

AGE OF DISRUPTIVE TECHNOLOGY

ICT STRATEGIC REVIEW 2016/2017



PIKOM

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PIKOM, the National ICT Association of Malaysia, is a not-for-profit organisation. It is the largest association representing information and communications technology (ICT) players in Malaysia. Since its inception in 1986, PIKOM has come of age as the voice of the ICT industry. It has become an ICT referral centre for government and industry players, as well as international organisations. In this regard, PIKOM takes on the responsibility to publish ICT-relevant information in a periodic manner.

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Foreword By The Minister Of Communications And Multimedia

Y.B. Senator Datuk Seri Panglima Dr. Mohd Salleh Tun Said Keruak

The Ministry of Communications and Multimedia Malaysia is delighted to see that once again PIKOM has produced its signature ICT Strategic Review 2016/2017.

I understand this report is in its eighth edition and I take this opportunity to congratulate the National ICT Association of Malaysia for consistently producing thought-leadership publications that relevant to the progress of the ICT industry in Malaysia.

I am also very happy and excited to see that this year's theme is "Age of Disruptive Technology".

Disruptive Technology has been creating such a buzz in the world. And we have been hearing this phrase often: Disrupt or Be Disrupted.

As you know, in Malaysia, the Government is targeting the digital economy to contribute approximately 20% to the Gross Domestic Product (GDP) by 2020.

I believe we can achieve this target or even surpass it as the contribution of the digital economy reached 17.8% in 2015.

And we, the Ministry of Communications and Multimedia will play a key role in accelerating the digital economy for the development of the nation.

At the recent tabling of the Budget 2017, the Government allocated RM162 million to implement programmes such as the e-commerce ecosystem and Digital Maker Movement as well as the introduction of the Malaysia Digital Hub. The country will also see the first Digital Free Zone in the world,, which will merge physical an virtual zones, with additional online and digital services to facilitate international e-commerce and invigorate internet-based innovation.

As you know, the Government has made 2017, the Year of the Internet Economy.

These initiatives announced in Budget 2017 will help propel the Digital Economy agenda forward and we must all work hard together to achieve this objective.

Once again, I congratulate PIKOM for their efforts in producing this timely and informative report that discusses the subject of the Digital Economy at length which will surely improve the lives of all Malaysians.

Y.B. Senator Datuk Seri Panglima Dr. Mohd Salleh Tun Said Keruak



Message By PIKOM Chairman

Chin Chee Seong

Disruptive technologies and innovation have been the buzz words in the technology world for decades. The only difference between then and now is the scale and level of disruption; to the extent of driving some industries to obsolescence. It is certainly a 'game changer' for some businesses and economies!

It is with this in mind that PIKOM has decided to name the theme for this year's ICT Strategic Review 2016/2017: Age of Disruptive Technology. Following tradition, this will also be the theme for the PIKOM Leadership Summit (PLS) this year.

As this is an inaugural PIKOM ICT Strategic Review under my chairmanship, I am very excited to note that this is our 8th publication in the series. This annual strategic review has been the flagship of PIKOM and I am aware that over the years, our members including CIOs and C-level executives, industry players and government agencies have referenced them for the latest industry information, benchmarking and technology related trends. I am confident that the contents for this year's publication will be just as insightful and informative.

To publish such a report every year, however, it can be a challenging task to ensure that the contents are relevant

to our readers. This year, in line with the theme, we have for the first time introduced a number of new insights and they include the State of our Digital Economy (in addition to our traditional brick and mortar economy), an Internet-of-things review, a Big Data Analytics (BDA) landscape and the profile of 20 Malaysian start-ups, to name but a few. It is our hope that you will find the chapters in PIKOM's ICT Strategic Review 2016/2017 insightful, interesting and informative.

We also hope that it can serve as your reading supplement not only on the latest and fast moving industry trends, but also opportunities that may arise in line with your business goals.

I would like to thank the sponsors who have lent their company's name and logo for the publication and for supporting this year's report. On this note, I would also like to express my gratitude to the PIKOM Research Committee and the contributions from the writers, as the report would not have been possible without their tireless efforts.

Finally, I would like to record my appreciation to the Ministry of Communications and Multimedia Malaysia, particularly Y.B. Senator Datuk Seri Panglima Dr Mohd Salleh Tun Said Keruak for his support of PIKOM and its activities.



Executive Summary

Woon Tai Hai

PIKOM Research Committee Chair

What is the definition of a Disruptive Technology? One definition that appeared in Investopedia reads: *"A technology that significantly alters the way that businesses operate. A disruptive technology may force companies to alter ways that they approach their business, risk losing market share or risk becoming irrelevant..."*

The biggest and most common disruptive technology we see today is the smartphone which virtually rendered the traditional camera obsolete and totally changed the channel and style of communication; and the disruptive business model e-commerce which makes cross-border transactions a dream come true, of which without technology such as the internet would not be possible. Today we also hear other familiar terms such as market disruption and disruptive innovation.

At the CES 2016, five most disruptive innovations were cited and some of them are also known as the Big Bang Disruptors. They are the Autonomous vehicle, Providers become platform, Invisible but essential 5G infrastructure, Random experiments accidentally collide into products (defining feature of a big bang disruptor) and Uber-disruptor.

The McKinsey Global Institute report defines it as disruptive technologies that transform the way we live and conduct business. It also identifies and describes in detail 12 technologies that are 'game-changers'. They are mobile internet, automation of knowledge, the internet of things (IoT), Cloud, advance robotics, autonomous vehicles, next generation genomics, energy storage, 3-D printing, advanced materials, advanced oil and gas exploration/recovery and renewal energy. How many of these have we experienced in the current context? Perhaps only a handful!

There will be a continuing relentless parade of new technologies and each of them professes to be the breakthrough and the next big thing to come! In fact, the age of disruptive technology will perhaps create more confusion and distract from realising

the full benefits of the technology adopted.

However it is important that business and government leaders keep themselves abreast of all these disruptive technologies including the new ones that are coming in the near future. We foresee that this 'Age of Disruptive Technology' does not have a shelf-life in sight. While you may not necessarily rush in to adopt them, it is important that you are aware of the impact and implication should you or should you not adopt them!

Obviously there is no perfect answer to this and hence, realising that dilemma, PIKOM has decided to adopt this theme – Age of Disruptive Technology for this year's ICT Strategic Review publication; and selectively focus on several key technology disruptors to provide our readers with a better perspective and appreciation of these technologies and

platforms that are already in our midst. You may not find all the answers here but it will be a good start!

In line with the theme, this year's publication will be showcasing the following chapters:

Economic and ICT industry Outlook

In view of the economic uncertainties in Malaysia caused by internal and external factors, PIKOM is being conservative on the GDP forecast for 2016 and 2017 and have revised our earlier projections accordingly to 4.2% and 4.0% respectively. This chapter also talks about the state of the ICT industry in the country.

Dodging Digital Disruption

MDeC, which is now known as Malaysia Digital Economy Corporation discusses how organisations can avoid being disrupted.

Disruptive Technology to Spur Economic Growth

Fusionex looks at how organisations which have adopted this approach now hold the cutting edge when they compete against less data-reliant companies which are slower to react to changes in the market.

The BIG Deal

This chapter explores efforts to accelerate adoption of big data analytics across businesses and industries while also outlining

present opportunities in two regional markets and the world.

IOT: A Game Changer for the New Economy

MiMOS gives a comprehensive view of how the Internet of Things can reshape the living standards of a society and identifies the industries where IoT can generate economic value. At the same time, it highlights the need for greater awareness on the challenges of IoT, especially in terms of security, interoperability issues as well as data privacy and protection.

ASEAN Ecommerce: A Market Waiting to Shine

This chapter by ASOCIO looks at the factors driving growth, explores the developments of cross-border ecommerce and the challenges and issues that are constraining the region from becoming an e-commerce powerhouse.

First Look: The “Disruptive” Kids

This is the first time PIKOM is profiling a selected number of both young and established start-ups which have shared their growth journey with us.

Smart City: The New Frontier of Innovation

The Malaysian Communications and Multimedia Commission writes an interesting piece on booming growth of smart cities and the characteristics to make a smart city project successful.

Winning in this Age of Disruption

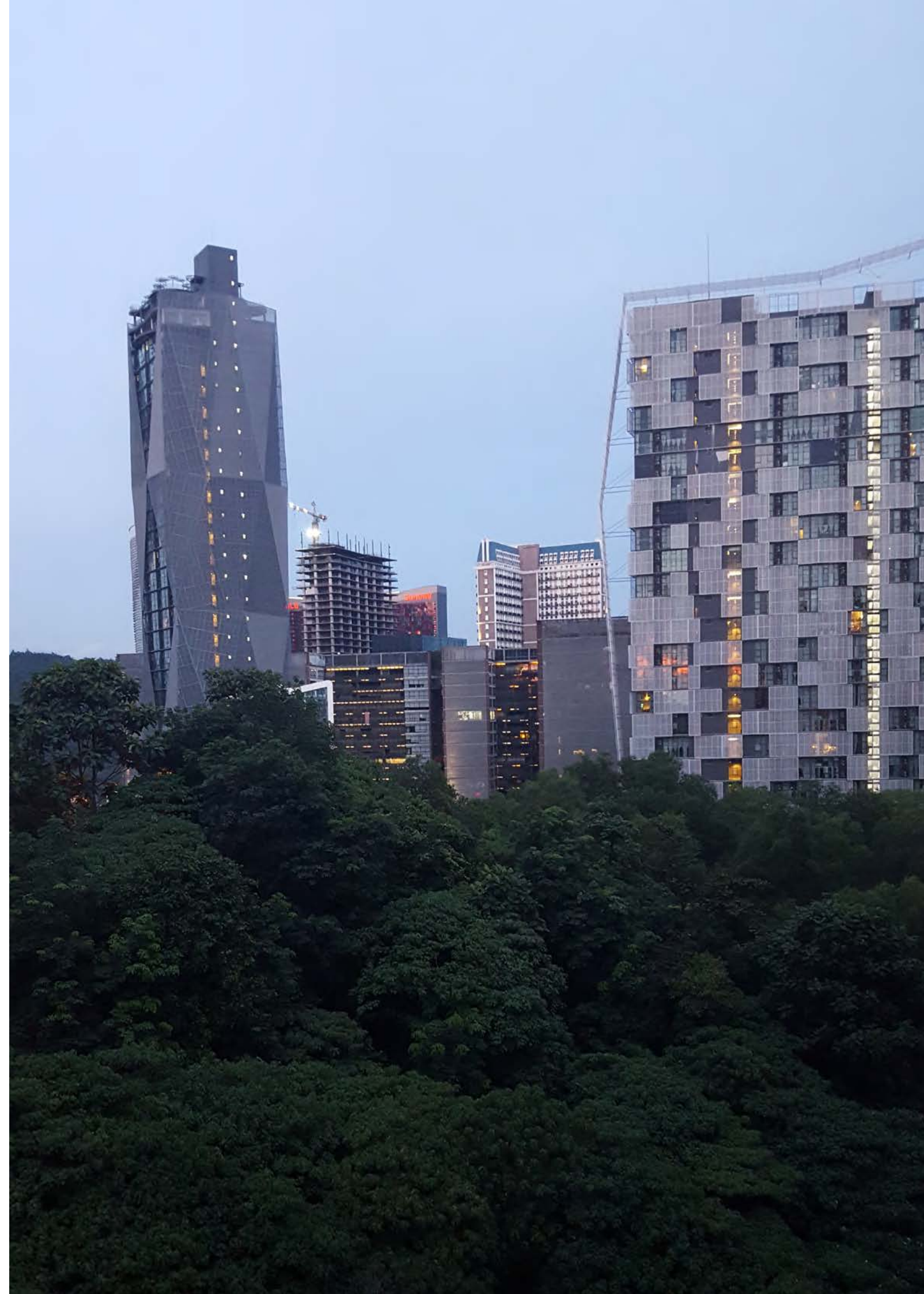
This chapter by Leaderonomics looks at the changing patterns of leadership. The author discusses the different kinds of collaborative leadership models which are causing a disruption in the corporate world.

Shifting Sands in the GBS Regional Scene

Malaysia ranks high when it comes to choosing a Global Business Service destination. Outsourcing Malaysia, a chapter of PIKOM, discusses the plus points of the country's appeal to investors and why it is important for the government and the GBS sector to be diligent in maintaining our pole position.

Leveraging on Disruptive Technology: The Malaysian Public Sector ICT Strategic Plan 2016-2020

In this chapter, the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) discusses how the Public Sector is rising to the challenge of disruptive technologies mainly towards a digital-based public service delivery system. MAMPU also explains the role of the Public Sector ICT Strategic Plan (PSISP) 2016-2020 in providing the strategic direction for the implementation of ICT in the public sector for the next five years.



1 Economic & ICT Industry Outlook

The National ICT Association of Malaysia (PIKOM)

This chapter provides a summary outlook on the Economy and the ICT industry. The information and references were sourced from various places including: Bank Negara Malaysia (BNM), Department of Statistics Malaysia (DOSM), Malaysian External Trade Development Corporation (MATRADE) and Ministry of International Trade and Industry (MITI) Weekly Bulletin.

Economic outlook

When we commenced writing on the Malaysia's economic outlook for 2016 and 2017, a number of significant events had just taken place. First one being our Prime Minister made his third trip to China on 31st October 2016, to foster and maintain greater social and business relationships with this fast growing economy. All eyes were on the potential investments to be secured and bilateral collaborations that are forthcoming; among them being the appointment of Jack Ma as advisor to the Digital Economy of Malaysia. Despite some skepticism at the outset, there seems to be much optimism in the business sectors.

Then, there were also the days leading up to the US Presidential Election on 9th November 2016 and the indications from pollsters and media that Hillary Clinton would be the 45th President of the USA. To the surprise of the whole world, Donald Trump dashed Clinton's hopes even before the count was completed and Trump instead was named the President-Elect with Clinton conceding defeat thereafter. What followed was a slump in stock markets around the world especially in Asia and weakening of currencies especially the Mexican Peso; and global gloom and doom were forecasted throughout the day. Interestingly all the markets recovered within the next day despite the continuing backlash on the election results. The reality remains, the 45th President has been elected and the transition process is in motion with a confirmed sworn-in date in the month of January next year.

However, the currency woes for Malaysia appeared to be only beginning. When trading commenced on 11th November 2016, the Ringgit started weakening

against the USD, Euro and all major trading currencies. From a low of 4.259 (on the close of the previous business day) against the Dollar, the Ringgit fell to 4.55 the next trading day and threatened to decline further within the morning session; prompting Bank Negara to curtail trading of the Ringgit. Local banks were only allowed to offer Dollars at Thursday's cheaper range and for specific corporate payments. This move certainly created jitters in the market place and sparked fears that the Ringgit, already weakened in the past months, would face huge sell down when the controls are lifted.

The crucial question now is what will be the outlook for the Ringgit in the coming months and years; but more importantly how will the economic outlook be, in view of these events that have just taken place. Is this decline tied directly to the US elections? Are

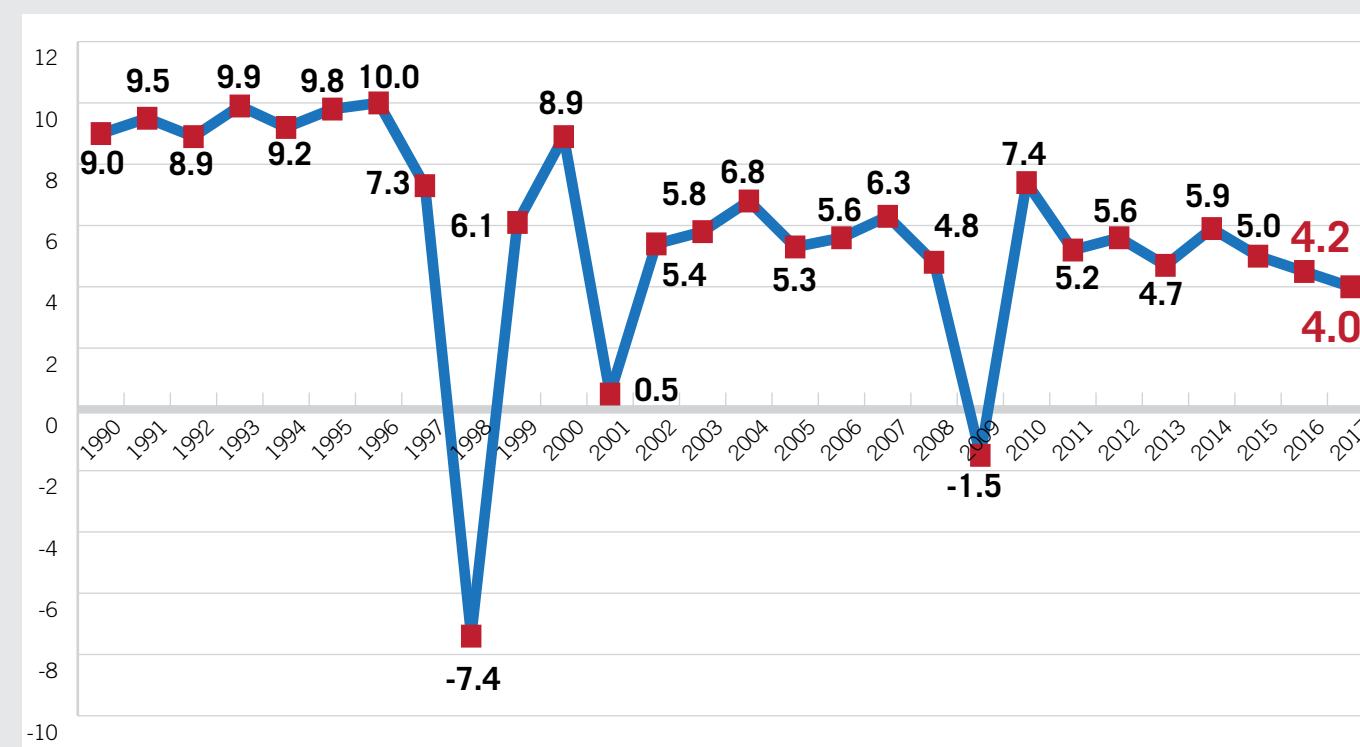


Figure 1: Malaysia's GDP Growth Rate 1990-2017

Source: Bank Negara Malaysia and PIKOM's Forecasts

there other underlying factors that are coincidentally surfacing? These are perhaps some of the 'burning' questions.

Gross domestic product (GDP) growth rate

Between 1990 and 2015, the Malaysian economy enjoyed a peak of GDP growth of 10% (1996) and a trough of -7.8% (1998) (Figure 1); for the last 15 years it has been averaging 5.6% (not taking into consideration 2009 when the GDP was -1.6%).

In 2015, Malaysia's economy registered a 5.0% growth rate (as projected in PIKOM ICT Job Market Outlook June 2015). This was lower than the 6.0% growth rate of 2014 but was still better than the expected lower growth rate of less than 5.0%. The economy grew strongly in the last quarter of the year which boosted

the overall GDP to a better than expected number for 2015.

From the Department of Statistics Malaysia's official portal, it was noted that GDP for Q4 of 2015 and Q1 of 2016 was 4.5% and 4.2% respectively. While the first quarter of 2016 didn't perform as well as the last quarter of 2015, the deterioration was not as severe as market anticipation. All production sectors (except Agriculture) posted positive growth with Services (5.1%), Manufacturing (4.5%) and Construction (3.8%) being the main drivers. On the expenditure side, the economy for the quarter was largely driven by Private (5.3%) and Public consumption (3.8%).

In the middle of 2016, leading local research institution Malaysian Institute of Economic Research (MIER) forecasted a growth rate of

4.2% for 2016. International financial institutions, in particular World Bank, International Monetary Fund (IMF) and Asian Development Bank (ADB) have projected growth rates for Malaysia to linger between 4.2% and 4.5% in 2016. However, all these research and development institutions have also expressed strong confidence that the Malaysian economy would bounce back in 2017, at least to register a growth rate of 4.5% to 5.0%.

With recent global events, it will be a challenge to achieve the higher end of the estimate. The domestic market demand is expected to continue driving growth but the only concern is the external sector which is not as resilient, as underlying factors such as the continuing uncertainty in the prices of natural gas, crude and other petroleum products are still having the greatest impact on this sector.



Q2 of 2016 marked the worst economic performance since the height of the global financial crisis in 2009. This poor Q2 performance was offset by better Q3 performance as high-frequency indicators painted a better picture for Q3. Going against market expectations, exports grew in August, after 22 consecutive months of contraction. This was mainly driven by increases in exports of electronic products and of palm oil. Similarly, industrial production accelerated in August due to the high growth in the manufacturing and electronics sectors.

As reported in the recent MITI Weekly Bulletin (Volume 412) dated 15th September, 2016, the GDP growth for the last three quarters were; Q1: 4.2%, Q2: 4.0% and Q3: 4.3%. In view of the recent global events including the outcome of the US election, we foresee a slight dip for Q4 to about 4.2%. This will give us an overall GDP growth projection of about 4.2% for the whole of 2016, which will be lower than 2015 (Figure 1). However we must not ignore the longer-term impact of recent events, in particular the imminent changes in US economic policies and threat of a slower Chinese economy; that can potentially be more far reaching in 2017. With a less optimistic view for a rebound in 2017, we are forecasting a lower GDP growth of 4.0% for 2017. While our fundamentals have not changed, the lower forecast is based on concerns over uncertainty and upward risks in the external environment.

Domestic demand

As always, domestic demand is largely driven by private and public consumption expenditure (Table 1). Over the past five

years, private consumption has been expanding at an average annual growth rate (AAGR) of 7.1% and public consumption expenditure at an AAGR of 6.8%. Overall consumption growth stood at an AAGR of 7.0%.

In tandem with consumption expenditure expansion, the gross capital formation of the private sector registered an AAGR of 12.1% but public gross capital formation recorded an AAGR of only 2.7% as contributed through the Government’s drive via Economic Transformation and Corridor projects.

This is also reflected in the share of gross capital formation, in which the private sector had increased its portion from 55.0% in 2010 to 65.4% in 2015. The public sector’s share had reduced from 45.0% to 34.6% during this period. In other words, the private sector is incrementally being positioned to be Malaysia’s engine of future growth.

However, the lower forecasted GDP in turn projected a declining growth rate of public sector consumption expenditure, which registered a year-on-year (y-o-y) growth rate of 14.2% in 2011 in comparison to only 4.3% in 2015. This is because the public is expected to spend less on supplies and services following the Government’s expenditure rationalisation measures. This in turn will have an effect on private consumption expenditure. Though private consumption expenditure growth has been higher than that of the public sector, it is also showing a decline with a drop in y-o-y growth rate of 8.3% in 2011 to 6.0% in 2015.

CONSTANT PRICES (2010=100)													
Period	Final consumption expenditure						Gross fixed capital formation						Gross Domestic Product (GDP)
	Total	Y-o-Y (%)	Private sector	Y-o-Y (%)	Public sector	Y-o-Y (%)	Total	Y-o-Y (%)	Private sector	Y-o-Y (%)	Public sector	Y-o-Y (%)	
2010	498,591		395,245		103,346		184,292		101,291		83,001		821,434
2011	540,359	8.4	422,376	6.9	117,983	14.2	195,996	6.4	110,863	9.5	85,133	2.6	864,920
2012	582,015	7.7	457,625	8.3	124,390	5.4	233,203	19.0	134,543	21.4	98,659	15.9	912,261
2013	622,517	7.0	490,798	7.2	131,719	5.9	252,271	8.2	151,749	12.8	100,522	1.9	955,260
2014	662,490	6.4	524,979	7.0	137,511	4.4	264,276	4.8	168,510	11.0	95,765	-4.7	1,012,506
2015	699,694	5.6	556,304	6.0	143,389	4.3	274,144	3.7	179,375	6.4	94,768	-1.0	1,062,647
"AAGR: 2010-2015 (%)"	7.0		7.1		6.8		8.3		12.1		2.7		

Period	Final Consumption Expenditure : Sectoral Share (%)			Gross Fixed Capital Formation : Sectoral Share (%)			
	Total	Private sector	Public sector	Total	Private sector	Public sector	
2010	100.0	79.3	20.7	100.0	55.0	45.0	
2011	100.0	78.2	21.8	100.0	56.6	43.4	
2012	100.0	78.6	21.4	100.0	57.7	42.3	
2013	100.0	78.8	21.2	100.0	60.2	39.8	
2014	100.0	79.2	20.8	100.0	63.8	36.2	
2015	100.0	79.5	20.5	100.0	65.4	34.6	

Period	Final Consumption Expenditure : Share of GDP (%)			Gross Fixed Capital Formation : Share of GDP (%)			GDP
	Total	Private sector	Public sector	Total	Private sector	Public sector	
2010	60.7	48.1	12.6	22.4	12.3	10.1	100.0
2011	62.5	48.8	13.6	22.7	12.8	9.8	100.0
2012	63.8	50.2	13.6	25.6	14.7	10.8	100.0
2013	65.2	51.4	13.8	26.4	15.9	10.5	100.0
2014	65.4	51.8	13.6	26.1	16.6	9.5	100.0
2015	65.8	52.4	13.5	25.8	16.9	8.9	100.0

Table 1: Final Consumption Expenditure and Gross Capital Formation by Private and Public Sectors: 2010 - 2015
Source: Bank Negara Malaysia

The slower growth in public investments was due to a decline in the Federal Government's development expenditure and lower capital spending by public enterprises. The lower spending on fixed assets mainly reflected the completion or near-completion of several projects. There was also less spent on machinery and equipment during the year, mainly in the Utilities and Air Transportation sub-sectors.

