economist and policy makers in measuring its significant to the economy. Based on Eleventh Malaysia Plan, the ICT industry and e-Commerce is expected to contribute 18.2 per cent or RM324.9 billion to Gross Domestic Product (GDP). Therefore, Department of Statistics, Malaysia (DOSM) took the initiative to develop Information and Communication Technology Satellite Account (ICTSA) since 2011. It was the second satellite account developed by DOSM after Tourism Satellite Account (TSA). The purpose of compiling ICTSA is to analyses in detail all aspects of supply and use of ICT industries and products. This paper focuses on elaboration the established framework of ICTSA in Malaysia and to present the latest findings results. The compilation of ICTSA is in accordance with System of National Accounts (SNA) 1993 and 2008, OECD Guide to Measuring the Information Society 2011 and Internet Economy Outlook 2012. The concepts and definitions are adapted to Malaysia's requirement.

(234 words)

Keywords: ICT, GDP, ICTSA, e-Commerce

[1] Fadzilah Aini Mustaffa is an Assistant Director and Yusrina Mohd Yusoff is a Principal Assistant Director in the National Accounts Statistics Division, Department of Statistics, Malaysia. Special thanks to Mdm. Shafizaermawaty Shafei for her fruitful contribution of this paper.

I. Contents

II. Introduction

The broad application of ICT nowadays has driven the borderless world to spark rapid competition and dissemination of information through the virtual world. This revolution has brought many changes in the society and has affected the pattern of human life. The spreading and sharing of information around the world become easier with ICT technology. The importance of the ICT has driven the interest of economist and policy makers to measure the significant of ICT to the economy. In line with this revolution, DOSM took the initiative to compile the holistic ICT Statistics through the framework of satellite account since 2011. ICTSA was the second Satellite Account developed by DOSM after the TSA. Therefore, ICTSA was developed based on experiences and knowledge obtains from compiling TSA.

ICTSA is a statistical framework which provides the detail transaction of supply and use of ICT products. The purpose of compiling this statistic is to present the contribution of ICT industry inclusive of e-Commerce to the Malaysia's economy. The compilation of ICTSA is made possible due to the well-established System of National Accounts (SNA) in Malaysia. The term satellite account is adapted to reflect the nature of the account development. It is a satellite to the core set of SNA that presents additional information which is beyond the available information provided in the SNA.

The developing of satellite accounts is closely linked to the main SNA but they do not change the underlying concepts of the SNA in a fundamental way as mention in SNA (2008). A great strength of the SNA is needed in developing satellite accounts.

Based on Eleventh Malaysia Plan 2016-2020, the share of ICT industry to GDP was targeted at 18.2 per cent or approximately RM324.9 billion by 2020. The real contribution of ICT to GDP

is obtainable and the linkages between goods and services of ICT within the industries are able to be distinguished by establishing the ICTSA.

III. Literature Review

Cited in the paper Hanna, N. K. (2011), the ICT revolution will have a profound impact on all aspects of growth, equity and governance for countries at all levels of development. Technical advances in many ICT areas continue apace and could level or change the playing field for developing countries, provided policy and institutional changes are made to capitalize on these advances.

Technology changes the way society functions. The dramatic advances in technology over recent decades have collaterally precipitated wide sweeping and profound change to the functioning of almost every form of human exchange, the world over (Carayannis, E. G., Campbell, D. F., & Rehman, S. S., 2015).

According to Australian Bureau of Statistics (ABS) (2006), ICT plays an important role in the way in which we live and do business. There is considerable interest in the role of ICT as a significant driver of socioeconomic development, for example, in the way that ICT has allowed businesses to increase productivity. For official statisticians, the measurement of these technologies provides significant conceptual and measurement challenges. A key part of the ABS response to these challenges has been the development of an ICT satellite account for Australia for 2002–03. This was preceded by the release in 2003 of a pilot ICT satellite account in respect of 1998–99.

Malaysia economy has started to shift from a resource-driven economy towards knowledge-based since the 1990s as mention in Eleventh Malaysia Plan 2016-2020. It will focus on ICT as an imperative enabler for a knowledge economy, especially in the areas of industry, infrastructure, human capital and digital inclusion. Various ICT initiatives have been implemented in the effort to transform the country into an innovative digital economy.