External demand

Overall trade dependency

Being a trading nation, Malaysia's dependence on global trade is a vital factor in its economic growth. Despite a negative growth during the 2009 Global Financial Crisis, exports have grown at an AAGR of 4.9% over the past 10 years from 2005 onwards.

Similarly, imports rose steadily at 5.5% during this period (Figure 2). For the period from January to September 2016, exports grew by 0.5% to RM568.36 billion and imports increased by 0.7% to RM508.59 billion for the same period in 2015. Trade surplus of RM59.77 billion was recorded for the nine months representing a slight decrease from RM60.47 billion in the same period in 2015. In terms of overall trade, there is a slight increase to RM1.078 billion in 2016 as compared with the same period in 2015 of RM1.071 billion (Source: MATRADE).

However, there continues to be concerns over the volatility of the global economy with the imminent softer macro-economic data, in particular increasing interest rates, strong US currency, changing policies, slowdown

of the Chinese economy and the ongoing anaemic growth in the Eurozone. All these factors will affect our exports.

Over the years, Malaysia's growth in overall trade is well supported by regional growth and its strong ties with China, India, Japan, South Korea and ASEAN countries. Positive growth in these countries results in economic gains for Malaysia. High economic activities in China, India and ASEAN nations augur well for Malaysia as 60% of its total trade is centred on these countries. Malaysia has also attracted substantial investments from advanced economies like Japan, South Korea and Singapore.

Table 2a and 2b give a comparison of the export and import figures for the period January to September for

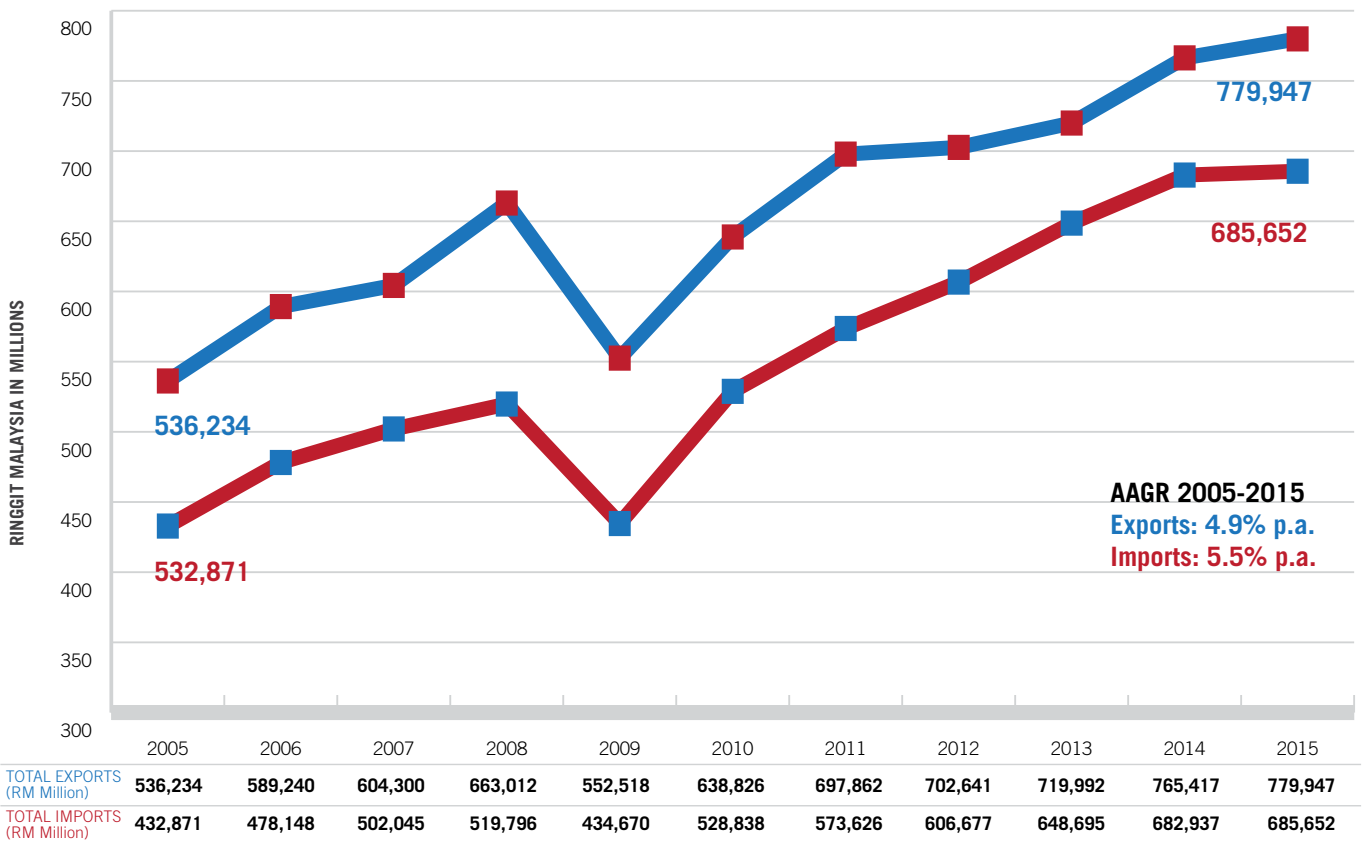


Figure 2: Exports and Imports in Malaysia, 2005-2015
Source: Bank Negara Malaysia

2015 and 2016. Not in the table are the Philippines, Myanmar, Brunei, Cambodia and Lao PDR which

collectively receive about RM15.47 billion worth of exports from Malaysia. Generally, exports to ASEAN grew by

about 5.0% for January to September in 2016 for a total value of RM168.29 billion. (Source: MATRADE)

Countries	Jan-Sep 2016 (RM million)	Jan-Sep 2015 (RM million)
Singapore	83,332.7	79,148.5
China	67,898.1	74,222.2
USA	59,347.9	53,248.9
Japan	46,349.7	53,172.8
Thailand	32,271.6	32,530.9
Hong Kong	27,476.0	27,640.6
India	23,541.5	23,291.1
Indonesia	19,899.9	21,534.8
Australia	19,195.4	19,777.8
Vietnam	17,324.9	12,510.5
Total	568,359.2	565,776.1

Table 2a: Major Export Markets (Jan-Sep)
Source: MATRADE

Countries	Jan-Sep 2016 (RM million)	Jan-Sep 2015 (RM million)
China	102,703.8	94,121
Singapore	53,348.5	60,765.4
Japan	41,745.9	40,084.8
USA	41,342.6	40,302.2
Thailand	31,035.8	29,899.7
Taiwan	30,369.4	27,134.9
ROK	27,248.9	22,769.1
Indonesia	20,911.9	22,456.7
Germany	17,460.3	17,409.3
Vietnam	13,298.7	13,504.9
Total	508,592.0	565,776.1

Table 2b: Major Import Sources (Jan- Sep)
Source: MATRADE

	Services	Telecommunications, Computer and Information Services				Sectoral Share	Services	Telecommunications, Computer and Information Services				Sectoral Share (%)
Period	Credit / Export of Services					Debit / Import of Services						
	(RM million)	Y-o-Y (%)	(RM million)	Y-o-Y (%)	(%)	(RM million)	Y-o-Y (%)	(RM million)	Y-o-Y (%)	(%)		
2010	111,466		6,851		6.1	104,910		6,377		6.1		
2011	118,880	6.7	7,412	8.2	6.2	117,424	11.9	7,246	13.6	6.2		
2012	125,337	5.4	9,033	21.9	7.2	133,879	14.0	8,549	18.0	6.4		
2013	132,685	5.9	9,001	-0.4	6.8	142,277	6.3	10,065	17.7	7.1		
2014	137,263	3.5	8,963	-0.4	6.5	148,451	4.3	10,062	0.0	6.8		
2015	135,663	-1.2	10,411	16.2	7.7	156,141	5.2	12,653	25.8	8.1		
AAGR: 2010-2015		4.0		8.7			8.3		14.7			

Table 2c: Exports and Imports of Services and Share of Telecommunications, Computer and Information, 2010-2015
Source: Bank Negara Malaysia

Foreign direct investment

Malaysia is still very dependent on Foreign Direct Investments (FDI) despite the aggressive promotion of internal growth through R&D and patenting, commercialisation and innovation strategies. As shown in Table 3, overall FDI has been registering a positive growth rate of 5.9% per annum during the period 2010-2015;

that is, FDI value increased from RM92,660 million to RM123,430 million. In terms of direction, the bulk of the investments came from Europe, which recorded expansion in its share by 31.0% in 2015, followed by East Asia of 22.1%; newly industrialised ASEAN neighbours Singapore and Thailand together accounted for 21.0%. Taken as individual investor nations,

Japan, Singapore and the Netherlands consistently top the list as major investors in Malaysia. Regionally, the bulk of FDI came from North Asia followed by Europe and ASEAN nations. Naturally, there was hardly any FDI from countries facing economic or political issues. This positive sentiment regarding investments into Malaysia is expected to continue in the long run.

Period	Latin America: Bermuda / Cayman Islands / Virgin Islands	North America	Southeast Asia: Thailand & Singapore	East Asia: Korea / Japan / Taiwan	Europe	Oceania	Other Countries	Total
Foreign Direct Investment Credit (RM million)								
2010	7,968	16,067	16,087	20,113	26,121	1,520	4,785	92,660
2011	7,059	12,240	21,951	27,423	24,828	1,977	7,642	103,121
2012	9,821	11,742	23,058	27,082	25,834	3,563	6,417	107,516
2013	10,898	9,521	20,051	29,730	25,320	1,848	6,500	103,868
2014	10,235	11,744	23,666	20,176	36,770	1,755	7,780	112,126
2015	8,159	16,965	25,911	27,221	38,288	1,182	5,704	123,430
AAGR : 2010-2015 (%)	0.5	1.1	10.0	6.2	7.9	-4.9	3.6	5.9
Foreign Direct Investment Credit Y-o-Y (%)								
2011	-11.4	-23.8	36.5	36.3	-4.9	30.1	59.7	11.3
2012	39.1	-4.1	5.0	-1.2	4.1	80.2	-16.0	4.3
2013	11.0	-18.9	-13.0	9.8	-2.0	-48.1	1.3	-3.4
2014	-6.1	23.4	18.0	-32.1	45.2	-5.1	19.7	7.9
2015	-20.3	44.5	9.5	34.9	4.1	-32.6	-26.7	10.1
Foreign Direct Investment Credit : Share by Country (%)								
2010	8.6	17.3	17.4	21.7	28.2	1.6	5.2	100.0
2011	6.8	11.9	21.3	26.6	24.1	1.9	7.4	100.0
2012	9.1	10.9	21.4	25.2	24.0	3.3	6.0	100.0
2013	10.5	9.2	19.3	28.6	24.4	1.8	6.3	100.0
2014	9.1	10.5	21.1	18.0	32.8	1.6	6.9	100.0
2015	6.6	13.7	21.0	22.1	31.0	1.0	4.6	100.0

Table 3: Foreign Direct Investment Credits of Services and Share of Telecommunications, Computers and Information by Region, 2010-2015

Source: Bank Negara Malaysia

More importantly, domestic and foreign investment in the ICT sector is imperative for the nation to attain its knowledge-based economy status towards becoming a developed nation by 2020. As shown in Table 4, the FDI investment in the ICT sector also grew impressively to RM5,851 million in 2015 from RM3,900 million five years ago, thus registering an AAGR of 8.4%. In terms of sectoral share, the manufacturing sector still has the largest portion of FDI, accounting for 56% in 2015, which was at 59.7% half a decade ago.

Macro selected indicators

Despite some inherent challenges, macro-economic fundamentals for Malaysia remain largely stable. The country still enjoys low inflation rates, low unemployment and manageable overnight lending rates, well supported prudent financial management systems and fiscal policies. As reported by Bank Negara Malaysia (BNM) - the policy makers, the economy is expected to expand within expectations for 2016, with stable growth into 2017.

Lending rates

Overall interest rates averaged 2.98% between 2004 and 2016, peaking at 3.5% in 2006 and posting a low of 2.0% in 2009.

In response to concerns on growing household debt, BNM increased the Overnight Policy Rate (OPR) to 3.25% on 10 July, 2014 and this rate was maintained until the Monetary Policy Committee (MPC) meeting in July 2016, whereby the OPR was reduced to 3.00% and this was subsequently maintained during the MPC in September 2016.

Period	Total	Agriculture, Forestry and Fishing	Mining and Quarrying (including oil and gas)	Manufacturing	Construction	Wholesale and Retail Trade	Information and Communication	Financial and Insurance/ Takaful Activities	Other Services
Credit (RM millions)									
2010	92,660	13	7,781	55,274	361	14,313	3,900	8,737	2,279
2011	103,121	212	9,946	58,852	521	10,354	2,444	12,886	7,906
2012	107,516	338	13,030	62,913	809	11,022	5,151	9,080	5,173
2013	103,868	1,039	14,629	55,218	1,487	9,883	4,958	8,048	8,607
2014	112,126	500	16,321	56,881	1,598	13,066	4,692	12,444	6,623
2015	123,430	71	18,035	69,118	2,254	9,703	5,851	11,410	6,988
AAGR: 2010- 2015 (%)	5.9	39.6	18.3	4.6	44.2	-7.5	8.4	5.5	25.1

FDI Credit : Y-o-Y Growth Rate (%)									
2011	11.3	1471.4	27.8	6.5	44.3	-27.7	-37.3	47.5	246.8
2012	4.3	59.3	31.0	6.9	55.4	6.4	110.8	-29.5	-34.6
2013	-3.4	207.8	12.3	-12.2	83.7	-10.3	-3.8	-11.4	66.4
2014	7.9	-51.9	11.6	3.0	7.5	32.2	-5.4	54.6	-23.0
2015	10.1	-85.7	10.5	21.5	41.0	-25.7	24.7	-8.3	5.5

FDI Credit : Sectoral Share (%)									
2010	100.0	0.0	8.4	59.7	0.4	15.4	4.2	9.4	2.5
2011	100.0	0.2	9.6	57.1	0.5	10.0	2.4	12.5	7.7
2012	100.0	0.3	12.1	58.5	0.8	10.3	4.8	8.4	4.8
2013	100.0	1.0	14.1	53.2	1.4	9.5	4.8	7.7	8.3
2014	100.0	0.4	14.6	50.7	1.4	11.7	4.2	11.1	5.9
2015	100.0	0.1	14.6	56.0	1.8	7.9	4.7	9.2	5.7

Table 4: Foreign Direct Investment Credits of Services and Share of Telecommunications, Computers and Information by Sector, 2010-2015

Source: Bank Negara Malaysia

The ceiling and floor rates of the corridor for the OPR are correspondingly reduced to 3.25% and 2.75% respectively. To cushion a faltering growth momentum going into 2017, there is a likelihood that BNM may further reduce the OPR in the coming MPC but it would have to balance against a further weakening of the ringgit.

As shown in Figure 3, the overnight rate follows the OPR trend.

Inflation rate

As depicted in Figure 4, the average inflation rate declined to 2.1% in 2015 from 3.1% in 2014. However, some leading

research institutions have earlier projected the inflation rate to shore up to 2.9% in 2016. Notably, the government's ongoing subsidy rationalisation efforts that began in 2013, weakening of the ringgit impacting cost of imports and the 6% Goods and Services Tax (GST) that was implemented in April 2015, will continue to exert pressure on inflation figures although the impact of GST will be stabilised in the long term. Despite these challenges, inflation rates should be contained due to falling petrol prices in the international market and more so, reduced fuel costs at retail level can help to mitigate business overheads and operating costs, mainly transportation.

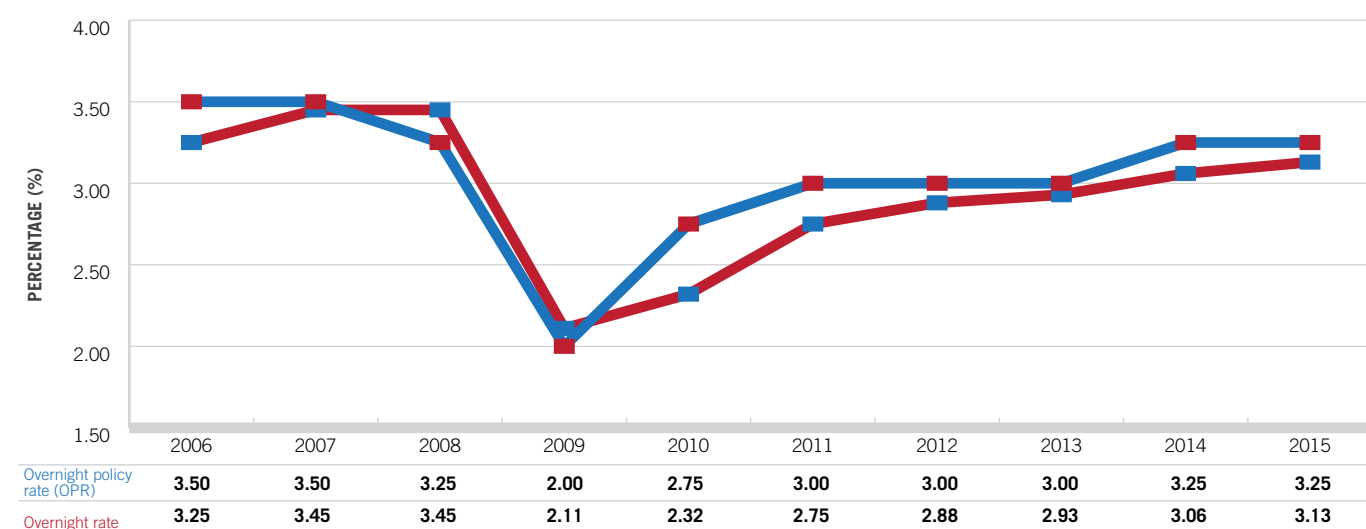


Figure 3 Overnight Policy Rate (OPR): 2006-2015

Source: Bank Negara Malaysia

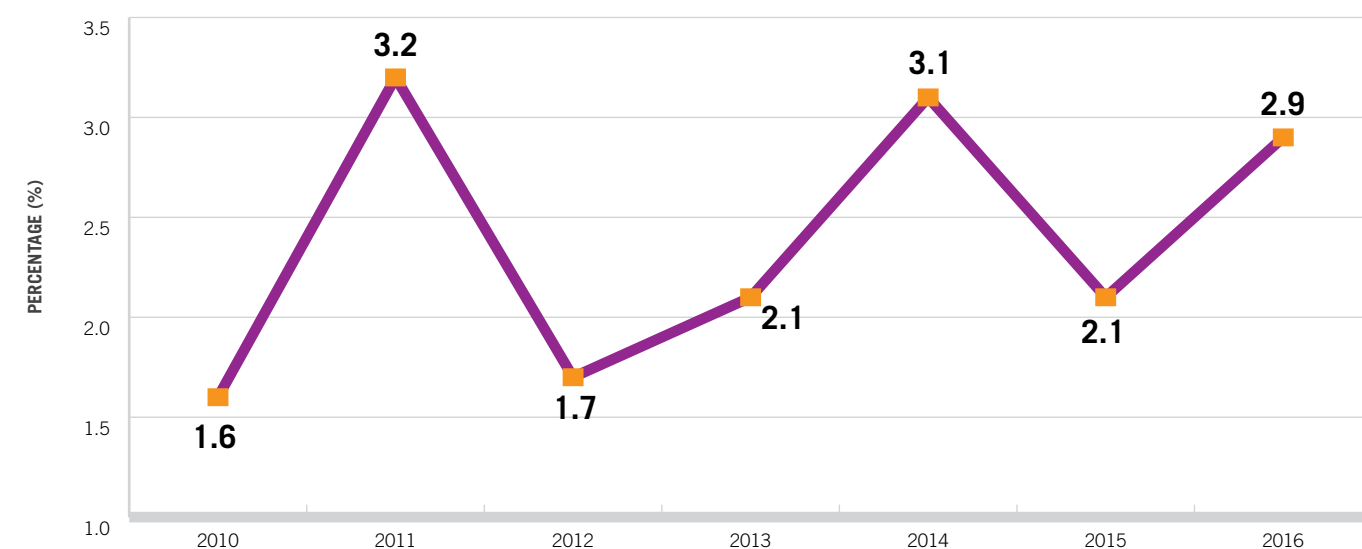


Figure 4 : Malaysian Annual Inflation Rate: 2010-2016

Source: Bank Negara Malaysia & PIKOM's Forecasts for 2016

Employment and unemployment rate

Malaysia's employment figures rose from 11.96 million in 2010 to 13.84 million by end of 2015, clocking in an AAGR of 2.96%; see Figure 5. Concurrently, unemployment rates fluctuated, highest at 3.6% and lowest at 2.7% during these period; see Figure 6. In fact, Malaysia's overall unemployment rate has remained well below 4.0% not only in recent years but even way back since 1990, effectively reflecting full employment with perhaps frictional unemployment down to job seekers' choosiness. These consistently low figures are the result of the numerous jobs being created in the pursuit

of industrialisation and positive Foreign Direct Investment (FDI) since 1982.

Over the years, Malaysia has been importing significant foreign labour to ease the labour shortages especially in the production and operations sectors. ICT knowledge workers have also been brought in to meet the demand in high value adding sectors as well as R&D and innovation activities.

However, despite these two phenomena, unemployment among graduates has always been a critical political and

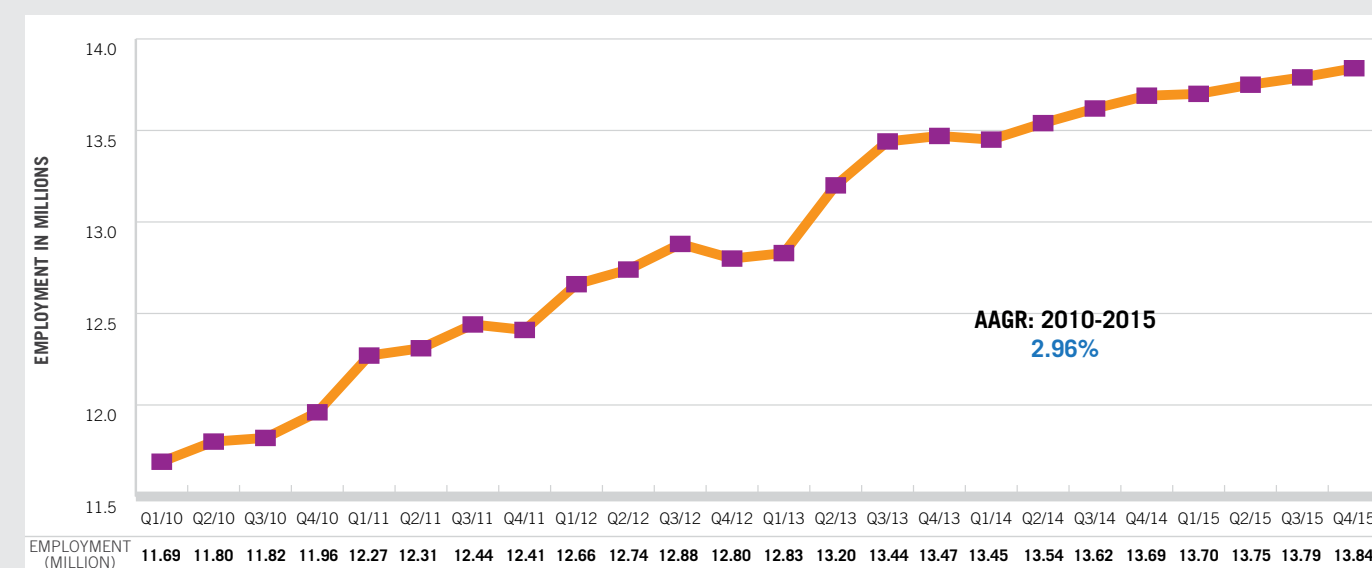


Figure 5: Malaysian Employment: Q12010 – Q42015

Source: Bank Negara Malaysia

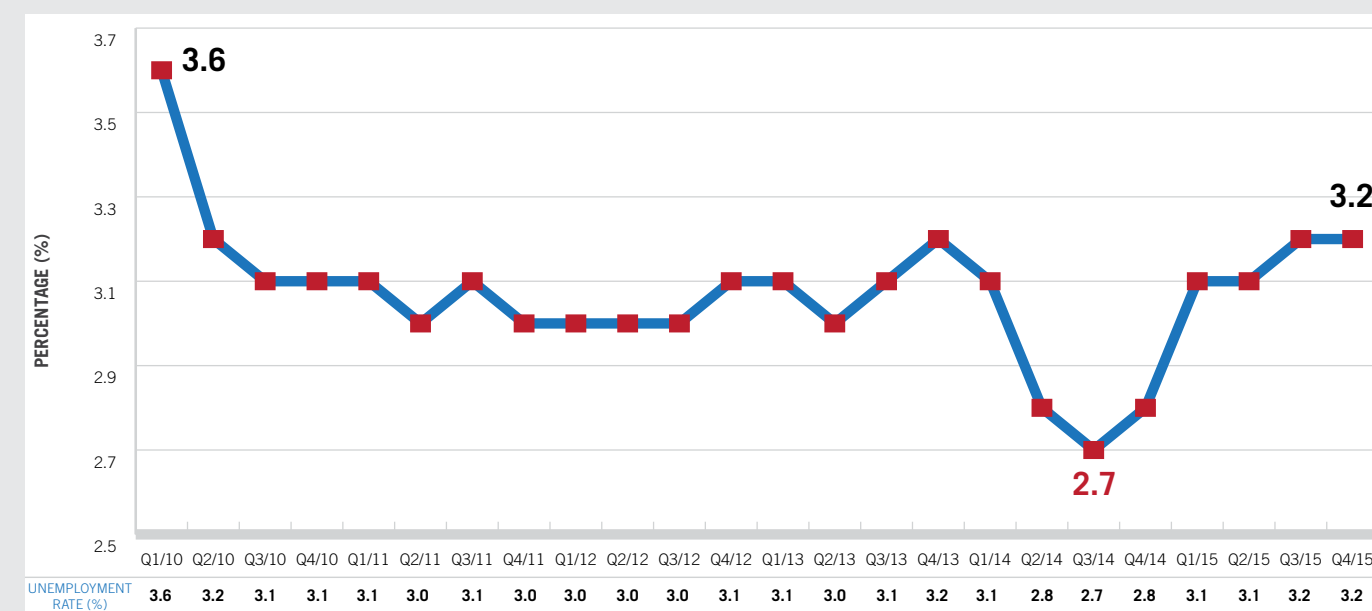


Figure 6 : Unemployment Rate in Malaysia, Q12010-Q42015

Source: Bank Negara Malaysia

social issue. While there are graduates who are highly selective about job placements, a significant number also end up in fields that are not related to their qualifications. A major contributing reason for unemployment among graduates is also the lack of certain skills, experience and exposure. These include not only technical skills, but soft skills such as problem solving, confidence, leadership, communication and a good command of English.

Foreign exchange rate

As shown in Figure 7, the value of the Malaysian Ringgit against the US Dollar has consistently dropped from RM3.157 in August 2014 to RM4.446 in September 2015 before recovering to RM3.905 in April 2016. Thereafter, the Ringgit started falling again and was at RM4.297 in November 2016. During this period, the Malaysian currency weakened by about 36%, sending disturbing signals to the

business community especially those dealing with cross-border transactions in USD. In the recent days after the US elections, the Ringgit against the Dollar again took a thrashing, prompting Bank Negara to curtail trading of the Ringgit. On 12th November 2016, the Ringgit was trading at the peak of 4.37 (trading at 3.94 in July 2016) with the Dollar.

What are the underlying factors that continued to weaken our Ringgit?

- ✓ The current US 10 year treasury yield is experiencing higher yield and this will prompt capital to flow back to a higher yield haven.
- ✓ During Trump's campaign, he advocated deregulating the oil and shale sectors in the US. This can potentially make drilling costs cheaper and consequently greater production towards a self-sustaining state. If imports are no longer needed and the US increases

oil production, there may potentially be a supply glut, leading to lower oil prices which will impact Malaysia if it goes below USD45 per barrel.

- ✓ Trump may increase the interest rate to boost the US economy and this will certainly lead to a stronger Dollar and by default a weakened Ringgit.
- ✓ To stimulate domestic consumption and spur the economy, BNM will not only maintain a low interest rate regime but may cut the rate further.
- ✓ The foreign holdings for Malaysia government bonds are quite high and some of these bonds are maturing in the near term and investors may not consider reinvesting in Malaysia since US yields are also picking up.
- ✓ The default of 1MDB after it missed a payment on a bond amid a dispute with an Abu Dhabi-based investment fund has also affected investors' confidence and this has further weighed on the Ringgit.

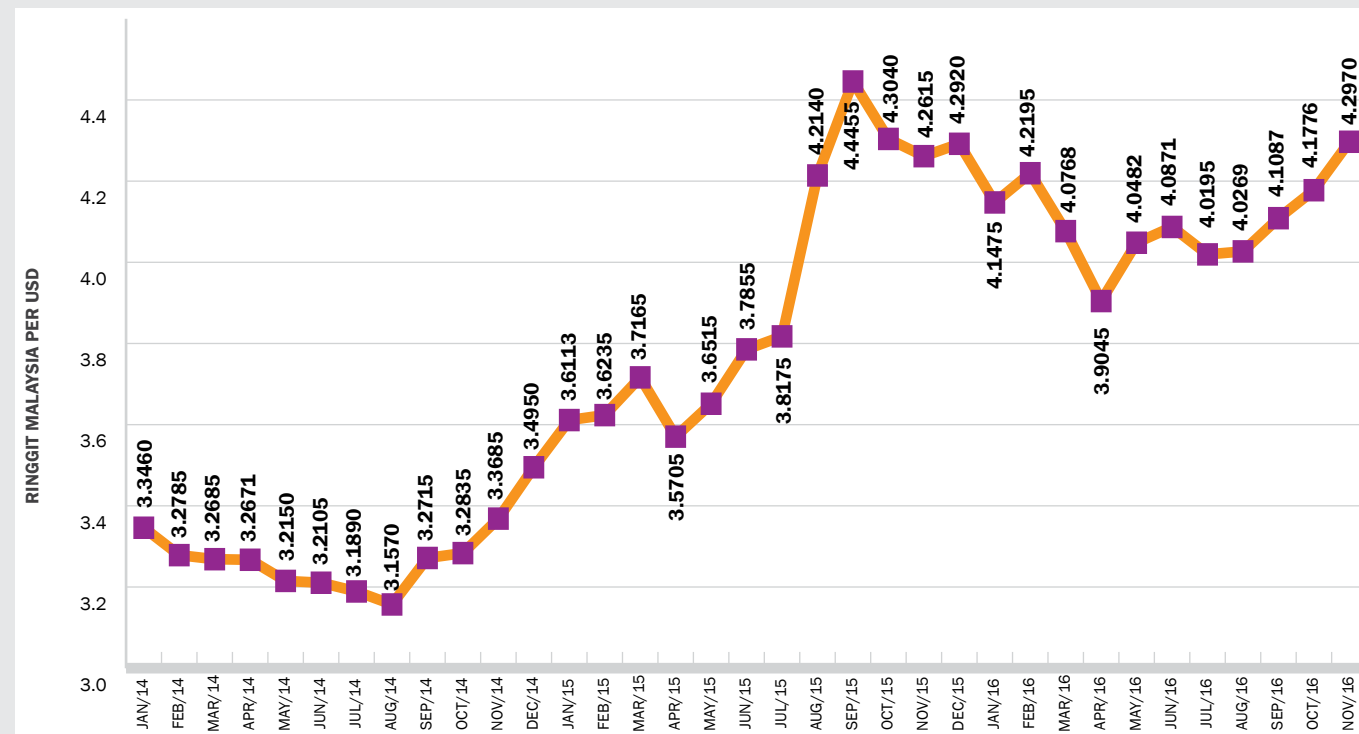


Figure 7: Malaysian Foreign Exchange Rate per USD January 2014-November 2016

Source: Bank Negara Malaysia

In essence, the Ringgit will weaken if it faces continuous outflow pressure, strengthening of the Dollar and declining commodity prices in particular crude oil prices.

ICT industry outlook

The overall Malaysian ICT industry continues to flourish in particular the ICT Services sector. Past years' figures have consistently shown an upward trend in the services sector with the ICT Products (Manufacturing) sector on the decline.

A number of fundamental factors have been spurring this growth for the industry. They include the various ongoing national transformation plans, rising middle level income population and a very fragmented market that is mostly focusing on urban areas and cities such as Kuala Lumpur, Penang and Johor, leaving great potential for further development in the other states, including in East Malaysia. Factors such as the low PC penetration especially in the rural areas, an improving internet and broadband penetration rate and cost (albeit still relatively high compared to the economies in the region) and continuous efforts and measures by the Government to develop the country into a regional services hub such as outsourcing for specific industries also help the industry.

Oil and Gas is among the industries that utilises and leverages on Technology and ICT a great deal and has often been the most attractive sector for employment and contributes immensely to the growth in the ICT industry. Overall, other key industries that are still very much buoyant

and will continue to have demand for ICT are Government, Telecommunications, Education, Financial Services and Health.

Overall ICT industry performance

The entire ICT Industry is broadly grouped into two categories – ICT products (Manufacturing) and ICT Services sectors. According to the ICT Satellite National Accounts statistics of Department of Statistics Malaysia (DOSM), the GDP value of ICT products broadly constitutes; computers and peripheral equipment, communications equipment, consumer electronics equipment and various ICT components. On the other hand, the ICT Services sector encompasses a wide range of services and products from the Internet and telecommunications field, satellite and data communication services, to hardware and software, publishing, media, data processing, e-commerce and ICT trade services.

The total ICT value increased from RM105.7 billion in 2010 to RM137.6 billion in 2014, thus recording an AAGR of 6.8% for the period 2010-2014. Based on an AAGR of 6.8%, the total ICT value has been estimated to reach RM147.0 billion in 2015. This is attributed to positive growth registered in ICT Manufacturing, ICT Services, e-commerce and ICT trade in services. The share of overall ICT industry to the economy expanded from 16.5% in 2010 to 17.6% by 2015. Contribution from e-commerce related services has been on the rise albeit slower as compared to the other countries. Its share to the economy has increased from 3.6% to 4.8% during this period; see Figure 8.

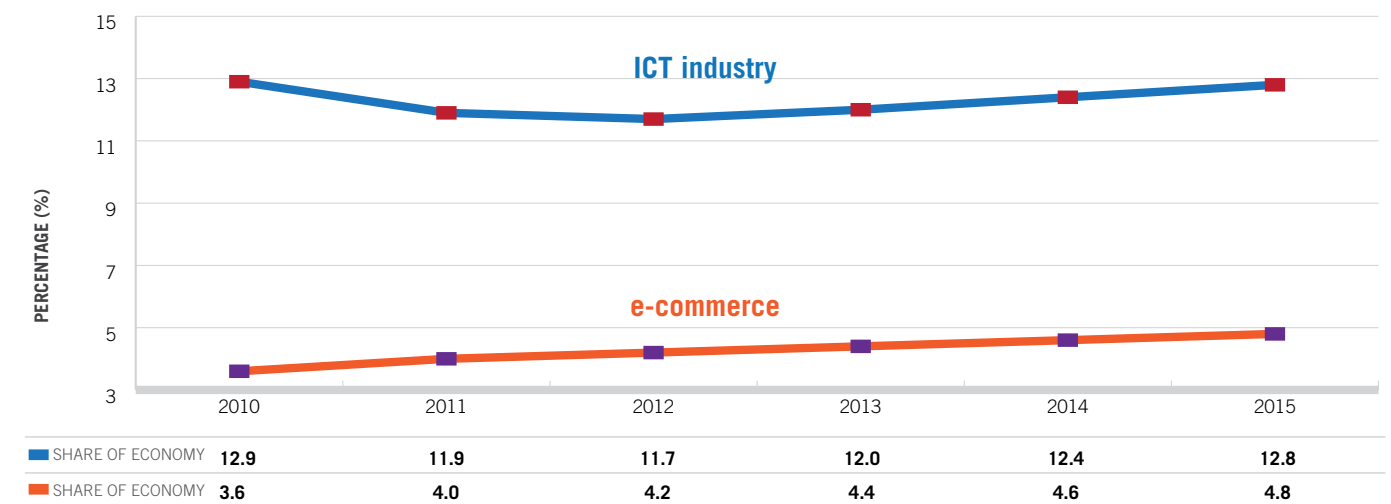


Figure 8: Share of ICT Industry and E-Commerce to the Economy: 2010-2015

Source: Department of Statistics Malaysia

ICT products (manufacturing) performance

Despite facing challenges in the electronics industry, the overall ICT manufacturing still grew positively as shown in the Electronics Production Index. This index grew from 108.1 in first quarter of 2010 to 153.8 in the last quarter of 2015; see Figure 9.

Nonetheless, further examination showed that the hardware production component in the ICT manufacturing

sector, in particular integrated circuits, semi-conductors and electronic transistors, has registered a significant decline over the years in terms of production units. As shown in table 5, production of integrated circuits and semi-conductors registered negative growth with an AAGR of -8.6% and -8.1% respectively during the period 2010-2015. The electronics transistors segment recorded positive growth of 0.77%, which is considered very low in comparison to its performance during the early nineties.

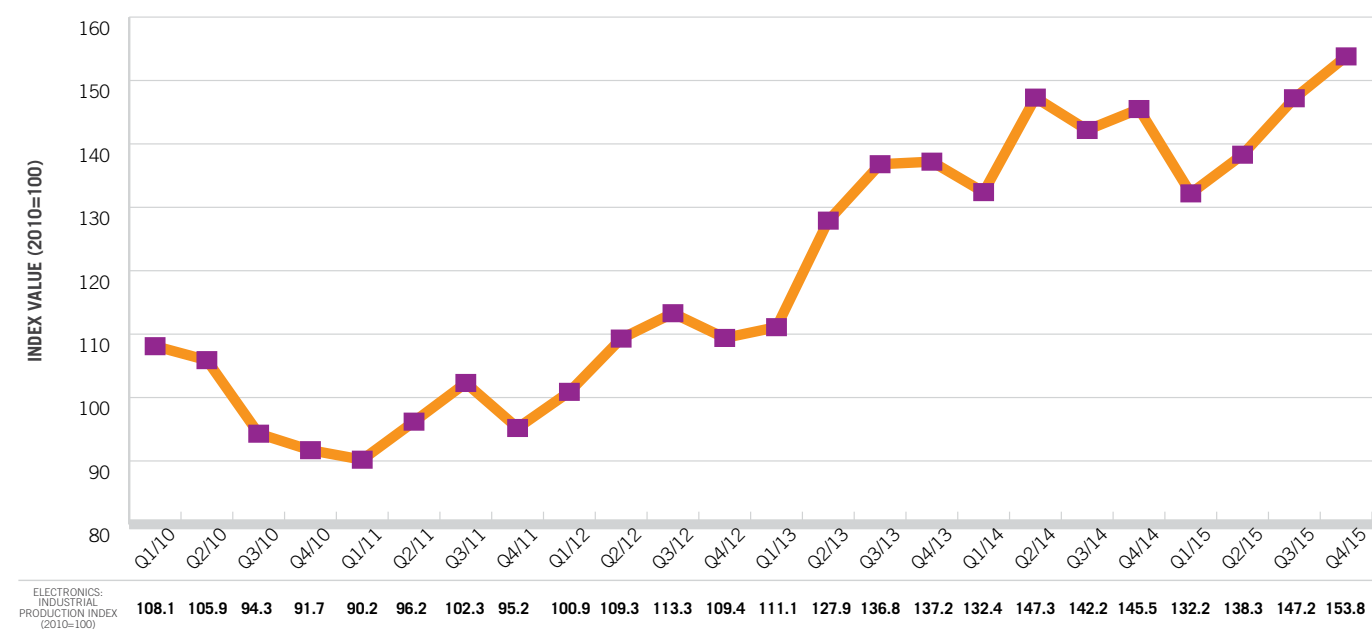


Figure 9: Electronics Industrial Production Index: Q12010-Q42015

Source: Bank Negara Malaysia

Period	Integrated circuits (million units)	Semiconductors (million units)	Electronic transistors (million units)
2010	38007	17997	34184
2011	33380	16281	34189
2012	39391	19765	36119
2013	35686	19281	35362
2014	24613	15017	36577
2015	24253	11797	35523
"AAGR : 2010-2015 (%)"	-8.6	-8.1	0.77

Table 5: Production Volume of Selected Micro-Electronics Items: 2010-2015

Source: Bank Negara Malaysia

As shown in Figure 10, these three IT sectors have been declining since 2000 and this is not unexpected as the emerging lower cost production economies in Asia, in particular China and Vietnam, have been on the rise since the turn of the century. Besides that, with the emergence of new digital technologies, the demand for these micro-electronics components has fallen, leading to closure of many of the plants.

ICT services sector performance

The Service sector on the other hand, has been experiencing consistent growth since 2000. Share of the ICT Services sector to GDP has almost doubled from 3.3% in 2000 to 6.6% in 2015; and it is projected to reach 7.0% by end of 2016 (Figure 11).

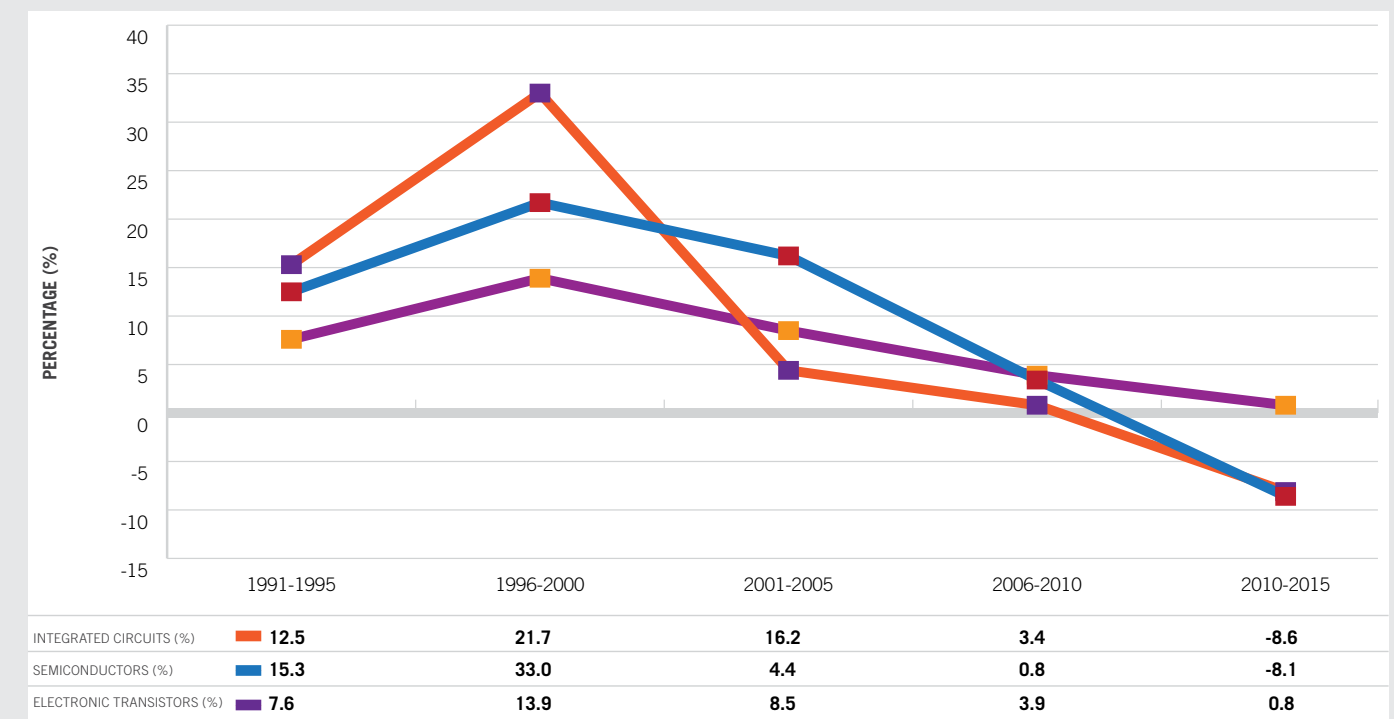


Figure 10: Average Annual Growth Rate of Selected Micro-electronics Items: 1991-2015

Source: Bank Negara Malaysia

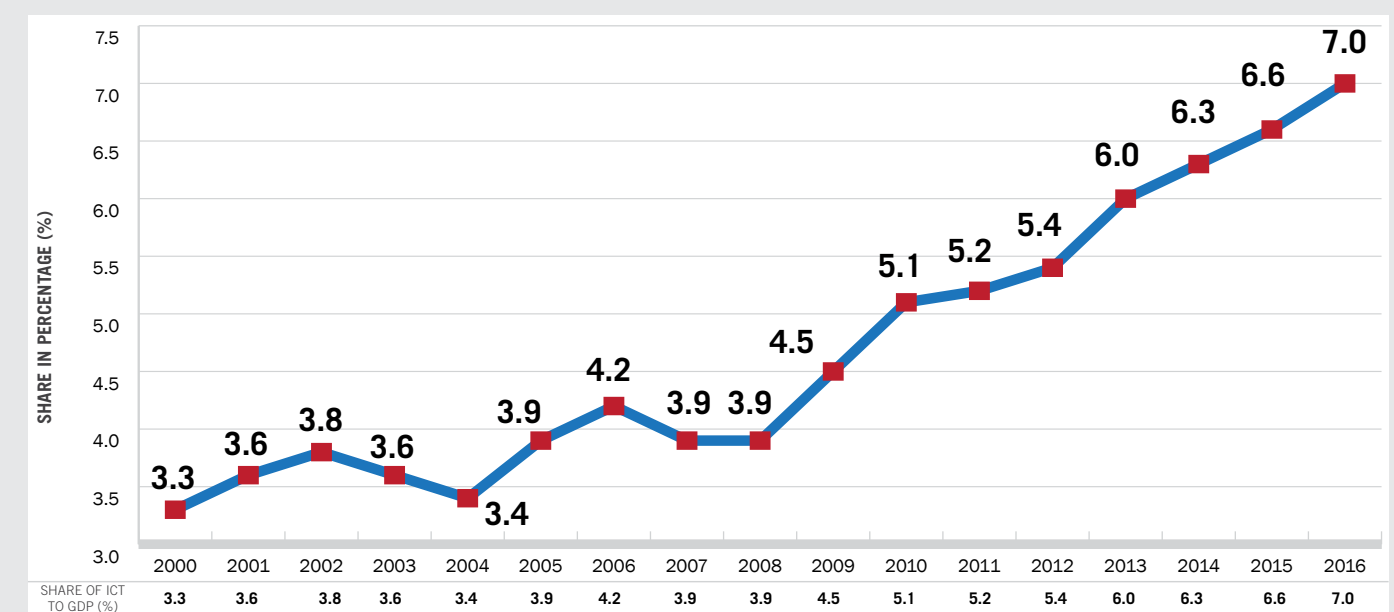


Figure 11: Share of ICT Services (ICTS) to GDP, 2000-2015

Source: Department of Statistics and PIKOM Estimates

As depicted in Table 6, after the Global Financial Crisis in 2009, the value added services of the ICT Services sector expanded from RM41.6 billion in 2010 to RM70.2 billion in 2015, clocking an AAGR of 11.0%. Its value is projected to touch RM77.5 billion by 2016, with a projected year-on-year growth rate of 10.3%. Looking at the sub-sectors' AAGR performance, all except the Publishing; Motion picture, Video, Television Programme and Telecommunication Services segments have been growing at double digit rates; with Programming and Broadcasting recording the highest AAGR of 18.7% during the past five years. This is closely followed by the Information Services sector, which registered an AAGR of 17.8%. The traditional computer services have also