The Prime Minister of Malaysia, together with the founder and Executive Chairman of Alibaba Group, launched the world's first Digital Free Trade Zone (DFTZ) on 22nd March 2017. The purpose of DFTZ is to develop the digital economy and cross-border trading activity using the e-Commerce. DFTZ is expected to increase e-Commerce contribution to GDP by RM211 billion by 2020. DFTZ is an initiative to capitalize on the confluence and exponential growth of the internet economy and cross-border e-Commerce activities (Malaysia Digital Economy Corporation, 2017).

IV. The Establishment of ICT Satellite Accounts in Malaysia

Satellite Accounts are recommended as the main tool in analysing specific economic activities in line with the SNA frameworks. According to SNA 1993 "Satellite accounts or systems generally stress the need to expand the analytical capacity of national accounting for selected areas of social concern in a flexible manner, without over burdening or disrupting the central system". The compilation of statistic through Satellite Account has been developed by most of National Statistics Offices (NSO) according to their countries' needs. For example, ABS has produced Tourism Satellite Account, Information and Communication Technology Satellite Account and Non-Profit Institutions Satellite Account. In line with other developed NSO, DOSM has produced two Satellite Accounts' product that is TSA and ICTSA. DOSM also plans to extend the coverage of Satellite Accounts' in the future.

The initiative to develop ICTSA was documented under the DOSM Corporate Plan 2004-2009 and it was continued presented in Strategic Plan 2010-2014. To achieve the goal, DOSM was collaborated with other government agencies such as Ministry of Finance (MOF), Economic Planning Unit (EPU), Ministry of Communication & Multimedia Malaysia (KKMM) and Malaysia Digital Economy Corporation (MDEC) to set up an Inter-Agency Technical Working Group. All input requirement such as definitions, methodology and data sources are discussed in this committee.

The first ICTSA experimental report was published in December 2012. This publication was circulated among the committee members as well as with the stakeholders. After going through years of development, DOSM is seen successful in producing ICTSA. For the first attempt, DOSM released the ICTSA publication in November 2014 and it was officially shared to the public. Subsequently, the compilation of ICTSA was made by annual basis and the latest publication was ICTSA 2016.

V. Concepts, definitions and classifications

The satellite account is a systematic statistical measurement that applies concepts, definitions and classifications which are based on international standard to enable comparison among countries. The concepts of ICTSA are prepared based on the recommendation by SNA 1993 and 2008, United Nations meanwhile the definitions and classifications are adopted from the guidelines of ICT as stipulated in the OECD Guide to Measuring the Information Society 2011 and Internet Economy Outlook 2012. The concepts, definitions and classifications are adapted to Malaysia's requirement to reflect the ICT industry in Malaysia holistically.

a. Definition of ICT

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. Definition of e-Commerce

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.

c. Classification of ICT

The 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. ICT consists of industries such as manufacturing, trade, services and content & media industries. The classification of ICT products is based on Malaysian Classification of Products by Activity (MCPA) 2009 which conforms with Central Products Classification (CPC) Ver. 2.

VI. Methodology and Framework

ICTSA compilation was developed base on the framework of Supply and Use Tables (SUT).

The GDP of Malaysia was compiled by using the commodity flow method since 1949. DOSM has begun to use towards SUT framework since 2005. SUT are updated every five years based on the availability of comprehensive information from the Malaysia's economic census. However, the compilation of ICTSA 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 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 by households and government, products that have been capitalised, changes in inventories and exports.

The 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 or 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 other industries which produce ICT products.

Since SUT is updated every five years and the compilation of ICTSA will be produced annually, then the various data sources are needed. The data from annual survey related to ICT conducted by DOSM such as Survey of Services Establishment and Survey of Manufacturing Industries are used in compiling this statistics. This survey conducted by establishments approach.

The measurement of e-Commerce value added is based on the recommendations by Internet Economy Outlook 2012, OECD. There are two recommended approaches, which are narrow and broad. Narrow approach takes into account the value added of wholesale and retail sectors. While broad approach includes all industries across the economy. For Malaysia's case, the broad approach was applied in measuring the value added of e-Commerce. It is assume the share of revenue from e-Commerce in total revenue for each industry sector is proportional to the share of value added from e-Commerce in total value added for the same industry.

DOSM also introduced a new survey of ICT Use and Access by Individuals and Households (ICTHS) in 2013 to provide comprehensive information on the expenditure and income structure of ICT and e-Commerce. This survey conforms to the recommendations stated in the International Telecommunication Union manual and conducted once in two years. The latest ICTHS finding was released in March 2018.