Year	Overall ICTS Value Added Services ('000)	Telecom-munication Services ('000)	Computer Services ('000)	Sub-total	Publishing ('000)	Motion picture, video and television programme ('000)	Program-ming & Broad-casting ('000)	Information Services ('000)	Sub-total
2010	41,593,590	27,106,855	9,360,934	36,467,789	503,080	1,056,006	1,565,327	2,001,388	5,125,801
2011	45,259,877	29,778,845	9,945,621	39,724,466	590,079	1,065,823	1,690,288	2,189,221	5,535,411
2012	49,498,475	32,178,234	10,855,882	43,034,116	623,188	1,207,919	2,231,082	2,402,170	6,464,359
2013	57,097,981	36,186,289	13,013,260	49,199,549	708,501	1,261,831	2,655,537	3,272,563	7,898,432
2014	64,142,369	39,967,634	15,072,265	55,039,899	755,818	1,337,788	3,151,607	3,857,257	9,102,470
2015	70,237,209	42,496,875	17,291,392	59,788,267	795,823	1,413,745	3,692,957	4,546,416	10,448,942
2016	77,485,620	45,856,507	19,670,641	65,527,148	830,478	1,489,702	4,279,587	5,358,705	11,958,472
AAGR : 2010 -2015 (%)	11.0	9.4	13.1	10.4	9.6	6.0	18.7	17.8	15.3
Year-on-Year Growth Rate (%)									
2011	8.8	9.9	6.2	8.9	17.3	0.9	8.0	9.4	8.0
2012	9.4	8.1	9.2	8.3	5.6	13.3	32.0	9.7	16.8
2013	15.4	12.5	19.9	14.3	13.7	4.5	19.0	36.2	22.2
2014	12.3	10.4	15.8	11.9	6.7	6.0	18.7	17.9	15.2
2015	9.5	6.3	14.7	8.6	5.3	5.7	17.2	17.9	14.8
2016	10.3	7.9	13.8	9.6	4.4	5.4	15.9	17.9	14.4
Sub-sector Share of Overall ICT Services (%)									
2010	100.0	65.2	22.5	87.7	1.2	2.5	3.8	4.8	12.3
2011	100.0	65.8	22.0	87.8	1.3	2.4	3.7	4.8	12.2
2012	100.0	65.0	21.9	86.9	1.3	2.4	4.5	4.9	13.1
2013	100.0	63.4	22.8	86.2	1.2	2.2	4.7	5.7	13.8
2014	100.0	62.3	23.5	85.8	1.2	2.1	4.9	6.0	14.2
2015	100.0	60.5	24.6	85.1	1.1	2.0	5.3	6.5	14.9
2016	100.0	59.2	25.4	84.6	1.1	1.9	5.5	6.9	15.4

Table 6: Distribution of ICT Services and Growth rate by Sub-sectors, 2000-2015
Source: Department of Statistics, EPU and PIKOM Estimates



Budget 2017 includes a tax relief of RM2,500 for items such as broadband subscriptions, smartphones and tablets to spur domestic consumption.

shown double digit growth rate but at a moderate AAGR of 13.1%. In terms of contribution to the industry, it is worth noting that Telecommunication Services have shown a decline from 65.2% in 2010 to 60.5% in 2015 and is further expected to decline to 59.2% in 2016 (refer Table 6).

As expected, the share of Computer Services to the overall ICT services increased from 22.5% to 24.6% for the period and is projected to reach 25.4% in 2016. Share of the Programming and Broadcasting; and Information Services sub-sectors too have expanded marginally from 3.8% to 5.3%; and 4.8% to 6.5% respectively. Both sub-sectors are expected to continue on this upward trend.

While there was a slight dip in 2015; the two sub-sectors, Telecommunication and Computer Services potentially worth RM 65.5 billion and forming 84.6% of the total contribution, are still expected to be the major contributors to the ICT service sector in 2016.

Budget 2017

Some encouraging announcements in the Budget 2017 that can potentially spur the digital economy are noted as follows:

- a) The continuing funding and focus on eUsahawan and eRezeki programmes with an allocation of RM100 million to develop long-term and sustainable skills and talents in specific target areas and

- needs of the nation is certainly the right strategy going forward.
- b) An allocation of RM1 billion to increase the coverage and quality of broadband (up to 20Mbps) is certainly a major uplift for the ICT industry.
- c) Allocation of RM162 million for e-commerce will certainly spur this sector, given that Malaysia have great potential to leapfrog and be on par with the other developed countries.
- d) Allocation of RM200 million from the Working Capital Guarantee Scheme (WCGS) Fund will be allocated to invigorate start-ups and in addition, encourage investments into high tech start-ups. A new pass category called

Foreign Knowledge Tech Entrepreneurs will also be introduced.

- e) The introduction of Malaysia Digital Hubs will also allow the start-up community to enjoy the full benefits of the MSC Bill of Guarantees and together with the introduction of the 'Foreign Knowledge Tech Entrepreneurs' pass, these will be catalysts for the growth of start-ups.
- f) Provision of tax relief of RM2,500 for items such as broadband subscriptions, smartphones and tablets will spur domestic consumption.
- g) MCMC will also provide free tablets to 430,000 teachers to aid in their teaching, culminating in an allocation of RM340 million, a good injection to spur consumption in the ICT industry.



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2 Dodging Digital Disruption

Malaysia Digital Economy Corporation (MDEC)

“Come gather round people, wherever you roam. And admit that the waters around you have grown.” – Bob Dylan, 1964.

In the song ‘The Times They Are a Changin’, Bob Dylan warns us of the ever present danger of being left behind in a progressive world. Although the context may differ, the metaphors can easily be translated into today’s digital scene. With the wave of digital disruption hitting harder than ever, it is up to the organisations themselves to decide whether to sink into stagnation or swim.

With Big Data, Cloud adoption, the Internet of Things and mobile optimisation at their disposal, organisations can begin to learn to dodge digital disruption simply through an evening spent on Google. There are tons of materials online that teach you about digitalisation, what it is, how to implement it, even case studies of success and failure.

The Malaysia Digital Economy Corporation (MDEC), however, has been a tech evangelist for more than 20 years, with in-depth knowledge of the local tech scene.

Here are some of the soundest advice we’ve given to companies wanting to avoid being disrupted:

Going digital

Digital technology has the ability to cover most, if not all aspects of a business. The 4th industrial revolution will be the inevitable culmination of cyber and physical systems. At the epicenter of the 4th industrial revolution, the Internet of Things

and Big Data Analytics will enable the cyber-physical systems. Previous digitally-untouched areas of business will eventually yield to some form of digital evolution.

Take TheLorry for instance. This is a homegrown effort that is transforming an industry that practices archaic marketing strategies via the provision of a digital platform. From the get go, TheLorry has been utilising mobile optimisation as its modus operandi, hitting the iron while it’s still hot from the hubbub of Grab, MyTeksi and Uber. Starting the effort was no easy task. Rounding up freelance truck drivers and establishing a grassroots connection still required slick business acumen from the founders. This start-up snowball, with the help of technology and innovation, is gathering pace and has created a niche for themselves in the smart logistics space.



Flexibility, modularity

It is important for today’s organisations to keep their core technology flexible and modular. When an organisation learns to understand that new marketing media can aid in building digital business models, they will also learn to keep their organisation’s structure modular in order to accommodate future technology. The finest example of this is the tale of MyTeksi (now Grab), or how the taxi industry learnt to stop worrying and love the digital platform.

Social media is your best friend!

If you were to tell a marketer from the 80s that one day, there will be a platform where they can study everyone’s personalities, ticks, preferences and at the same time create ads that can target these traits;

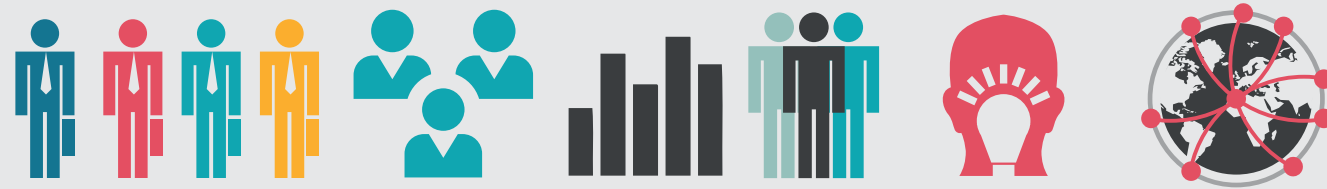


they will most likely call you a liar among other names. But that’s just it, that’s Big Data Analytics.

The correlation between Big Data Analytics and Social Media are intertwined. Think of Social Media as a reservoir and Big Data Analytics as the pipes that help filter and funnel the contents so that you can actually use the contents that

Top 10 Skills

In 2020	In 2015
1. Complex Problem Solving	1. Complex Problem Solving
2. Critical Thinking	2. Emotional Intelligence
3. Creativity	3. People Management
4. People Management	4. Critical Thinking
5. Coordinating with Others	5. Negotiation
6. Emotional Intelligence	6. Quality Control
7. Judgment and Decision Making	7. Service Orientation
8. Service Orientation	8. Judgment and Decision Making
9. Negotiation	9. Active Listening
10. Cognitive Flexibility	10. Creativity



Source: Future of Jobs Report, World Economic Forum

come out of the taps. Big Data has the potential to determine the shape of your business model once you know what to look out for. The best part is, your competitors are streaming from the same reservoir too. Know what to look for and you'll have eyes and ears on not only your target audience, but also your competition.

The changing 'World of Work'

The 'World of Work' is evolving. Both in terms of where you work and when you work, more companies are providing, and the workforce is asking for, flexibility and customisation. Digital technology has shifted the way we produce and collaborate, transforming the workplace. Work itself is changing; 10 years ago, you would be hard pressed to find an SEO Consultant or an App Developer. Creativity in the workforce, once overlooked, is now one of the most sought-after skills. There is



now an onus on employers to help their workforce to adapt and reskill when needed, which in turn will produce better-skilled and more loyal employees.

MDEC is your proverbial 'captain at the helm' for the nation, which will help companies through this inevitable tide of digital disruption. With 20 years of experience in the industry, MDEC is more than happy to connect and converse with companies who want to digitally transform.

CHAMPIONING MALAYSIA'S DIGITAL ECONOMY

We are MDEC, the Malaysia Digital Economy Corporation.

Our role is to build a vibrant digital economy and ensure that Malaysia plays a leading part in the global digital revolution. We are passionate about digital technology and its potential to transform the future of our nation and the world. Through attracting technology investment, supporting local technology champions and helping Malaysian organisations and talent to embrace digital, we are fuelling a sustainable digital ecosystem that will drive the nation's digital economy forward.

MDEC. Connecting businesses and people to their digital future.



3 Internet-of-Things (IoT): A Game Changer for The New Economy

A Helmi A Halim

Sr Director,

Technology & Market Portfolio

MIMOS Bhd

The rise of IoT

Imagine the street lamps light up based on the level of visibility of the road to improve safety; the rakyat are able to participate with the police force and local authorities to combat crime; real time information of public transportation right in the palm of your hand; traffic lights that communicate with vehicles on the road to ease congested areas; real time environment early disaster warning and enhanced and efficient first response management system.

The internet, as you may very well know, is synonymous with everyday living and business. The internet today is the internet of humans, where a global network of computers enabling applications allow human-to-human communication, from accessing information on any topic, online shopping, online services and many other activities. The internet has revolutionised the way we socialise, work, and seek knowledge.

As the internet becomes ubiquitous, we are becoming more adept in exploiting the data available to us. Detailed data are required before we can react to any events. To feed the thirst for information, sensors and gateways are placed into inanimate objects or things to gather more data and information to give better insight and foresight to humans to enhance their daily operations and processes.

Ultimately, through the exploitation of science, technology, engineering and mathematics, new knowledge is created from the translated data that turns into new economic opportunity through new applications and services. In a nutshell,

anything that can be connected may well be connected! In other words, this creates ever greater linkage between the physical and cyber worlds. This is what is known as the Internet of Things (IoT)!

The growth of population, growth of global economy, and the advancement of communication technology have added pressure to existing finite resources. As a result, this has created the ideal environment for IoT technology to flourish.

Off late, there has been major IoT projects focusing on energy, water, transport, healthcare, agriculture, and government service delivery. For example, in Finland for its national energy management system, in Korea for elderly care while China employ IoT to monitor the pollution level and



control the number of cars entering major cities.

Like any groundbreaking technology, IoT enables cross fertilisation of market applications and services, resulting in the disruption of existing business models and creation of new ones such as everything-as-sharing and application-based economy.

Take the taxi industry for example, IoT has clearly disrupted the traditional taxi services from hailing the car at street curbs to just booking through your mobile from the comfort of your sofa. As IoT technology is fully embedded, new business models are creating innovative companies such as Grab Car and UBER, where traditional taxi services are displaced by ride sharing concepts.

Welcome to your future! Just to give you a feel for the scenario that is staring at us: Gartner estimates that by 2020, 26 billion devices will be connected! IoT is touted to have the potential to open up a whole horizon of opportunities for socio-economic development. Let us look at those possibilities.

The pervasiveness of IoT

A recent McKinsey study¹ estimates the total potential impact of IoT on the global economy at \$4 trillion to \$11 trillion a year by 2025. Table 1 shows the nine categories used as basis for the estimate.

The broad sweep of the potential application areas clearly shows how pervasive IoT is going to be. However, seizing these opportunities will altogether be another story. It will

mean new strategies, technologies, business models and competencies.

And there are challenges to be faced. Security is one. Greater connectivity generates a greater security threat since there are more access points. Ensuring the highest-level of security will be an ongoing exercise for all IoT system vendors.

Talking of vendors, there are as many systems in the market as there are vendors and the challenge here is in getting the systems to work together efficiently and effectively. To address this interoperability issue, open standards need to be developed, which in itself could be another challenge!

Since IoT is also about data generation and consumption, the issue of data

No.	Industry	Key Motivations & Applications of IoT
1	Manufacturing	Profitability & Productivity: Operations management, predictive maintenance
2	Public Safety	Efficiency: Public safety and health, traffic control, resource management
3	Healthcare	Monitoring and managing illness, improving wellness
4	Retail	Profitability: Self-checkout, layout optimisation, smart customer-relationship management
5	Logistics	Logistics routing, autonomous (self-driving) vehicles, navigation
6	Construction	Operations management, equipment maintenance, health and safety
7	Transportation	Safety and Cost reduction: Preventive maintenance, managing risk (insurance)
8	Homes & Office	Cost: Energy management, safety and security, chore automation

Table 1: Potential areas where IoT can generate economic value

privacy and protection comes up. How do you ensure who owns the data and that it is not misused?

Taking the bull by its horns - driving the national IoT strategic roadmap

In order to create new value out of IoT, several challenges must be addressed in order to unleash the full potential of IoT. The fear of technology adoption and information silos needs to be eliminated so as to facilitate the creation of innovative applications and services. Malaysia must garner all her resources through the support of inter-Government agencies and collaborate with industry players and academia to develop the right ecosystem for the IoT industry to flourish.

In May 2015, the Government adopted the industry set of recommendations for the National IoT Strategic Roadmap with the Ministry of Science, Technology and Innovation (MOSTI) to lead the development of IoT as a

key industry in Malaysia. We have set the vision for Malaysia to become the Regional IoT development hub, one that can create RM9.5 billion of yearly economic contribution by 2020, and RM42.5 billion by 2025.

There are several areas for us to focus on: first is to develop an IoT industry ecosystem which is conducive to stimulate the implementation of IoT technologies, secondly to strengthen the capabilities and capacities of technopreneurs in developing IoT-based applications and services, and thirdly to position Malaysia as the regional IoT development hub.

Talent is always top-of-mind in implementing any national initiative. Thus, Malaysia reckons the importance of technopreneurs and regards the industry as the helm of IoT development for Malaysia. Thus, technoprenuer development has been identified as the short-term strategy to strengthen and revitalise

Malaysian technopreneurs to participate in the global competitive arena. Technoprenuer incubation initiatives should be intensified to grow service-based entrepreneurs to harvest the 80% of IoT-driven market opportunities which gravitate towards applications and services.

Currently, many industry players are not familiar with the implementation of IoT. IoT itself is a big idea and there are many elements contributing to the realisation of the IoT concept. It is akin to a jigsaw puzzle that requires all pieces to fit together in the right way to achieve defined goals.

Seeing is believing. Therefore, the strategic roadmap has identified (but not limited to) four market segments to demonstrate the value of IoT to convince users to willingly adopt emerging technologies such as IoT.

The selection of the focus areas is premised on the strength of existing

¹ The Internet of Things: Mapping the value beyond the hype, McKinsey Global Institute.



national ICT initiatives, which provides a strong springboard for Malaysia to leapfrog towards widespread advances of IoT in the identified strategic focus areas.

Agriculture, being a strategic segment, will utilise IoT to boost income for the B40 (households in the lowest 40% of the income bracket) community by enhancing sectorial productivity while preserving national food security. Both the Healthcare and Manufacturing segments have been identified as growth segments, with the former intended to improve healthcare service delivery, and the latter with the objective of enhancing supply chain efficiency and reducing the gap between small & medium enterprises and multinational corporations as well as to stimulate innovation growth.

The transportation segment has been identified to serve community needs by improving efficiency and service levels of transport operations. The market deployment strategy is aimed at manifesting visible value and illustrating how an array of IoT-related technologies is deployed under different scenarios. This will facilitate stakeholder adoption of new solutions and reduce implementation complexities.

As mentioned earlier, technology complexities and data silo are the two main concerns that may prevent participation of local technopreneurs. Henceforth, under the 11th Malaysia Plan (RMK-11), MIMOS has developed an open technology platform to harmonise the multi standards of IoT-related technologies. The open technology platform will lower the entry barriers for local entrepreneurs

and enable local industry players to leverage and harness breakthrough convergent technologies for the development of applications and services in rapid time.

From the data sharing perspective, the key concerns are the protection of personal data privacy and the commercial rights of data owners, which can be alleviated through the open technology framework. The framework will be embedded with mechanisms to preserve data privacy and security for both users and enterprises.

Through the open technology platform, the industry will be able to cross develop new solutions that work seamlessly across a wide range of applications with flexibility, scalability and compatibility. Consequently, this framework provides a competitive

advantage and new opportunities for Malaysian technopreneurs to diversify and expand revenue streams.

Furthermore, strategic and active promotion of the Malaysian ecosystem via various government agencies; e.g. the Malaysian Global Innovation Centre (MaGIC), Malaysia Digital Economy Corporation (MDEC), Malaysian External Trade Development Corporation (MATRADE) and the Malaysian Industrial Development Authority (MIDA) will generate demand which in turn will broaden the market beyond Malaysia. We could position the Malaysian IoT ecosystem as the IoT value-based partner of the world to create new economic value and new jobs for Malaysia.

Looking ahead, consumers, the government and businesses are moving inevitably towards the IoT. While we are concerned about information security and privacy,

information storage and management and the digital divide, it is imperative that the growth of IoT in Malaysia occurs within an ecosystem driven by key strategic thrusts that establish a framework for its endeavours.

The enablers will harness the intrinsic values of the three strategic thrusts towards the institutionalisation and recognition of Malaysia as the premier regional IoT development hub.

Towards a matured IoT ecosystem

To create IoT-based industries and develop a concomitant vibrant ecosystem, there must be systemic planning and monitoring. As mentioned in the previous section, the government is promoting IoT via pilot activities in several economic sectors. These pilots are in line with what industry pundits are saying – that applications and services will grab the lion’s share of the IoT economy.

In other words, the value of IoT lies in transforming data streamed from smart devices into information and knowledge for increasing efficiency and productivity. This implies that IoT activities for identified lucrative market sectors must be planned such that there is growth towards becoming sustainable industries where industry progress and performance could be tracked.

In view of this, MIMOS has developed an IoT Innovation Maturity Model for planning and performance monitoring purposes to gauge the performance of the local IoT industry (Table 2).

The data-driven model consists of five levels of maturity – Level 0 to Level 4. Briefly, they are:

- Level 0 – comprises technology and activities related data storage to deliver standalone functions;
- Level 1 – comprises technology and

Maturity Level	Data Stage	Technology Capability	Value Created	Example (Taxi Industry)
Level 0	Data Storage	<ul style="list-style-type: none">▪ ‘Digitisation’ of data▪ Organisation of data	Structured databases	Organised radio taxi services
Level 1	+ Data Collection	<ul style="list-style-type: none">▪ Connected devices▪ Continuous data gathering	Smart sensor-based and machine-to-machine applications	Satellite-driven taxi services (Airport Limo S/B)
Level 2	+ Data Processing	<ul style="list-style-type: none">▪ Data integration from multiple sources▪ Secured applications	Specific applications accessible via smart connected devices	Taxi booking applications (Easy Taxi)
Level 3	+ Data Mining	<ul style="list-style-type: none">▪ Data harvesting▪ Data pattern identification	End-to-end scalable systems based on full value-chains	Option services (Grab Taxi)
Level 4	+ Data Analytics	<ul style="list-style-type: none">▪ Predictive and prescriptive data analysis▪ Unified intelligent solutions	High value intelligent “*-as-Service” solutions founded upon integrated multiple systems, scalable to regional and global levels	Globally available “Mobility-as-a-Service” (MaaS) solution (Uber)

Table 2: MIMOS IoT Innovation Maturity Model

activities related to data storage and collection to deliver machine-to-machine communication;

- Level 2 – comprises technology and activities related to data storage, collection and processing (information classification) to deliver applications accessible via smart devices ;
- Level 3 – comprises technology and activities related to data storage, collection, processing and mining (pattern identification) to deliver value chain based end-to-end scalable systems; and,
- Level 4 – comprises technology and activities related to data storage, collection, processing, mining and analytics (predictive and prescriptive) to deliver “*-as-Service” solutions.

You will notice that as you move from Level 0 to Level 4, the growth in maturity is reflected in the increased complexity and ‘intelligence’ of the applications. Therefore, the economic value creation is also higher.

Figure 1 illustrates graphically how IoT has transformed the Malaysian taxi industry, the example cited in Table 2 earlier. Needless to say, the above example is based on hindsight and therefore easy to map onto the innovation model. In the case of market sectors we want to transform, the challenge will lie in designing and mapping such industry

transformation prior to implementation and seeing the implementation through.

IoT opportunities – strategic economic sectors

The National IoT Roadmap has identified four sectors for IoT intervention based on the potential for socio-economic growth. These sectors are Agriculture, Healthcare, Manufacturing and Transportation.

The impact of IoT on the sectors would be clearer if we view them through the ‘innovation (activity) value-chain’ lens viz.: components/products (upstream); systems (midstream); solutions (downstream) and services.

Table 3 summarises the IoT opportunities along the ‘activity value chain’ for the aforementioned four sectors.

Using value-chain analysis to deep-dive and identify innovation opportunities is the first step. The next step is to realise the full potential of identified opportunities.

Recall that the value of deliverables increases as we move for Level 0 to Level 4 of the Innovation Model. Thus, to reiterate, you reap the greatest value at Level 4.