The existing annual surveys and censuses were also enhanced to accommodate ICTSA compilation by incorporating ICT module that provides data on e-Commerce value by establishments and sectors. e-Commerce information is essential to measure the overall performance of Digital Economy in Malaysia. DOSM also conducted establishment survey on e-Commerce in 2015 to capture e-Commerce transactions by categories of Business to Consumer, Business to Business and Business to Government. The survey enables us to break down the e-Commerce value by categories, and identify the providers and users of e-Commerce services.

VII. Main Findings of ICTSA 2016

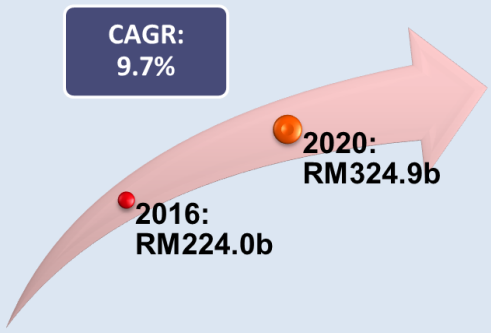
DOSM have released the ICTSA annually and the latest publication was ICTSA 2016, which was released in October 2017. The main findings of ICTSA 2016 as below:

a. Contribution of ICT

Contribution of ICT to the national economy registered a value of RM224.0 billion in 2016, recorded a growth of 8.7 per cent with a share of 18.2 per cent. Information and Communication Technology Gross Domestic Product (ICTGDP) accounted for 13.4 per cent (RM164.9 billion) and e-Commerce for non ICT industries 4.8 per cent (RM59.0 billion) as shown in **Exhibit 1**.

Exhibit 1: Contribution of ICT to economy

	2015	2016
ICTGDP	RM152.1 billion	RM164.9 billion
Share	13.1%	13.4%
e-Commerce (non ICT industry)	RM54.0 billion	RM59.0 billion
Share	4.7%	4.8%
ICT	RM206.1 billion	RM224.0 billion
YoY	9.6%	8.7%
Share to GDP	17.8%	18.2%



11th Malaysia Plan : Strategy Paper 15

Re-energising ICT Industry

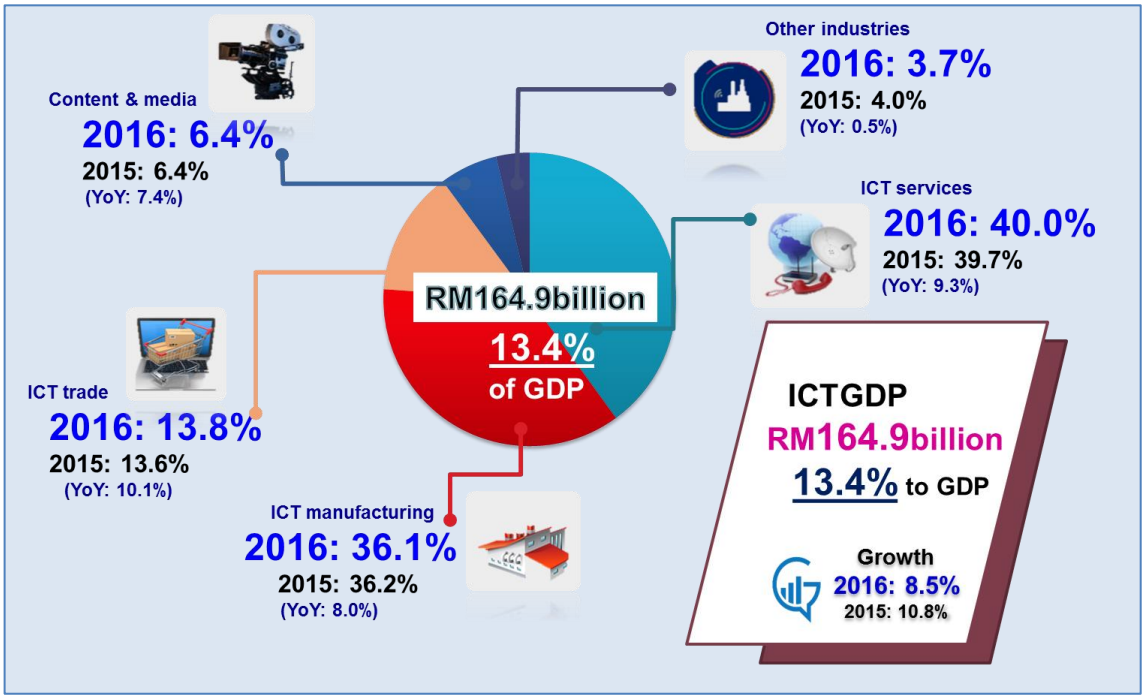
"..to achieve an 18.2% or approximately RM324.9 billion ICT contribution to GDP by the year 2020."

b. Performance of ICT Industry

In 2016, ICTGDP grew at 8.5 per cent as compared to 10.8 per cent in the previous year **(Exhibit 2)**. The growth was supported by ICT services which depicted 40.0 per cent and ICT manufacturing 36.1 per cent. For ICT services, it was supported by the telecommunications services meanwhile for the ICT manufacturing, it was driven

by electronic components & boards, communication equipment and consumer electronics.