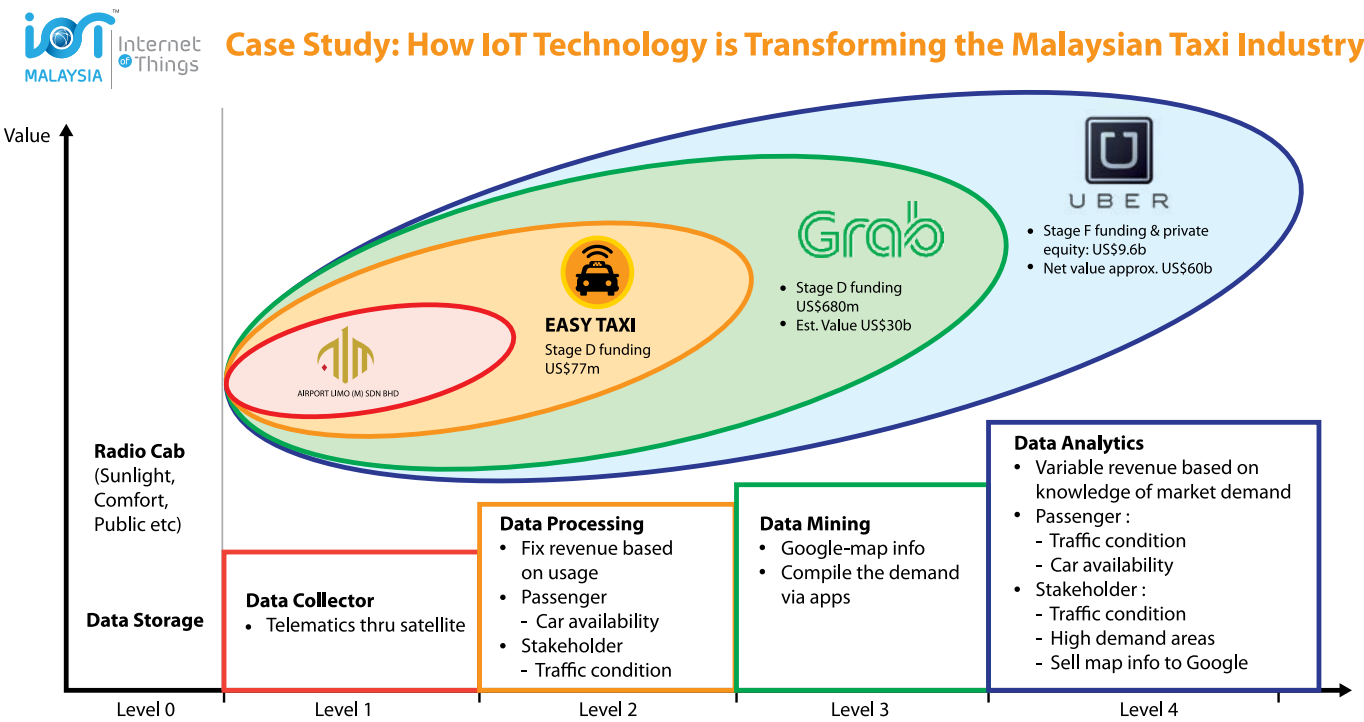


Figure 1: Mapping the IoT disruption in the taxi industry

Sector	Upstream	Midstream	Downstream	Services
Agriculture	<ul style="list-style-type: none"> Intelligent Farming Remote Farm Monitoring 	<ul style="list-style-type: none"> Traceability Certification Logistics Management 	<ul style="list-style-type: none"> eMarketplace Customer Management Demand Management 	<ul style="list-style-type: none"> Agriculture ERP Supply Chain Management Management of Input Farm Extension Service Agriculture Analytics Price Management Contract Farming
Healthcare	<ul style="list-style-type: none"> Integrated Clinical System Health Tourism 	<ul style="list-style-type: none"> Drug Traceability Certification Medical Support System 	<ul style="list-style-type: none"> eConsultation Self-Diagnostics Wellness 	<ul style="list-style-type: none"> Electronic Medical Records Insurance Remote Patient Monitoring Medical Knowledge Base Emergency Response System National Health Database
Manufacturing	<ul style="list-style-type: none"> Inbound Logistics Production floor Monitoring 	<ul style="list-style-type: none"> Outbound Logistics Certification Traceability 	<ul style="list-style-type: none"> Customer Order Management Order Prioritisation 	<ul style="list-style-type: none"> Connected Supply Chain Remote Asset Management Smart Energy Management Proactive Maintenance Product Lifecycle Customer Lifecycle
Transportation	<ul style="list-style-type: none"> Route Planning & Control Asset Monitoring 	<ul style="list-style-type: none"> Integrated Services Management Traffic Management 	<ul style="list-style-type: none"> Integrated Ticketing Route Advisory Passenger Info System 	<ul style="list-style-type: none"> Connected Supply Chain Remote Asset Management Smart Fuel Management Proactive Maintenance Customer Experience Management Value Add services

Table 3: IoT opportunities in Agriculture, Healthcare, Manufacturing and Transportation sectors

And you do this by developing service-oriented business models ala the Software-as-a-Service (SaaS) model. Instead of selling printers, you sell 'printing-as-a-service'; instead of washing-machines, you sell 'washing-as-a-service'; and going further, instead of jet-engines, you can even sell 'power-as-a-service. The central idea is instead of selling a one-off product, you stay engaged with your customer on a continuous basis so as to identify new needs to be fulfilled, thereby expanding your business.

Jahangir Mohammad, CEO of Jasper puts this succinctly: *"The IoT business is about transforming static product businesses into dynamic service businesses."*²

Way forward

Recognising the potential and impact of IoT on the New Economy, the government has taken several forward-looking initiatives to ensure Malaysia is not left behind as the rest of the world races to exploit this new opportunity for socio-economic development.

The challenges facing Malaysia in this context would be:

- Implementing the plans it has put in place – not just pay lip service!
- Bringing all stakeholders to a common understanding and purpose – break existing silos!
- Building a viable ecosystem for synergistic delivery of products and solutions – no unsustainable ad hoc activities!
- Innovating new service-oriented business models – no more 'more-of-the-same'; and,
- Developing new capabilities and competencies – trust homegrown talents to deliver!

Remember, IoT will definitely hit Malaysian shores. We can be just the consumers or we can participate and reap the economic benefits of IoT. If the above challenges are tackled sincerely, you can be sure Malaysia can be a key player in this evolving IoT global game!

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¹Source: WW Quarterly Server Tracker, 2016 Q2 Historical Release, September 14 2016.

²Source: IDC WW Quarterly Enterprise Storage, March 2016. EMC is #1 in external storage and total storage.

³Source: Based on Dell / EMC / VCE aggregate revenue, March 2016.

⁴Source: Based on Dell / EMC aggregate revenue, April 2016.

⁵Source: IDC Tracker. "Worldwide Quarterly Enterprise Storage Systems Tracker." June 2016.

4 Disruptive Technology to Spur Economic Growth

Fusionex

Disruption – the word has been bandied about, by techno-marketers claiming a product would replace everything you’ve owned, or by entrepreneurs hawking an idea which would supposedly revolutionise the way you live. But what does it mean to be truly disruptive?

In a changing world that becomes less familiar with every year that passes, we’ve seen social media platforms in vogue one moment and shutter the next. We’ve also seen technologies rise in prominence only to phase out and be replaced by newer, shinier hardware.

A recent write-up by Gartner stated that disruption “has moved from an infrequent inconvenience to a consistent stream of change that is redefining markets and entire industries.” But before we talk about how change is now a 24/7 thing and we are being disrupted every waking moment of our lives, let’s take a short walk down memory lane to a recent saga of disruption in online media – the video.

Disruption cut short

As more people become connected thanks to ubiquitous mobile gadgets and are introduced to high-speed internet, viewership of online videos has boomed. A Statista report found that in 2015 the number of digital video viewers in the US surpassed 200 million. Online video penetration was found to have reached 95.9% in South Korea, 84.1% in India, and 77% in Brazil.

The public’s consumption of online media became more video-heavy with the launch of video-hosting sites Vimeo in 2004 and YouTube in 2005. One interesting online video service which gained prominence recently was Vine. Allowing its users to post six-second videos, Vine enjoyed brief popularity in today’s world, one that demands quick and brief media consumption.

The service quickly gave birth to its own coterie of “Vine stars” – ordinary members who racked up millions of views on the platform due to their creative and often humorous uploads. However, the notoriety Vine gained was short-lived – parent company Twitter decided to pull the plug on the platform in October 2016, about three years after Vine’s 2013 launch.

In those three years however, several competing video services came into being. Instagram, the photo-hosting service already enjoying massive success in member recruitment since its start in 2010, launched its own video-hosting capabilities about six months after Vine’s inception. It also launched its own version of looped video called Boomerang in October 2015. Live-streaming video platform Periscope launched in 2015. Most



Allow data to craft strategies.

recently, Facebook launched its live video feature in April 2016.

While Vine was one service that became victim to an increasingly competitive industry, the survivors that were left had a growing user base of hundreds of millions. One survivor of the online video tussle, Snapchat, was recently reported as having advertising revenue that stands to reach USD1 billion by 2017.

So, what is to be learnt from this online video saga? Increasingly-fast internet resulted in more video viewers across the world and it took a disruptive force such as Vine, with a reported 200 million monthly views in its heyday, to spur more established industry players towards increasing their rate of online video adoption.

The success disruptors enjoy during the initial phase of disruption can be manifold but in this digital era, anything can be repeated in a short period of time – similar competing features can easily be launched especially by players who have resources and expertise on hand.

Maintain trajectory by leveraging data

In their search for growth and increased profitability, how can organisations disrupt their respective industries, corner their own market, edge out the competition, innovate, and maintain this trend of success ad infinitum? They’ll need something that can leverage on existing technologies – Vine was hardly a pioneer as internet video has existed since the late 1990’s.

They will also need something that anticipates what customers really want – again, Vine’s catering to people wanting quick and short media consumption. And finally, organisations need something which can predict what the future holds, taking into account moves being made by the competition and the general atmosphere of the industry, in order to evolve, adapt, and last.

Enter Big Data Analytics (BDA). Hardly a new concept as the first mention of “Big Data” was attributed to an Association for Computing Machinery article published in August 1999 where its writers called the advancement in computing power a blessing and a curse – “Understanding the data resulting from high-end computations is a significant endeavor... it is just plain difficult to look at all the numbers.”



Disruptive digital technologies serve to make our lives easier and more convenient.

But BDA has proven to be invaluable in boosting the productivity and efficiency of organisations across the globe. One US restaurateur employed BDA to analyse data from its point-of-sale (POS) systems, promotional campaigns, customer feedback and stocks. Using near real-time analysis, the company could modify its operations to enhance its inventory, ensuring its branches never ran out of stock or experienced an oversupply.

An Australian telecommunications company used BDA to trawl through its network data to create specific sets of operational standards. Using real-time analysis of data, the company would be alerted should any dip in network quality be noted and the system it uses is intelligent enough to recommend remedial actions to be taken.

These are some anecdotes as to how BDA has been used by companies to overhaul the way they've been operating in order to be more efficient. This will hold them in good stead when competing against less data-reliant companies which are slower to react to changes in the market.

Probably the most glaring disruption in recent memory is how ride-hailing mobile app Uber has been to the world's taxi industry. The company heavily relied on location-based data to match drivers with the closest passengers and also predictive analytics to determine the best routes for its rides with regards to traffic conditions.

The company even crunched data to determine prices – less drivers on

the road (compared to passengers requesting for rides) results in "surge pricing" where prices are hiked in order to attract more drivers to hit the streets.

Will these strategies reward Uber in the long term and see it continue growing as the go-to option for transportation? While some regulatory bodies have clamped down on the app to protect their domestic taxi industries, the disruptive company should continue to enjoy worldwide success if it continues to make data-driven decisions.

Economic growth via data disruption

Harnessing dormant data, delving into the gritty details, and emerging with impactful insights – all have the opportunity to make life better for



Predictive analytics determines the best routes.

everyone. But how does this translate to growing the economy – not only giving everyone their fair share of the pie, but growing the size of the pie as well?

Disruptive technologies such as Mobile Internet, the Internet of Things (IoT), and the Cloud were said to have the ability to influence every aspect of our lives going forward. According to the McKinsey Global Institute, Mobile Internet could potentially generate an impact of USD11 trillion on the economy in 2025 and save up to 20% of treatment costs for patients with chronic diseases.

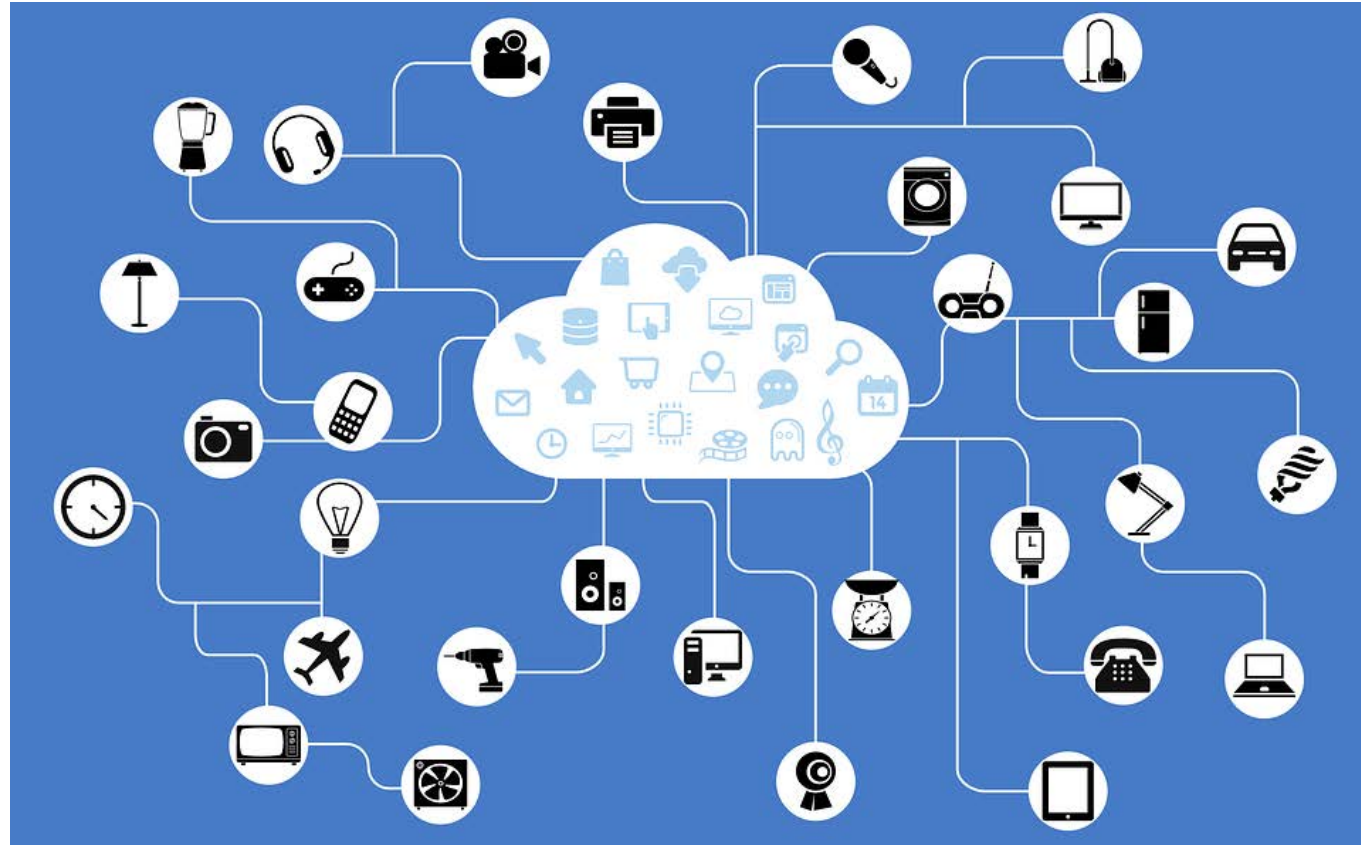
This is due to the monitoring of patients' health remotely, gathering all manner of bodily data from heart rates to amount of breaths, and body temperature. All this is, in turn, a demonstration of how integral sensor data from the IoT are. Healthcare professionals would then be able to track how their patients are doing, be notified if any downward data trends are picked up by their monitoring system, and carry out preventive medical care before any untoward health episodes occur.

The research group also estimated that the IoT, thanks to affordable sensors and wireless RFID devices, "offers potential to drive productivity across USD36 trillion in operating costs of key affected industries: manufacturing, healthcare, and mining." The ability to trim costs and optimise business processes can be realised when companies in industries such as logistics use natural resources efficiently.

Additionally, the Cloud, which provides information and services wirelessly such as over the internet, could increase productivity up to 20%, thanks to high-speed networks.

Future-proofing

What then should organisations do in order to make the most out of data-enabled technology and possibly be disruptors themselves? Challenging the status quo will be difficult. Changing corporate policies which have been advantageous in the past, retraining employees, and reinvesting in newer technologies all sound like a pain – if only in the short term.



By working with their clients, Fusionex and other BDA companies are working towards the most effective and applicable solutions to future-proof their businesses before other competitors, or changing technology, threaten to pull the rug from under them.



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5 The BIG Deal

Accelerating BDA Adoption &
Developing The Local Industry

PIKOM in collaboration with MDEC

Here's some food for thought: technology and in particular digital technologies are evolving at such a rapid rate that the window period to adopt and harness their transformative powers is increasingly shrinking.

What this means is that late adopters may find themselves relying on technologies that are already being superseded by new and much more effective digital tools to carry out the same tasks. These laggards will be one - or worse yet - two to three innovations behind their competitors vying in the same or other markets.

In a foot race, those left far behind become irrelevant as almost all eyes would be fixed on the frontrunners. Think Usain Bolt at the 2016 Olympics 100m final. So who came last? Trayvon Brommel, but who can remember, or even care to?

Likewise in business, trailing companies or ventures invariably slide into obsolescence, rarely to be seen or heard of again. Think Motorola, NEC and Sony Ericsson in the mobile phone market, or Wii in the console games arena.

If you can't compete, you might as well shut up shop. It is a scenario that hangs like a shroud over many businesses and industries. And we're not merely talking about those companies or sectors at the cutting edge of technology, but also many traditional brick and mortar ventures that can no longer stay outside the fringes of the digital revolution. After all, we only need to look at the flailing fortunes of the conventional taxi industry in a market invaded by Uber and Grab.

Today, the digital technology primed for widespread adoption is 'big data analytics', or BDA as coined within Malaysia. While everyone has a general idea or understanding of BDA, perhaps the most simplistic and convenient way is

to describe it as technologies that integrate, organise, manage, analyse and present data critical to decision making.

What's the big deal?

Globally, BDA is increasingly being tapped by businesses and industries as well as by governments, civil society, and political organisations – as was evident during the recent US Presidential Election.

In that instance, data analytics were churning out the results and painting multiple scenarios in real time what would have taken many minutes if calculated and permutated by humans and their basic computing tools. For example, BDA was able to instantaneously determine the progressive probability of Donald Trump winning the State of Florida at every stage in the entire running tally



Economies like Singapore, Australia and Hong Kong are streets ahead in terms of BDA adoption.

of votes, based on what had already been counted and what was left to be counted.

Yet in Malaysia, we are apparently slower on the uptake than others. According to global market intelligence firm IDC, we continue to lag behind other developed economies like Singapore, Australia and Hong Kong in the APEJ (Asia Pacific excluding Japan) region.

In a study conducted for the Malaysia Digital Economy Corporation (MDEC) in 2014, IDC placed Malaysia at the earliest stages of BDA adoption, noting that usage was generally confined to large companies in the financial and telecommunications sectors which on their own generated large amounts of data that could be mined and analysed. By inference, this meant that BDA usage among the nation's small and medium-sized enterprises (SMEs) was minimal at best.

The research house however, mentioned that demand was picking up

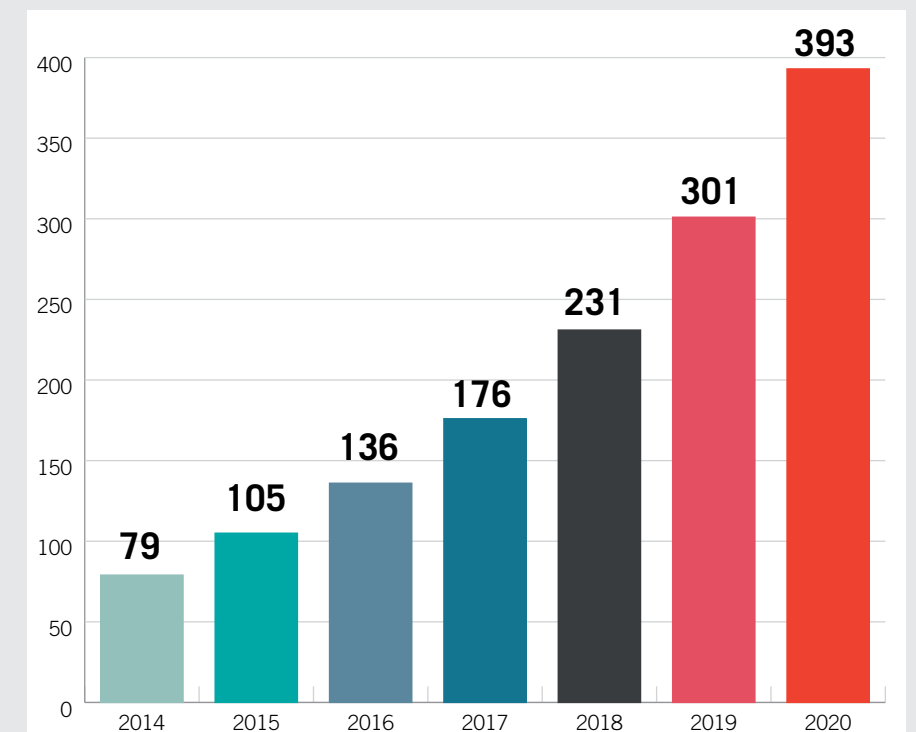


Figure 1: BDA market forecast for Malaysia (2014 – 2020 in RM million) by IDC

in the retail sector. IDC also forecasted that demand for BDA in Malaysia would almost quadruple from RM105 million in 2015 to RM393 million by 2020, as shown in Figure 1.

BDA recognised as pillar of Malaysia's digital economy

Against this backdrop, it should be noted that as early as 2014, the Malaysian Government had acknowledged

the potential of BDA as a key and indispensable pillar of the nation's digital economy. As a consequence, it has moved decisively and rapidly to ensure Malaysia would not fall behind others for too long.

In 2014, the Government endorsed efforts to establish Malaysia as a BDA hub in the ASEAN region. Just to give an idea of BDA's prominence, there are currently no less than three Government or government-linked agencies that have launched BDA initiatives and they include MDEC, the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) and the National R&D Centre in ICT (MiMOS).

As the agency entrusted to develop, coordinate and promote Malaysia's digital economy, MDEC launched the National BDA Framework to accelerate BDA adoption in both the private and public sectors.

MDEC is also poised to launch the ASEAN DataAnalytics Exchange (ADAX) as a one-stop hub for the creation and adoption of BDA. Essentially, ADAX acts as a platform to showcase BDA technologies, pilot use cases in ASEAN as well as to facilitate the development of start-ups and talents.

To complement these efforts, PIKOM has on its own accord formed a Big Data Special Interest Group (SIG) as a platform to integrate BDA adoption among the Government, businesses and the ICT community as well as to promote general awareness of BDA across industry and society.

Partly as a result of these initiatives and efforts, domestic perception of BDA has surely but steadily shifted from "What's the big deal?" to "It's a big deal!", and is



now gradually moving towards "How can it help me to get the big deals?"

That last poser has become a primary challenge faced by developmental agencies and related promotional bodies like MDEC and PIKOM. It is this issue that will ultimately determine whether adoption can be achieved across business and industry at an acceptable pace before the next innovation cycle for BDA and related technologies.

Driving adoption and developing the industry

In an attempt to address this challenge, MDEC recently carried out a BDA landscape study focussed on reviewing efforts to drive adoption, and to develop industry players. For the latter objective, the study developed a framework to profile existing BDA players in Malaysia and outlined the market opportunities in three specific regions: ASEAN, Asia Pacific and the World.



The study found that the overriding constraint in the drive toward adoption was a persistent lack of in-depth understanding of what BDA could do and how it could help generate higher returns for businesses and industries. The majority of would-be BDA adopters and users were simply unable to see how they could derive real value from the utilisation of BDA in their operations or processes.