Exhibit 2: Contribution ICTGDP by industry

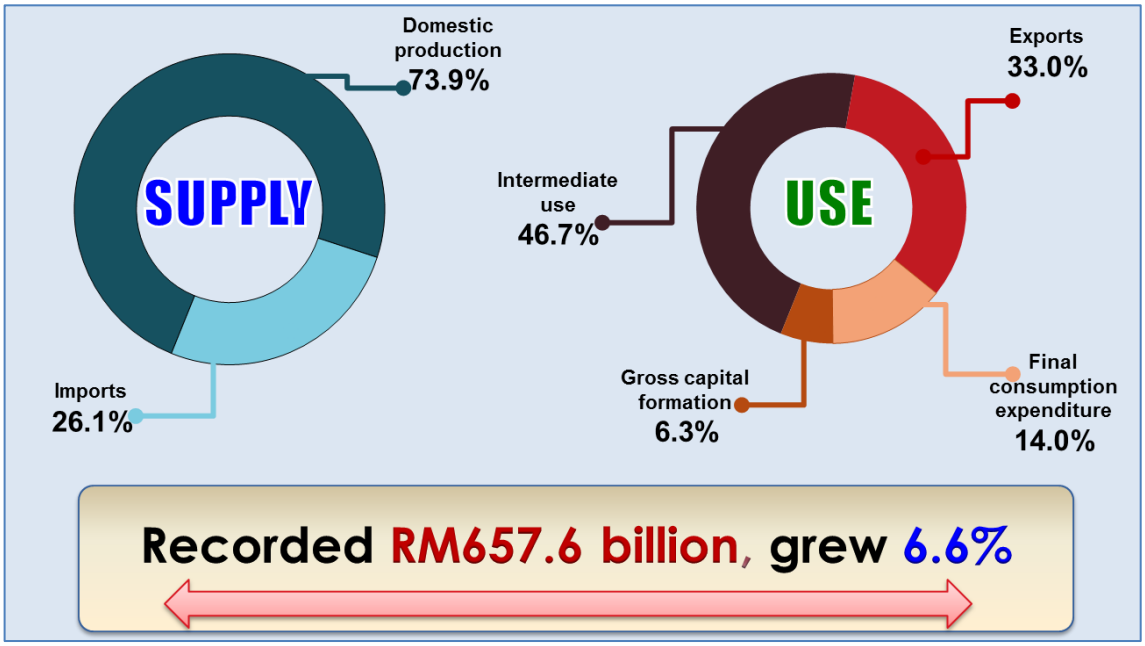


c. Supply and Use of ICT Products

Total supply and use of ICT products increased by 6.6 per cent to RM657.6 billion. Supply of ICT products was dominated by domestic production, 73.9 per cent while the remaining was imports 26.1 per cent. For use of ICT products, intermediate use recorded a share of 46.7 per cent and exports 33.0 per cent. Final consumption

expenditure and gross capital formation registered a share of 14.0 per cent and 6.3 per cent respectively **(Exhibit 3)**.