This is hardly a surprise and the same can probably be said of many other new and emerging digital technologies. As with many things, the issue is first and foremost a marketing problem. After all, the mission to drive adoption ultimately rests on two main tasks: Marketing and Matchmaking.

In this case, there was no meeting of minds between the suppliers

and the consumers. In a nutshell, conversations between both parties were lost in translation. The suppliers as a whole could not convince the consumers of the tangible benefits of BDA while the consumers, more often than not, weren't really sure what the suppliers were talking about.

In the simplest marketing terms, BDA suffers from a lack of buy-in and has not been able to convince a large-enough or diversified-enough base of consumers of its potential.

If we were to look at this from the four loose stages of consumer buy-in – Awareness, Understanding, Need and Action (see below) – the bulk of Malaysian businesses are still somewhere between Awareness and Understanding. Most aren't anywhere near the third stage where the impetus for purchase takes off.

1. AWARENESS of what it is or does;
2. UNDERSTANDING what it can do for them;
3. Feel the NEED to buy;
4. Take ACTION to buy and apply.

On this point, the study pointed out a series of related gaps and issues before outlining some recommendations going forward, as follows:

- Issue:
 - Prospective buyers or users lack sufficient understanding of potential and scope of BDA and how to derive real and tangible value from it.

Recommendations:

- BDA solutions should be clustered into easily-understood packages.
- The costs of BDA solutions should be juxtaposed against the value derived from adoption and usage.

- Issue:
 - Interest in BDA has yet to spread across industries and SMEs.
- Recommendation:
 - Marketing of BDA should shift to SMEs and all other industries to catalyse mass adoption.

- Issue:
 - BDA products and services are mainly categorised from a supply-side, industry-specific perspective.
- Recommendation:
 - Clustering of solutions should incorporate a demand-centric point of view.

The study also highlighted the importance of developing a uniform set of BDA solution clusters, one which would be clear to both BDA solution providers and their prospective buyers. This has its merits since two parties are more likely to see eye to eye if they use a common set of references.

Additionally, it was recommended that BDA solutions be mapped to business imperatives in order to generate demand-centric clusters that make more sense to potential business users.

Developing a set of uniform BDA solution clusters

The attempt at uniformity in clustering BDA solutions met with some interesting challenges. There were so many different classifications floating around from companies and organisations including research houses. One thing was clear. No one seemed to agree on anything.

Some broke down BDA into three distinct components, that of Software, Hardware and Services (business consulting, IT-related services). Others segregated BDA technologies into segments of Data Mining, Data Processing, Data Analytics and Interface or Visualisation Tools.

There were also those who defined BDA according to their functions of Consumer Insight, Marketing Insight, Resource Optimisation, Security & Intelligence, Process Analysis, Talent Management and much, much more.

In the end, MDEC collected and collated the different categorisations and produced a matrix of supply side clusters, as featured in Figure 2. As illustrated, the matrix groups BDA into horizontal Components (Software, Hardware, Services) and vertical Segments of Data Mining, Data Processing, Data Analytics and Interface or Visualisation Tools.

From the outset, it was understood that the Software Component was the natural driving force of BDA. In other words, growth in Software would invariably stimulate growth in Hardware and Services, but not necessarily the other way round.

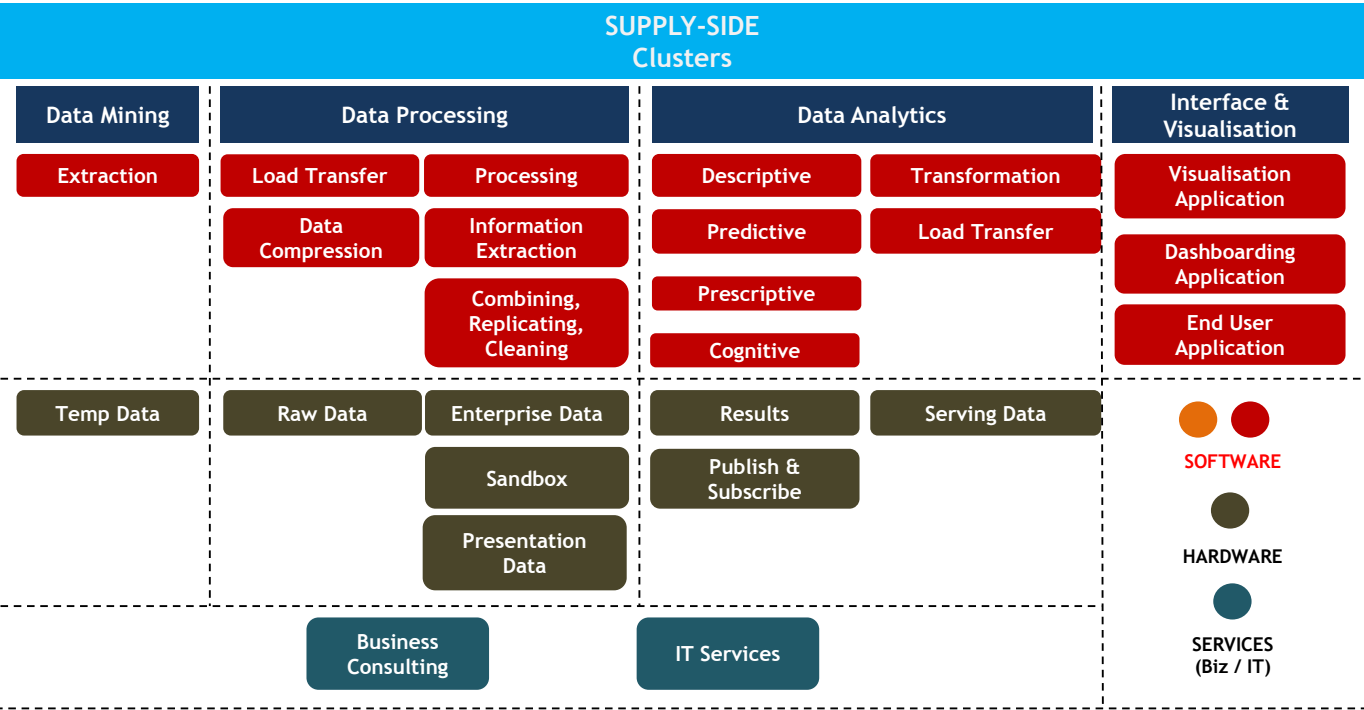


Figure 2: Supply-Side Clusters of BDA Solutions, Products & Services



Similarly, the core of BDA Software rests in its Data Analytics, which after all, forms part of the acronym. Again in this case, Data Analytics is the main reason why anyone would mine and process data, and develop visualisation tools.

Here again, Data Analytics come in many different maturity levels or complexity of capability. Some organisations and research houses categorise them into three levels, others four and some even five. For the purpose of clarity, MDEC settled on four maturity levels and adopted a clear and distinct definition for each.

They are as follows:

1. Descriptive
 - Determines 'What HAS happened?' Provides insight

into the past via data mining and data aggregation.

2. Predictive
 - Determines 'What could happen?' Provides better understanding of the future with statistical models and forecasting techniques.
3. Prescriptive
 - Determines 'What CAN we do?' Offers advice on possible outcomes through optimisation and simulation algorithms.
4. Cognitive
 - Determines 'What SHOULD we do?' Indicates the best course of action with the aid of artificial intelligence applied to historical and real-time data, trends and behaviour.

Following this step, MDEC then looked at mapping Data Analytics to demand factors in business. For any business, the three main imperatives are straightforward, as follows:

- Increase revenue
 - Drive sales volume
 - Capture new customers
 - Retain existing customers
 - Expand market footprint
- Reduce cost
 - Manage supply chain
 - Manage inventory
 - Optimise operations
 - Prevent fraud
 - Manage risks
- Improve productivity
 - Enhance physical processes
 - Raise human resource output

The mapping exercise produced demand-centric clusters comprising Types of Analytics Functions, as shown in Figure 3:

The clustering of BDA solutions then enabled MDEC to develop a framework to profile local BDA companies and start-ups.

Profiling local BDA companies

In the last couple of years, groups of ICT companies have extended their offerings to include BDA solutions. At the same time, BDA start-ups have also come to the fore. As with any new industry cluster, not much is known of the depth and breadth of these companies.

In order to gain greater clarity in this area, MDEC is conducting a survey of all known BDA companies with MSC

Malaysia status as well as non-MSC ventures. The profiling framework was developed for this very purpose.

The framework (See Figure 4) seeks to streamline the profiling into five levels that could determine the following:

- general details of the company
- BDA category
- supply-side clustering
- demand-centric clustering
- potential

Once the profiling of the local BDA industry is completed, MDEC aided by PIKOM, would be in a position to match local players with domestic, regional and even global opportunities and these are extensively detailed in the sidebar article: “Market Opportunities in BDA across Three Regions” in the following pages.

Key takeaways on market opportunities

A brief look at the market opportunities for BDA companies highlights several trends and prospects.

The first is that BDA demand in ASEAN is still at the nascent stage despite the fact that the region is the fastest growing market compared against Asia Pacific and the rest of the world. Nevertheless, this opens the door to smaller to medium-sized BDA players to exploit, especially with the imminent opening of ADAX in Bangsar South, Kuala Lumpur.

Secondly and as expected, data analytics as a segment of the software component of the BDA industry is primed to be the fastest mover and this offers good news for companies that are providing hardware or consulting

DEMAND-CENTRIC Clusters	
Business Imperatives	Types of Analytics Functions
Increase Revenue <ul style="list-style-type: none">• Drive sales volume• Capture new customers• Retain existing customers• Expand market footprint	<u>Consumer insight</u> Individual profiling, Purchasing trends, Marketing impact <u>Market insight</u> Market profiling, Purchasing trends, Marketing impact
Reduce Cost <ul style="list-style-type: none">• Manage supply chain• Manage inventory• Optimise operations• Prevent fraud• Manage risks	<u>Resource optimisation</u> Supply chain analysis, Inventory analysis, Operational efficiency <u>Security & intelligence</u> Fraud detection, Risk analysis
Improve Productivity <ul style="list-style-type: none">• Enhance physical processes• Raise human resource output	<u>Resource planning</u> Process analysis, Talent management

Figure 3: Demand-centric Clusters of Types of Analytics Functions

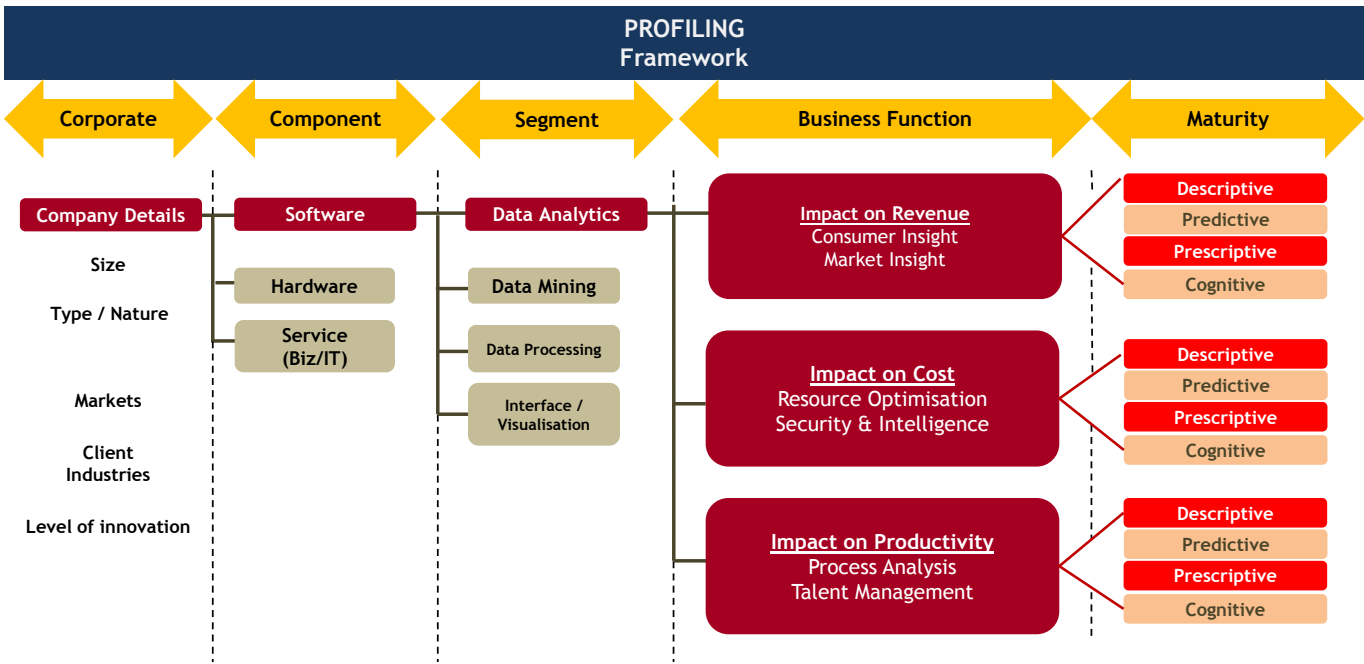


Figure 4: Profiling Framework of Local BDA companies

and IT services. After all, growth in analytics software will naturally generate demand for more hardware, or consulting / support services.

It should also be noted that consumer analytics and supply chain analytics will increase in demand in the years

to come. At this stage, demand for consumer analytics are concentrated in a select few industries or sectors such as retail, financial services and telecommunications.

What this means is that there is scope to grow demand in other industries

going forward. As such, this is the task facing MDEC and PIKOM: How to generate demand for BDA across all other industries and economic sectors.

Perhaps, we will know faster if we use analytics to figure that out!

Market Opportunities in BDA across Three Regions

A market forecast was recently conducted by MDEC to outline opportunities in the BDA market across three regions: Global, Asia Pacific and ASEAN. The forecast covered a six-year period between 2015 and 2020 and was collected and collated from market intelligence reports by IDC and Mordor Intelligence based in Hyderabad, India.

The exercise covered the following areas according to the supply-side and demand-centric clustering of BDA products, services and solutions:

- BDA markets as a whole;
- Regional markets for BDA Software (the other two components being Hardware, and Services: Business & IT)
- Regional markets for BDA Software Segments (Data Mining / Processing, Analytics, and Interface / Visualisation Tools)
- Regional markets for Types of Analytics (Consumer, Market, Risk, and Supply Chain)

BDA markets

The global market for BDA is forecast to grow beyond US\$200 billion by 2020 from US\$120.46 billion in 2015, expanding more than 70% over the 5-year period at a compound annual growth rate (CAGR) of 11.3%.

In the same period, the respective markets for Asia Pacific and ASEAN are projected to effectively double in size, with the Asia Pacific and ASEAN markets worth a projected US\$44.09 billion and US\$6.16 billion by 2020, as shown in Table 1.

It is interesting to note that the current ASEAN market for BDA constitutes only a fraction of the world market. Demand in ASEAN contributed only 2.6% to the global market and 13.4% to the Asia Pacific market in 2015. Meanwhile, the Asia Pacific market constituted 19.2% of the total market, as shown in Figure 5.

However, the respective CAGRs for both these markets in the period 2015 – 2020 are higher than the corresponding global CAGR, with ASEAN the highest at 14.9% and Asia Pacific at 13.7%.

Regional markets for BDA Software

The market for BDA Software is forecast to grow faster than the other two components of Hardware and Services:

	2015	2016	2017	2018	2019	2020	CAGR
Global	120.46	131.75	146.04	164.16	183.44	205.62	11.3%
Asia Pac	23.14	25.82	29.28	33.65	38.43	44.09	13.7%
ASEAN	3.09	3.47	3.97	4.61	5.32	6.16	14.9%

Table 1: BDA Market 2015 – 2020 (in USD billion)

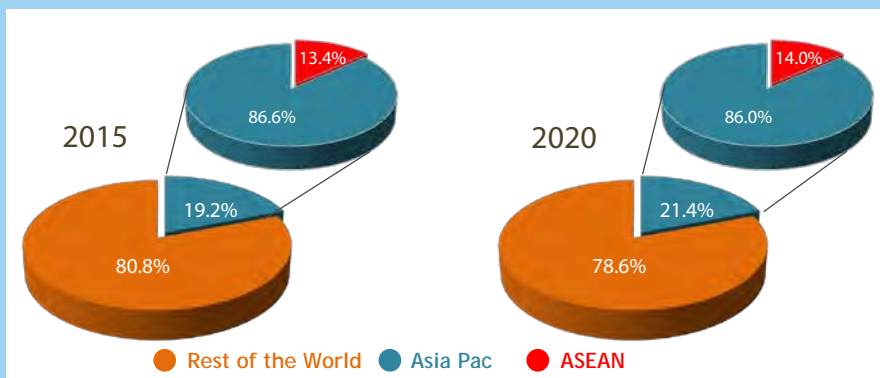


Figure 5: BDA Market Share by Region

	2015	2016	2017	2018	2019	2020	CAGR
Global	35.16	39.22	44.35	50.46	57.94	65.66	13.3%
Asia Pac	7.51	8.50	9.78	11.29	13.16	15.16	15.1%
ASEAN	1.02	1.15	1.35	1.57	1.85	2.15	16.3%

Table 2: BDA Software Market 2015 – 2020 (in USD billion)

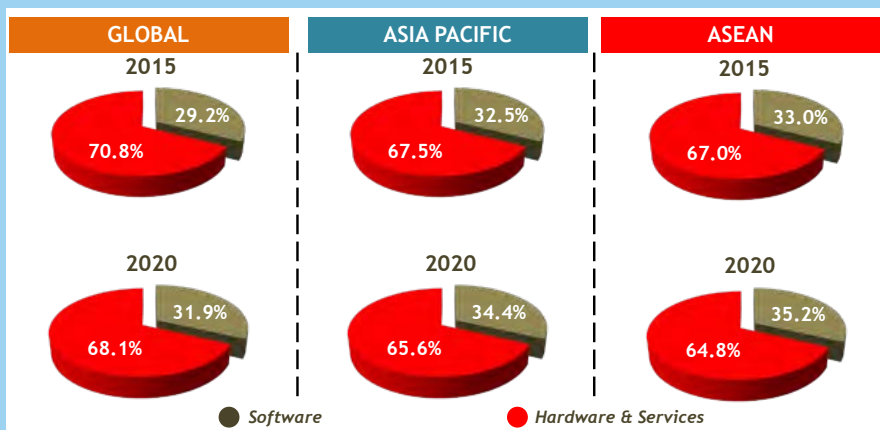


Figure 6: BDA Software: Share of total BDA market in respective regions

Business & IT, as reflected by the higher CAGRs against the respective CAGRs for the total BDA market.

ASEAN has the highest CAGR for BDA Software at 16.3%, with the market expected to grow from US\$1.02 billion in 2015 to 2.15 billion by 2020. The respective Asia Pacific market is also

forecast to expand by a CAGR of 15.1% in the same period to reach US\$15.16 billion by 2020, as shown in Table 2.

As can be seen in Figure 6, the Software component makes up roughly a third of the total BDA market. It can also be seen that Software's market share is poised to inch its way up over the next few years.

By 2020, Software will comprise 35.2% in ASEAN, 34.4% in Asia Pacific and 31.9% of the global BDA market.

It is pertinent to bear in mind that growth in Software will naturally result in growth in the Hardware and Services (Business & IT) components.

Regional markets for BDA Software segments

As mentioned earlier, BDA products, services and solutions can be clustered into four segments of Data Mining, Data Processing, Data Analytics, and Interface / Visualisation Tools. For ease of calculation, however, MDEC has grouped Data Mining and Data Processing together.

From Table 3 and Figure 7, it is clear that Data Analytics is the largest as well as the fastest growing segment of the BDA Software market. This is to be expected since analytics is the *raison d'être* for the BDA industry.

Data Analytics is projected to make up an estimated 60% of the BDA Software market across all three regions by 2020, following the projected CAGRs of 17.2%, 15.9% and 13.9% respectively for ASEAN, Asia Pacific and the world.

Regional markets for types of Analytics

Although there are other types of analytics, only the main demand-centric clusters that could impact business revenue and operating costs were taken into consideration. These are: Consumer Analytics, Market Analytics, Risk Analytics and Supply Chain Analytics.

Referring to Table 4, it comes as no surprise that Risk Analytics is currently the predominant type, comprising 70.1% of the global Data Analytics market in 2015 although it is expected to lose some market share by 2020 (67.7%). After all, Risk Analytics has been in use for quite some time particularly in the finance and financial services industries for purposes such as approving loans, issuing credit cards and insurance policies. It is already an established market dominated by traditional analytics solution providers.

However, Consumer Analytics is the fastest growing type, as reflected by the highest CAGRs in their respective categories. Although relatively small, its market share of the global Data Analytics market is projected to grow from 9.4% in

Data* Mining Data Processing		2015	2016	2017	2018	2019	2020	CAGR
	Global	9.88	11.01	12.51	14.44	16.43	18.77	13.7%
	Asia Pac	2.22	2.50	2.88	3.36	3.85	4.44	14.9%
Data Analytics		2015	2016	2017	2018	2019	2020	CAGR
	Global	20.78	23.33	26.52	30.21	35.06	39.90	13.9%
	Asia Pac	4.38	5.00	5.78	6.69	7.90	9.16	15.9%
Visualisation Applications		2015	2016	2017	2018	2019	2020	CAGR
	Global	4.50	4.88	5.32	5.81	6.45	6.99	9.2%
	Asia Pac	0.91	1.00	1.12	1.24	1.41	1.56	11.5%
		2015	2016	2017	2018	2019	2020	CAGR
	Global	0.120	0.133	0.151	0.170	0.194	0.217	12.6%
	Asia Pac	0.120	0.133	0.151	0.170	0.194	0.217	12.6%

Table 3: Market for BDA Software Segments 2015 – 2020 (in USD billion)

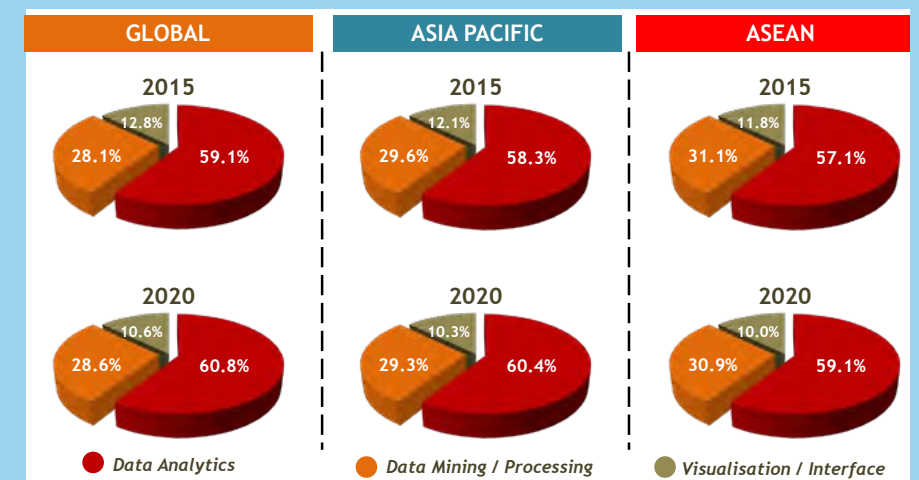


Figure 7: BDA Segments: Share of total BDA Software market in respective regions

Consumer Analytics		2015	2016	2017	2018	2019	2020	CAGR
	Global	1.95	2.24	2.71	3.27	4.14	4.89	20.2%
	Asia Pac	0.41	0.48	0.60	0.73	0.95	1.14	22.7%
Market Analytics		2015	2016	2017	2018	2019	2020	CAGR
	Global	1.34	1.49	1.65	1.86	2.08	2.41	12.5%
	Asia Pac	0.30	0.34	0.38	0.44	0.50	0.59	14.6%
Risk Analytics		2015	2016	2017	2018	2019	2020	CAGR
	Global	14.73	16.45	18.56	20.97	23.99	27.02	12.9%
	Asia Pac	3.08	3.49	3.99	4.58	5.32	6.10	14.7%
Supply Chain Analytics		2015	2016	2017	2018	2019	2020	CAGR
	Global	2.76	3.15	3.60	4.11	4.85	5.58	15.1%
	Asia Pac	0.59	0.69	0.81	0.94	1.13	1.33	17.5%
		2015	2016	2017	2018	2019	2020	CAGR
	Global	0.075	0.088	0.105	0.123	0.150	0.178	18.9%
	Asia Pac	0.075	0.088	0.105	0.123	0.150	0.178	18.9%

Table 4: Market for Types of BDA Functions 2015 – 2020 (in USD billion)

2015 to 12.3% by 2020. Supply Chain Analytics are also expected to offer many opportunities to BDA

solution providers, with CAGRs of 18.9%, 17.5% and 15.1% of the ASEAN, Asia Pacific and global markets respectively.

6 ASEAN eCommerce: A Market Waiting To Shine

David Wong Nan Fay
ASOCIO Chairman-Elect

On November 11 (11/11) this year, Alibaba's famous Singles Day event raked in record sales of US\$17.8 billion. In less than five minutes upon the midnight start of the event, US\$1 billion of sales was made. The 24-hour online shopping festival has already surpassed last year's sales record of US\$14.3 billion with still nine hours left.

Alibaba's signature event since 2009 continues to be a symbol of retail ecommerce success to the admiration of its fans and the envy of its rivals. Their sales in the past have exceeded the combined sales of United States' Black Friday and Cyber Monday events. Recently, the Malaysian Government appointed Alibaba's founder Jack Ma as Malaysia's Digital Economy advisor.

China's retail ecommerce market is huge, valued at US\$250 billion in 2014, as compared with the US market, valued at \$240 billion according to AT Kearney's "Impact of AEC on Cross Border eCommerce" report, released this year. ASEAN, lags behind with a market value at \$US9 billion, less than 1% of the global retail ecommerce market of US\$1 trillion.

China's online retail sales in 2015 was about 14% of its total retail sales, followed by the US at 11%. Retail ecommerce in ASEAN showed a much lower percentage signalling signs that the region still has not reached its true potential. Among the six biggest ASEAN economies (ASEAN6), Singapore posted the highest online retail sales at 5%, followed by Indonesia and Thailand, each at 2%. Malaysia, the Philippines and Vietnam each posted online retail sales of less than 1% of total retail sales.

Awaking the sleeping ASEAN ecommerce giant

The ASEAN region, comprising 10 countries, will celebrate its 50th anniversary next year. The population of the ASEAN6 stands at 546 million. More than a third of the population are internet users and more than half of the internet population are digital buyers.

The number of mobile connections in this segment of ASEAN, is about 716 million, exceeding even its population. These encouraging data points are the factors expected to drive ecommerce growth in ASEAN. AT Kearney estimates ecommerce in ASEAN6 will grow at an annual 25% for the 2016-2020 period. This will make the region's ecommerce growth to be at par with that of China. (See Figure 1)

Indonesia on its own is expected to capture 52% of the ecommerce market in Southeast Asia by 2025, an increase of 31% from 2015, according to its government and supported by data from Google, Temasek and McKinsey. The increase is largely due to a rise in the middle-class population, increased access to internet, and growth of tier 2/3 cities, where access to organised retail is limited.



Factors driving ecommerce growth

The ASEAN6 population has all the ingredients to drive ecommerce success. They are young, connected, social media addicts and are smart phone savvy. According to Malaysia's Ministry of International Trade and Industry National eCommerce Strategic Roadmap Overview report, in 2015, about 70% of the population were aged 35 and below.

Quoting figures from Trend Macro, MasterCard, PayPal, Frost & Sullivan and AT Kearney, the report stated that users were online at least 14 hours a week and one third of the online activity was for social media. Because of the mobile-first consumer behaviour prevalent in the region, users are more likely to place an order online via their smart phones.

Expected annual growth rate per region (2015-2019)

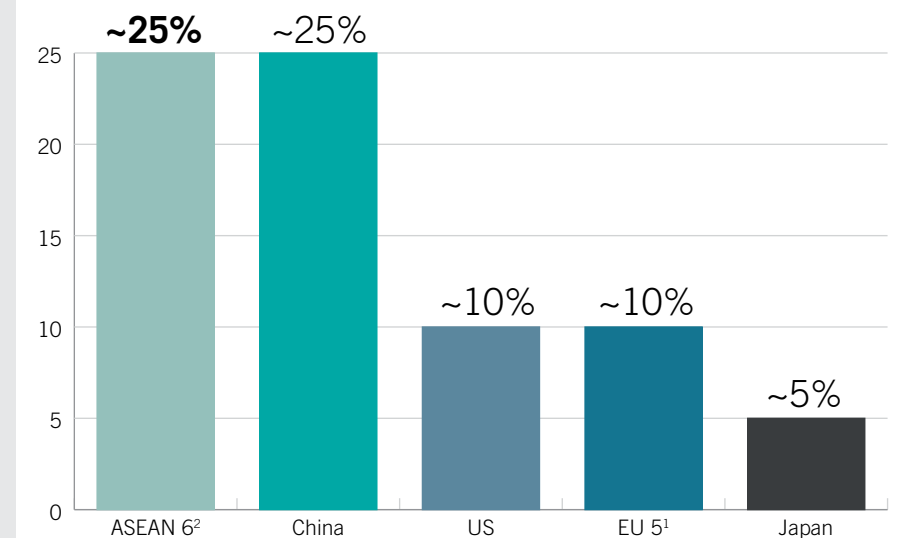


Figure 1: ASEAN has potential growth of ~ 25% per year going forward

Source: eMarketer 2013, A.T. Kearney

1) Includes Germany, France, U.K., Italy and Spain

2) Includes Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam

Tastes and needs of consumers are evolving but they do not always get what they want from the online marketplaces in their home countries. The number of consumers placing online orders overseas is growing.

The main drivers are attractive prices, availability of the product, a range of selection and accessibility of the products. So it would make business sense for retailers to go on board the more established foreign marketplaces to reach out to an international customer base. Hence, this is why cross border ecommerce is growing in importance.

But merchants need to be aware of a whole range of issues meeting them when they embark on their cross border journey. These include global logistics, duty, landed costs, tracking of products, consumer experience,

tax, brand risk, multilingual support, international payment, payment fraud, GST and Return of Goods.

AEC: Solution to barriers to cross border ecommerce?

The establishment of the ASEAN Economic Community (AEC) on December 31 2015, created a single market worth US\$2.6 trillion in a region where the population is over 622 million. The economy of the region in 2014, was the third largest in Asia and the seventh largest in the world. What AEC will do is facilitate a huge economic integration resulting in the region being a single market and production base. This will make it a highly competitive region, demonstrate equitable economic development, and become fully integrated into the global economy.

When AEC becomes a reality, what we will see in ASEAN is a free movement

of goods, services, and investments as well as freer flow of capital and skills. ASEAN, as a result, will be further strengthened and become an appealing investment destination once trade and investment laws are in place.

AEC is a vehicle that can boost ecommerce growth as it is expected to lower barriers, encourage investment and boost sentiment.

Formation of the ASOCIO digital task force

In Oct 2015, PIKOM mooted the idea of setting up an ASOCIO AEC Digital Task Force to collaborate with the governments on AEC matters and overcome cross border challenges to accelerate the growth of the ICT market in ASEAN.

The task force, which was chaired by PIKOM, comprised ICT leaders from

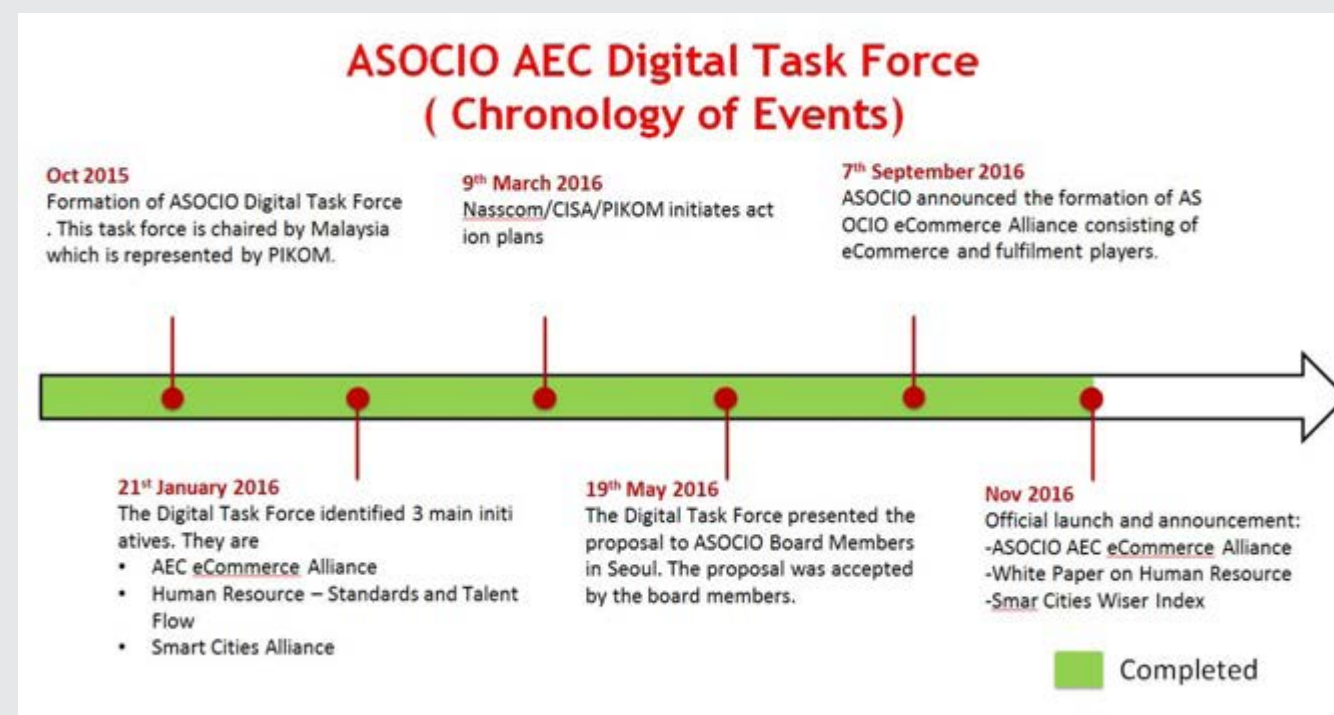


Figure 2



ASEAN member countries which are part of the 24-member economies of ASOCIO. The terms of reference of the task force are:

- i) Engage with AEC to encourage maximum participation in business opportunities among ASOCIO member economies;
- ii) Develop trade initiatives aligned to the blueprint of AEC;
- iii) Create a platform to leverage and support freer flow of skilled workforce, products and services;
- iv) Position ASOCIO as a vital interest group of AEC.

ASOCIO AEC ecommerce alliance

AEC ecommerce Alliance is one of three main initiatives of the digital task force. The other two are Human Resource – Standards and Talent Flow and Smart Cities Alliance.

Under this initiative, ASOCIO will engage with AEC to achieve a no-barrier ecommerce trade within ASEAN, drive programmes that will grow regional SMEs and groom the future ecommerce champions within AEC. It will work closely with governments and AEC secretariat on incentives/legal & tax framework/infrastructure necessary to facilitate ecommerce growth in the region.

Key ecommerce challenges for SMEs

In September this year, the digital task force held the inaugural ASOCIO AEC ecommerce Alliance meeting to identify the barriers faced by the ecommerce players in the region to conduct cross border ecommerce business. More than 25 participants from five countries attended the two-day event which was held in Malaysia.

The main talking points were issues like: setting up a legal entity to participate in the foreign marketplace; major problems in understanding different cultures in different countries; widely dispersed origin and destination of the shipments and complexity in fulfilling international orders. (See Figure 3 for a comprehensive list).

Proposed end-to-end solutions: From SMEs onboarding to ecommerce transactions to order fulfilment

It is encouraging to see the growing number of successful ecommerce platforms, payment gateway providers and efulfillment providers in the ASEAN region. (See figure 4).

Having a number of local and large players gives consumers plenty of

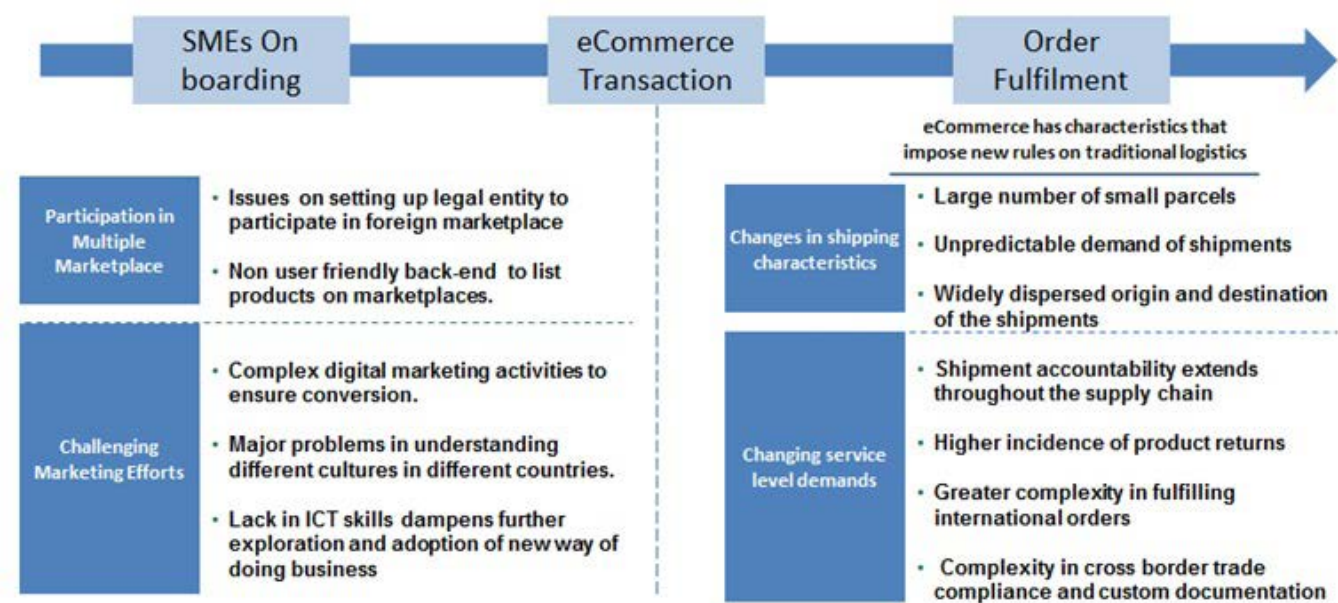


Figure 3



Figure 4

options to shop online, propelling the growth of ecommerce in the region.

The newly formed alliance recommends the following to address the key challenges of cross border ecommerce:

- Cross International Marketplace Collaboration
- Initiate a comprehensive SME onboarding programme
- Facilitate the set up of an efulfillment network that provides competitive and high service to merchants and consumers



Figure 5: Cross International Marketplace Collaboration

Outreach	Coaching & Handholding	Monitoring
<ul style="list-style-type: none">▪ Identifying Targeted SMEs▪ Establishing outreach partners▪ Conduct outreach events▪ Conduct marketing campaigns	<ul style="list-style-type: none">▪ Advise SME on the right marketplace▪ Conduct basic ecommerce classes<ul style="list-style-type: none">- Guidelines on exporting- Guidelines on product listings- Guidelines on photography- Guidelines on packaging & fulfilment▪ Conduct Advance ecommerce classes	<ul style="list-style-type: none">▪ Monitor sales performance▪ Provide incentives▪ Market success stories

Table 1:Comprehensive SMEs Onboarding Programme

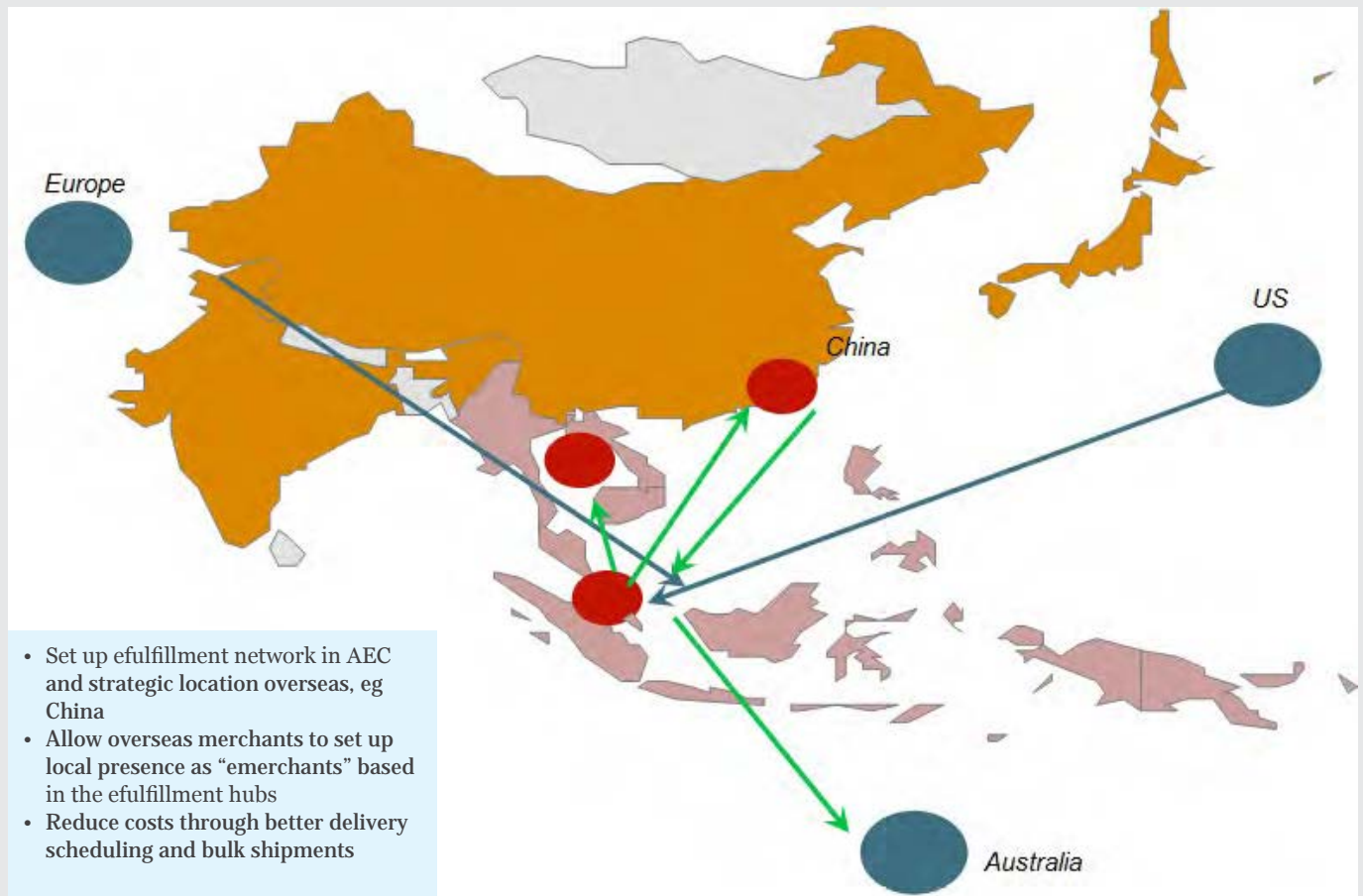


Figure 6: Setting up AEC eFulfillment Network

Government support is the backbone of ecommerce success

In Malaysia, the National Ecommerce Council initiated by the Ministry of International Trade and Industry outlined a strategic roadmap comprising six thrusts aimed at doubling ecommerce growth.

The thrusts are: accelerate seller adoption of ecommerce; increase adoption of eprocurement by business; lift non-tariff barriers; realign existing economic incentives; make strategic investments in select ecommerce players; and promote national brand to boost cross border ecommerce.

The AEC ecommerce Alliance, which was formally launched at the ASOCIO ICT Summit in Yangon, Myanmar on



Nov 15, will have a significant impact on three of the thrust areas – accelerate seller of ecommerce, lift non-tariff barriers; and promote national brand to boost cross border ecommerce.

With close collaboration with the respective governments and the ICT stakeholders in the region and tapping on new opportunities, we believe ASEAN can be an ecommerce giant in the very near future.

7 | First Look: The “Disruptive” Kids

Teenagers in Asia are getting the startup bug and are courageously planning their businesses during university days, believing it would be a viable career choice from day one.

"Many of them start the business straight out of university and so they have been working out their plans during their student life," said Nick Feneck, Associate for Asia at Seedstars, a global startup competition.

He added that in Myanmar, there was a youngster at 15 years old who entered the Seedstars competition. In Malaysia, it is common for 19-year-olds to begin plans to roll out their startup business.

In Malaysia, Seedstars have received about 200 applications for their competition in the past two to three years. It is always exciting to start a new business but sustaining it is the challenging part as 90% of all start ups fail, according to Seedstars.

"It is easy for startups to live and perish in a very short time, sometimes as short as 12 months," said Feneck. One of the successful trait of a startup is to have a huge social impact like fintech startup My Cash Online, he added.

My Cash Online's e-wallet service, allows migrant workers - a majority of whom do not have bank accounts - to reload phone credit, pay bills and buy bus tickets.

My Cash online was the winner of the Seedstars Kuala Lumpur competition recently held in October 2016. This company is one of those interesting startups featured in this chapter which have shared their growth story, challenges and achievements and future plans.

Errand-running to a Successful Start



Goget.my burst into the technology scene with their errand-running app service two years ago. It identifies itself as a market place for errands, deliveries and much more. Posters are those who want the job done and GoGetters are those who get the job done. GoGetters pack boxes, send personal items to your girlfriends and mothers, do groceries, make hospital visits, deliver food, care for pets and many more. It is like being a personal assistant, but for many people.

The company's aim is to build a community of gogetters who are resourceful and enterprising.

Their slogan "Anytime, Anywhere, Anything" seems like a tall order, but the young company is determined to succeed to make a difference in the community.

Francesca Chia, one of the three founders of Goget.my and also chief community manager said the company's technology will drive Malaysians to be more enterprising, allowing them to be true-getters.

"No longer will lack of time or distance be issues in getting things done and no longer will Malaysians have to accept minimum wage," she said.





Like any new business, Chia and the other founders, Tai Fung Wei Tan and Muaz Jema also faced challenges, but they leveraged on their team spirit to overcome them.

“We are a big believer in listening to the market and getting our users to tell us what to do. So really, we get through challenges together with our users,” she said

One of the greatest highlights of Goget was hitting the RM1million mark in Goget earnings at the start of this year.

“What this means is that we built a network for flexible help where over RM1million was created and money was in people’s pockets for their hard work and contribution as a GoGetter.

“Back in 2014, when we rolled out, people were highly doubtful about the model of outsourcing your task to another person,” she said.

Chia said the company is confident they have completely removed that doubt and say that this is not only entirely possible, but there is also a market for it.



In fact the company began with just 12 go-getters and now they have 4,000.

“We don’t believe that we have even made a dent in the true size of the opportunity. We know we have a lot more to learn, build and improve on. But we will keep going to innovate in the space for flexible labour and empower people to earn through a new way of employment,” she said.

Goget.my has partnered with many retailers from the mom and pop shops/stalls such as Nasi Kukus by Farni in Bukit Damansara to big

chains such as The BIG Group. They have also worked with telcos such as Maxis, major banks in Malaysia and also Google. Motivated by the success of their model, Goget has spread its wings and is now in Hong Kong. “Our vision is to empower millions of people to experience this new way of earning in their cities,” she said.