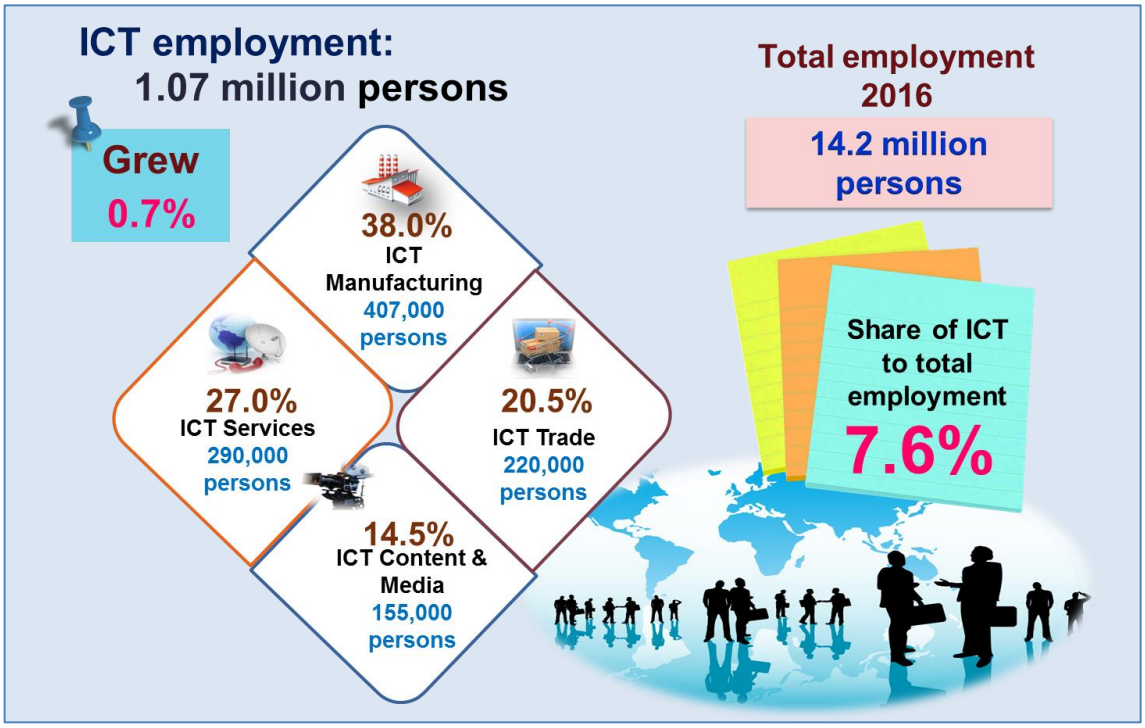
Exhibit 3: Supply and use of ICT products



d. Employment in the ICT Industry

Employment in the ICT industry registered a marginal growth of 0.7 per cent with 1.07 million persons employed in 2016. ICT manufacturing dominated 38.0 per cent, followed by ICT services (27.0%) and ICT trade (20.5%). ICT industry accounted for 7.6 per cent of total employment in Malaysia **(Exhibit 4)**.

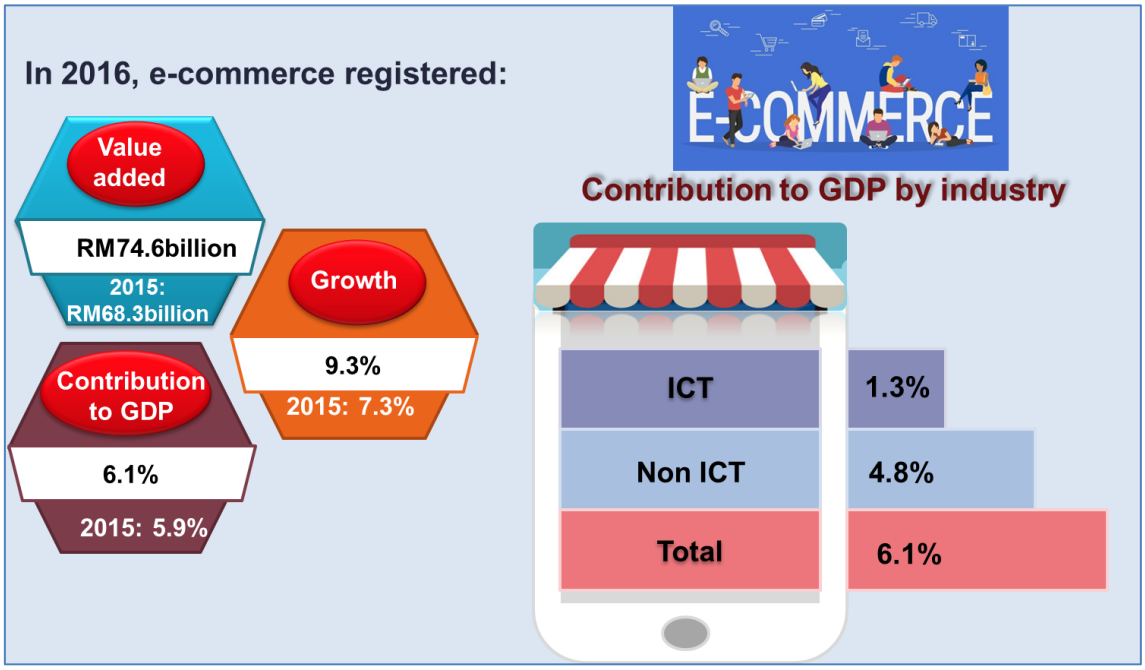
Exhibit 4: Number of employment in the ICT industry by industries



e. e-Commerce

In 2016, the value added of e-Commerce increased by RM6.3 billion to RM74.6 billion. Performance of e-Commerce rose to 9.3 per cent driven by non ICT industry. In terms of share to GDP, e-Commerce for non ICT industry contributed 4.8 per cent, while e-Commerce for ICT industry was 1.3 per cent **(Exhibit 5).**

Exhibit 5: Value added of e-Commerce



VIII. Challenges

The rapid development of ICT technology has led to a change in technology era to the digital economy. The Fourth Industrial Revolution (Industry 4.0) generated economic, social and developmental growth towards holistic digitalization. The big data revolution is a new innovation such as artificial intelligence, robotics, 3D printing and the Internet of Things (IoT).

The digital sharing economy activities such as dwelling services capture digital rental intermediaries, ride service and delivery services are also implementing in Malaysia.

There are challenges to identify the businesses involvement in the digital economy. Some of the digital economy identification is not available in business registration. As at now, only Wholesale and Retail Trade activity has an identifier as an online business in Companies Commission of Malaysia registration.

The momentum of ICT technology development is growing fast. The scope of the digital economy is still in the grey area and there are no standard manual, methodology or specific guidelines how to measure the digital economy. Thus the international comparable is difficult to be measured between countries.

IX. Conclusion

From the compilation of Gross Domestic Production, basically, the ICT contributions can be obtained from this statistics. However, the comprehensive information and overall performance of ICT can be gained through the satellite account compilation. Besides the ICT contribution, information regarding the supply and use of each ICT products, the value of exports and imports of ICT products, income components of ICT industries, employment related to ICT industries and the value of e-Commerce can be obtained from this compilation.

Satellite Account provides details and comprehensive information on the contribution of a specific economic activity which facilitates the policy makers, researchers, industry players and citizens to monitor, measure and formulating sound policies for the transformation digital

programmes. The compilation of ICTSA is important to measure the performance of Digital Economy in Malaysia.

DOSM reached another milestone in producing the ICTSA in the midst of the country's aspiration in achieving the high income nation. The experiences garnered by DOSM in developing ICTSA are beneficial to be shared and used as a reference to other counterparts that intends to produce ICTSA. The knowledge gained from this exercise will be useful in enhancing the existing concepts and methodology for ICTSA standard manuals and guidelines.

X. References

[1] Australian Bureau of Statistics (ABS) (2006), *ICT Satellite Account, ASNA Experimental Estimates*, Australia.

[2] Carayannis, E. G., Campbell, D. F., & Rehman, S. S. (2015). “Happy accidents”: Innovation-driven opportunities and perspectives for development in the knowledge economy. *Journal of Innovation and Entrepreneurship, 4*(1). doi:10.1186/s13731-015-0021-9

[3] Eleventh Malaysia Plan 2016-2020: Anchoring growth on people. *Driving ICT in the Knowledge Economy, Strategy Paper 15* (2015). Putrajaya, Malaysia: Economic Planning Unit, Prime Ministers Department.

[4] European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, World Bank, United Nations (1993), *System of National Accounts 1993*, United Nations, New York.

[5] European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, World Bank, United Nations (2009), *System of National Accounts 2008*, United Nations, New York.

[6] Hanna, N. K. (2011). Implications of the ICT Revolution. *Transforming Government and Building the Information Society: Challenges and Opportunities for the Developing World* (pp. 27-65). Retrieved from

http://www.springer.com/cda/content/document/cda_downloaddocument/9781441915054-c1.pdf?SGWID=0-0-45-879448-p173923431.

[7] Malaysia Digital Economy Corporation (MDEC) (2017), *Malaysia Launches World's First Digital Free Trade Zone. (n.d).* Retrieved March 16, 2018, from http://www.digitalmalaysia.my/news/malaysia-launches-worlds-first-digital-free-trade-zone

[8] OECD (2011). OECD Guide to Measuring the Information Society 2011, OECD Publishing. http://dx.doi.org/10.1787/10.1787/9789264113541-en

[9] OECD (2012). OECD Internet Economy Outlook 2012, OECD Publishing. http://dx.doi/org/10.1787/9789264086463-en