Goget.my is also working on new products and one of them is GoGet Business, which is intended to ease the burden of businesses which have a tough time finding reliable part time help. ♦

Grabbing Headlines with a Ride-hailing App

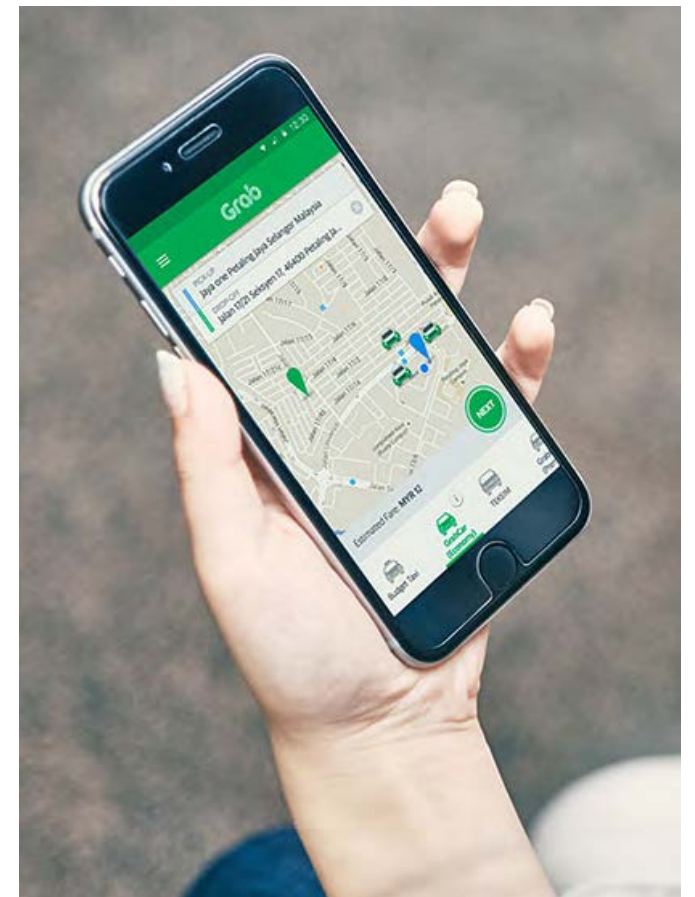


In today’s world of smart technology, a couple of innovative companies have created ride-hailing apps that allow anyone to provide door-to-door transportation service and be financially rewarded. This is a welcome move for Malaysians eager to earn extra cash in view of the current gloomy economic uncertainties.

The ride-hailing apps more common in this region is the four-year-old Grab, which operates predominantly in Southeast Asia. They are in 32 cities in five countries which are Malaysia, Singapore, Thailand, Vietnam, Indonesia and the Philippines. There are now over 500,000 drives in their network. Company records show that there have been over 24 million mobile downloads by passengers and would-be passengers.

Grab has been grabbing headlines with their continuous roll out of new services which include GrabTaxi, Grab Car, Grab Bike, GrabHitch and GrabExpress. Currently however, not all countries offer the same services.

The GrabCar and GrabHitch services appeal to those intending to earn extra money by offering transportation services with their private vehicles.





Grab's service appears to be responding to the lack of a dependable public transportation service especially during peak hours, at night and during bad weather conditions. It has also been extended to other states in Malaysia where taxi services are not widely available.

Like any transportation business, the key to sustainability is the commitment by the company and the drivers to provide a safe and reliable service for the passengers. The operators should also ensure a fair payment structure is in place and their mobile apps are in great form 24x7. The internet

connection should be at optimum level at the touch of the button.

Grab has reiterated that safety is paramount to them. The company stated they invested substantially in safety training for drivers, offline driver screenings, in-app safety features like number masking and personal accident insurance coverage. Grab also provides safety education talks and has struck partnerships with the Government.

"Our belief is that an app-based transportation platform with the right investment can become the safest form

of transportation in Southeast Asia," stated the company. The company stated that Southeast Asia is an ideal ridesharing market where car ownership ranks among the lowest in the world.

"There are 70 cars per 1,000 people in Southeast Asia compared with 103 in China and 574 in the United States."

Grab is also confident of the strong emergence of online to offline services due to increasing smartphone penetration, which is expected to double in the next five years in Indonesia and the Philippines and exceed 100% in Malaysia and Singapore. ♦

How Online Bus Ticket Booking is Catching On

A bus journey is one of the most affordable means of travel. The trip is not only cost-friendly, but also a pleasant experience as you can enjoy the sights and sounds of the towns on the way to your destination.

But booking a bus ticket can be a tedious process if you are planning to do so at the bus stations. Distance and time can cause a delay, and even spoil your travelling plans if the tickets are all sold out. Imagine not being able to return home to your family during the festive period.

We have seen how technology has allowed us to plan our holidays at the click of the mouse or at the touch of our smartphone buttons. Online travel booking is all the rage these days especially during the holiday seasons.

But booking a bus ticket online appears to take longer to take off in this part of the world.

Catch That Bus Sdn Bhd who launched their online bus ticket booking platform in December 2013 had a challenging start. Co-founder Ashwin Jeyapalasingam shared how in the first year, the company placed much efforts in educating and showing bus operators that online was the way forward.

"Conversion was a slow process and usually required months of follow up before we got a breakthrough with the bus operators," said Ashwin, who is the Chief Operating Officer of Catch That Bus.

He added that the second and third years of the operations were dedicated to teaching the consumers about

getting comfortable with online booking. "In an industry where cash is king, this education process has been arduous, but satisfying. Almost 30% of the customers who bought from us have never purchased anything online," he said.

But the startup's efforts have paid off as now more than one million tickets have been purchased through their booking platform since the company started. There is also a Catch That Bus mobile app.

"We aim to transform the experience of bus travelling from the initial ticket purchase, to boarding the bus and subsequently the traveling to make it convenient, simple and transparent.

"As a result, taking a bus becomes the preferred travel option," said Ashwin,



Ashwin and Viren.



who co-founded the company with Viren Doshi, his friend from their Taylor's College days.

Both Ashwin and Viren left their high flying jobs in 2012 to start Catch That Bus. Ashwin, who holds a MSc Management degree from the London School of Economics, worked as an Associate Director in PricewaterhouseCoopers Malaysia's consulting division, for seven years before quitting.

Viren, who holds an MBA from the Australian Graduate School of Management, worked as a Technical Consultant in Siemens and later became a director of Soutra Trading which imports and distributes photocopiers.

"We kept in touch during our working life and talked quite a bit about launching a business together," said Ashwin.

The company focuses on express bus travel, or travel between cities, by integrating with over 50 bus operators who currently travel to 1,200 locations in Malaysia and Singapore.

Catch That Bus began with three staff and now has 40 staff in both Singapore and Malaysia. "We would like to expand to other Southeast Asian countries such as Thailand, Indonesia and Vietnam in the near future," he said.

The hard work and long hours paid off when Catch That Bus was awarded the Cradle CIP150 Catalyst grant. They also won the Microsoft Technology Award of RM100,000 at the Alliance Bank SME Challenge and clinched the APICTA tourism award.

But what was personally rewarding to them was being recognised instantly for what they do. "We took a Grab ride the other day and the driver wanted to

know what we do. When we said that we developed an app for buying bus tickets, he replied, "Oh, like Catch That Bus, ah?," said Ashwin in recalling the incident. He added it is this interaction with the public and the many positive comments from customers that keeps them motivated to do more for the bus transportation industry.

"We have also begun to work closely with SPAD (Land Public Transport Commission) to help drive positive developments within the bus industry," he said.

On their catchy company name, Ashwin said it was chosen because it reinforced their mission to help improve the bus transportation system.

"Catch That Bus clearly explained what we wanted to achieve, mainly that everyone is able to catch that bus!" he said. ♦

Meeting the Needs of the Cost-conscious Consumers

Finding the best price of a particular product used to be a favour that Sze Kok Hoong did for his friends, relatives and ex-colleagues during his career spanning more than 20 years. He specialised in sales, distribution and product marketing in industries such as telecommunications, banking and insurance.

Sze said when he worked for LG Electronics, he used to receive many requests for the best prices of electronics goods. "I would then research for the best channel or retail outlet. This happened quite often during my career and I grew to love doing this for people," he said.

Building on his passion, he developed a price comparison site featuring the whole range of products that he had expertise in. He named the site BolehCompare, to show the world that the company is from Malaysia.

The site, which went live in March this year, compares products such as postpaid phone subscription plans, internet broadband plans, smart devices, insurance plans, credit cards, personal loans and home financing loans. "We help customers save time and money by helping them to find best products and prices in town through our platform," said Sze.

He added that a solid, extensive and updated database is the core backbone of a price comparison platform. "It should be managed by a team of local experienced professionals who have a great understanding of the products in each respective domain," he said.

BolehCompare was one of the 10 finalists in Seedstars' pitching competition, the Kuala Lumpur chapter. Though the staff strength is currently only five, the company is big on its future goals. Sze, who heads the company, said he wants to make BolehCompare the largest price comparison site in Asia.

There are quite a number of similar and more established price comparison sites even in Malaysia but he hopes to make BolehCompare number one in the country in 18 months and in the top three in Southeast Asia. Sze said he was inspired by the success of moneysupermarket.com, a UK-based public listed company, one of the top price comparison companies in the world.

"We hope to be the Moneysupermarket of Asia soon," he said. ♦



Boleh Compare Founder Sze Kok Hoong delivering his presentation at the Seedstars Kuala Lumpur pitching competition recently.

Drop-shipping: Creating Opportunities for Online SME Merchants



Dropee team having a brainstorming session.

Drop-shipping is defined as the movement of products from the manufacturer or the wholesaler directly to the customers without going through the retailers who process the order. Drop-shipping is a type of ecommerce business model that has been gaining popularity in the world.

Three months ago, Dropee, a Malaysian drop-shipping marketplace entered the scene. Founded by Lennise Ng and Aizat Rahim, Dropee helps SME online merchants to easily source high quality and unique products directly from wholesalers and manufacturers. It works with independent brands to

secure inventories for immediate drop-shipping.

"We are passionate to help online entrepreneurs who wish to make a mark in the ecommerce industry," said Ng, who is also Dropee's chief executive officer. "We are now working with over 70+ international brands to be rolled out onto our platform such as Ferrero Rocher, Cadbury, and Anakku," she added.

Dropee, the first runner-up at the recent Seedstar pitching competition for Kuala Lumpur chapter, is a strong advocate of the free market economy. "We cover

all parts of the supply chain from manufacturing to retail and we have seen how big such pricing arbitrage can be, especially with imported products. Now with technology, we hope to use it as a layer to instantaneously connect from farm to table reducing multiple layers of "fat" also known as the middle person and benefit the end users globally," she added.

Drop-shipping was listed on The Huffington Post as one of the 101 ways to earn money from home. This is a trend many have embraced to earn extra cash. ♦

House of Safe Beauty Products

Azrina Naimuddin is serious about using cosmetics and personal products that are both halal and free from harmful ingredients. But finding such products is easier said than done.

The self-confessed shopaholic said she did not know where to find halal cosmetics and a skin care range whenever she travelled with friends overseas. She then made it her mission to solve the problem faced by millions of Muslim consumers worldwide to acquire 100% halal products.

Hence VivaQueenBee.com was born in April this year. It claims to be the first online shop of its kind that houses halal personal care products worldwide under one virtual roof. "We personally select products that are Islamic-compliant. All products sold are certified Halal and free from harmful chemicals like Paraben and SLES so it takes the guess work out of the equation," she said.

Azrina, a degree holder in Biomedical Technology from Universiti Malaya, said her role is also helping consumers make informed decisions by educating them about the scientific lingo. There are currently over 200 products sold at VivaQueenBee.com, including hair care products, body care products, facial care as well as men's toiletries and skincare. They also carry nail polish in 20 brands worldwide. For most of her corporate life, she worked in a brand management role for fast-moving consumer goods (FMCG) companies based in Malaysia, Singapore and London.

Azrina aims to make VivaQueenBee the global Muslim's No. 1 shopping destination for cosmetics and personal care products. It was reported recently that the global market for halal cosmetics and personal care is worth RM695 billion according to the Halal Industry Development Corp. Thomson Reuters reported that the spending is expected to reach US\$73 billion by 2019. ♦



VivaQueenBee - Azrina (second from left).

Serving the Unbanked Community



There are more than three million migrants in Malaysia and most of them have no access to any bank or credit cards. The unbanked community are unable to make ATM withdrawals, perform online ticketing as well as perform online shopping and online banking transactions.

To address this problem, Bkash Fintech Malaysia Sdn Bhd developed MyCash Online in April 2016. It was built to be a reliable, secure and convenient platform for the unbanked migrants to purchase products and services online.

MyCash Online has recorded 96,971 transactions worth around RM800,000 from about 26,000 unique users in the first four months since it started. Over 300 agents in Malaysia are part of their network.



They are also providing online mobile top-up in Malaysia, Nepal, Bangladesh and Indonesia as well as bus ticket and bill payment services.

MyCash Online impressed the judges with their business model at the Seedstars global startup competition, Kuala Lumpur chapter, when they emerged as the winners, beating 10 other startups. Next April, the company will represent Malaysia in Seedstars

World Summit in Switzerland to compete for up to USD500 million in equity investment.

The team is headed by Looi Yin Lin, the managing director, and Mehedi Hasan Sumon who serves as a chief technology officer and who is also a Bangladeshi national. Akm Nurol Haq, the chief financial officer, was responsible for signing up over 280 agents in just four months. ♦

Marrying Online and Offline Business



(From left) Muhammad Amiruddin Bin Ariffin, Carolyn Hai, Lee Wei Chee, Tracy Ng and Alice Foong.

A frequently-asked-question of a retailer is how to get digital followers to visit their physical stores. A digital marketing campaign is only as good as it gets if it can drive and convert the online crowd to become offline customers. This was the objective of Cheqqme Sdn Bhd when they developed their mobile marketing app of the same name. Cheqqme approached the challenge by allowing retailers to run their marketing campaigns on their platform to increase brand awareness, promote their products or services and maximise repeat purchases.

CheQQme also gamified its marketing campaign and made it fun for the users to discover great deals, rewards, fun challenges and experience a unique mobile buying experience. Currently, it is running a campaign to introduce its currency, "Crowns" for users to purchase products from CheQQpoint which is the e-Store within CheQQme.

Cheqqme, founded by Lee Wei Chee and Adrian Honegger, was named to mean check-me-out and the double

'q' is to signify the QR code scanning between a user and a merchant.

The name also serves as shout-out from their customers who are the retail merchants and brand owners, to their prospective customers - the users of their app - to 'check them out,' for ongoing interesting campaigns and deals. It currently operates just in Malaysia but the young company has an ambitious plan to expand regionally in ASEAN within the next three years.

The company, in sharing their seven-month-old journey, said they faced the challenge of engaging more users to attract more merchants on board and at the same time finding great brands or merchants to the platform to entice new users. As a startup without strong branding, it has been hard to convince potential merchants.

There is an ongoing education about the brand and the product to build their confidence in using the platform. Finding good developers has also been a recruitment challenge for Cheqqme.

Despite these challenges, Cheqqme's staff strength grew from three to 12 and it has 196 merchants and 1,005 users from when they first started in April this year. On another positive note, CheQQme Sdn Bhd successfully enrolled in Cradle Investment Programme, and became one of the recipients of CIP 500 in September this year. CIP 500 is a seed fund which primarily funds commercialisation and offers up to RM500,000 per deal.

The target recipients are budding companies. The fund offers advanced level of commercialisation support to recipients such as monitoring, mentoring, market access, product refinement and capacity training. Being a recipient of the CIP500 was one of the significant steps for CheQQme as it proved to the company that there are people who believe in what they do.

CheQQme's partners include Malaysia Retail Chain Association (MRCA), Selangor Information Technology & E-Commerce Council, Vilor Berhad and Tune Talk. ♦



8 Smart City: The New Frontier of Innovation

Toh Swee Hoe

Advisor,

Malaysian Communications and Multimedia Commission Academy

A transformation of how cities function is underway through innovations emerging from IoT, cloud computing, big data analytics, mobility and empowered citizens.

Of late, there has been a lot of news about the deployment of the smart city concept in many cities around the world that make them ‘clever or smart’. The smart city approach is gaining momentum around the world, as local authorities look to manage their cities in a more efficient manner. This is often done through use of innovative technologies like sensors, smart meters, transport technology and better internet infrastructure and services. The increasing power and decreasing cost of ICT with big data analytics are at the heart of all this.

Smart cities come in many variants, sizes and types, depending on the policy, characteristics, approach, funding and scope. According to IHS (a global source of information and insight), there are currently 21 smart cities and the number will go up to 88 by 2025. Of these, 32 will be in Asia Pacific, 31 in Europe and 25 in the Americas. A city is considered a smart city if at least three sectors or characteristics of a smart city are implemented. Prime examples of smart cities around the world are Nice, Amsterdam, Barcelona, Kyoto, Beijing, Singapore, Seoul and San Francisco.



- Commitment by Local Authorities to implement a Local Digital Agenda in their Territories:**
- To work actively towards the development of our cities and regions, using Information and Communication Technologies as an instrument for sustainable development in all its dimensions, for each and every community, to bridge the North-South divide, and for all citizens, against marginalisation and social division;
 - To implement in our cities and regions an e-local agenda (Digital Local Agenda), designed to promote the Information Society, taking into account in particular the socio-economic and cultural environment, and based on the broad participation of citizens and social actors, with the ultimate objective of fostering sustainable development;
 - To strengthen the enabling role of local and regional authorities in guaranteeing adequate and secure technological infrastructure and in promoting ICT-based applications for inclusive services;
 - To promote, in so far as it is possible, the use of free software and other tools that facilitate inclusion and digital solidarity;
 - To facilitate the mobilisation of resources for digital inclusion, by engaging, if necessary, in new financing mechanisms;
 - To prompt all local and regional organisations involved in the development of a more equitable information society to implement the commitments of this Declaration.

Source: 2nd World Summit of Cities and Local Authorities on the Information Society, Bilbao 2005

Why smart cities?

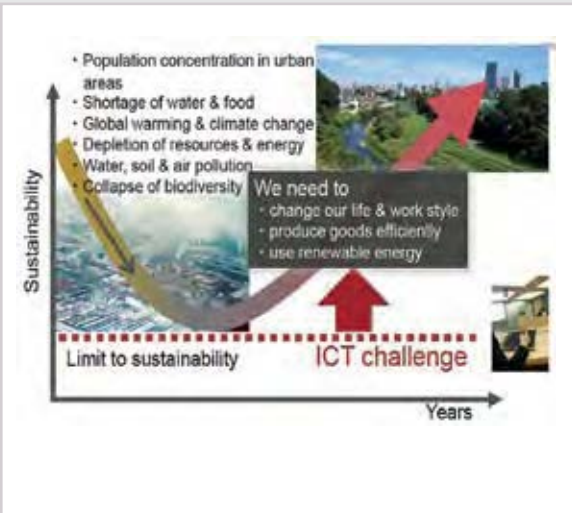
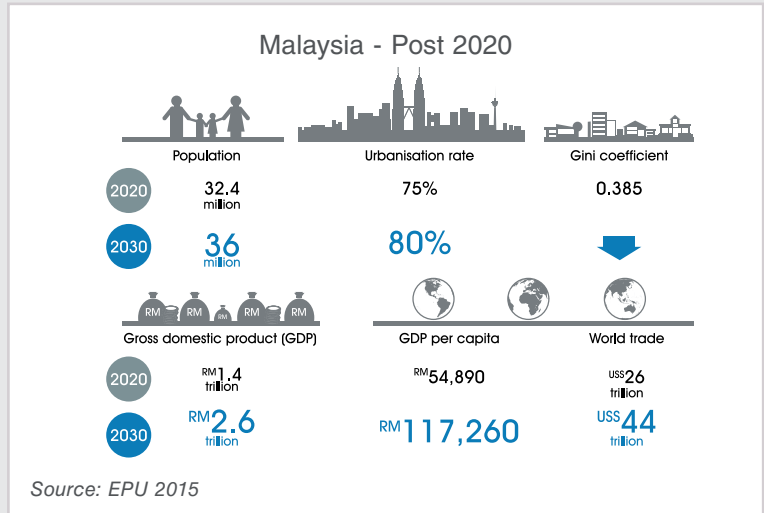
Smart cities have attracted much attention globally as they can potentially provide values and solutions to the many challenges and opportunities that urbanisation brings to society. Cities are primary drivers of economic growth and innovation for national and even regional economies. Cities are attractive to highly skilled and educated workers and gateways for new immigrants. They are important trade hubs for both goods and services, and the focal points of global commerce. Cities house substantial infrastructure assets and major institutions that power regional

prosperity and the nation's quality of life. These critical characteristics make cities strategic leverage points and making them 'smart' will contribute to strengthen and sustain a nation's economy and competitiveness.

The attraction of cities has caused rapid urbanisation, creating cities and mega cities (usually defined as cities with population of over 10 million) and putting pressure on city services such as transport network, health services, emergency services and utilities. It is possible then to envision how the use of ICT or 'smartness' in city operations

- Future Cities - Challenges and Opportunities**
- Climate change
 - Population growth
 - Globalisation of economy, demographics, risks and ecologies dependencies
 - Technological developments
 - Geo-political changes
 - Human mobility
 - Ageing populations
 - Inequality and social tensions
 - Insecurity (e.g. energy, food and water)
 - Changing institutional and governance frameworks

Source: Foresight Future Cities Project, Future Cities Catapult, UK, June 2014



can help drive innovation to address or mitigate the negative impact to society from rapid rural to urban migration and its influence to the wider global environmental ecosystem.

What is a smart city?

What makes a city 'smart'? There are many definitions of smart city, some focusing on ICT as a technology driver and enabler, whilst other broader definitions include socio-economic, governance and multi-stakeholder aspects such as the use of social participation to enhance sustainability, quality of life and urban welfare.

A definition taken from the International Telecommunications Union ITU-T SG5 Focus group on Smart Sustainable Cities provides a good overall description: "A Smart Sustainable City (SSC) is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social and environmental aspects" ITU-T SG5 Focus Group on Smart Sustainable Cities.

What is it like living in a smart city?

The very concept of a smart city promises us that our quality of life will be better. In a smart city, ICT will be hard at work everywhere to support our 24-hour life, whether we are at home, at work or leisure. Security, weather, environmental and traffic sensors would be performing various functions in the city linked by an extensive telecommunication network. The network, wired and wireless, will be communicating information for processing and presentation to a control room (possibly also made available to the citizens) that takes care of or support the needs in the city.



Things in a city - the electricity grid, the sewer pipes, roads, street lightings, traffic systems, buildings, cars and more - will be connected to the network in a smart city of the future. Buildings will turn off the lights for you. Street lighting is turned on or off depending on the presence of people or dimmed according to the brightness of the moon or its surrounding. Self-driving cars will find you the parking space that you wanted and rubbish bins will be smart, 'calling out' for collection when it is nearly full and many more.

Data Source	Smart City Market Size/Number of Projects
ABI Research	Smart city technology market in 2013 is USD8.1 billion and will grow to reach USD39.5 billion by 2018.
Frost & Sullivan	Market Global opportunity in Smart City market to total USD3.3 trillion by 2025.
GSMA's Connected Living Tracker	In 2012, there were 257 trial or commercial mobile smart city projects in Americas (38), Europe (166), Asia (38) and Africa/Oceania (11).
International Data Corporation	Estimate mainland China's city market to be worth USD10.8 billion in 2013 and forecasts double-digit growth for the next five years.
Lee & Hancock's analysis of data from IBM, CISCO, ABI Research, Gartner (2012)	In 2012, there were 143 smart city projects on-going or completed in North America (35), South America (11), Europe (47), Asia (40) and Middle East & Africa (10).
Pike Research	Smart city technology market in 2012 is USD6.1 billion and will grow to USD20.2 billion in 2020.

Source: MIIT, DG CNET, EU Commission - Comparative study of smart cities in EU and China, 2014

The consumer would probably be able to see water or electricity consumption through smart meters and be able to compare those to other citizens via a community portal, encouraging us to use utilities efficiently.

We may not even have to travel to a physical office anymore as we will be in a connected team and office and could work practically anywhere. We will be living a connected digital lifestyle of the future. For a peek into that future, some YouTube videos about smart city living can be explored, including the one made by MCMC in 2013 during the launch of Digital Lifestyle Malaysia.

Trends driving smart city

People like to migrate to cities as it has always been places of opportunity and even more so now in a knowledge and innovation economy. Recent estimates (Roundtable report – Mobile World Congress 2015 – Smart Cities and Ultra-Connected Nations) say that 80% of global GDP is generated in cities. People are attracted to cities to find jobs, friends, culture and enjoy the excitement of urban life.

Cities are also the sites of tremendous innovation as they can be great proving grounds for technologies, providing opportunities for people to invent, test and to sell new things. Smart cities therefore present a growth opportunity for suppliers of smart technologies. Such smart technologies can help address some of the challenges of urbanisation by helping to optimise resource consumption and improve services through better management of demand and supply.

Participative Governance Model
• Open and inclusive networks
• Open data infrastructure
• Visualisation
• Simulation and gaming
• Citizen engagement
• Integrated management structures

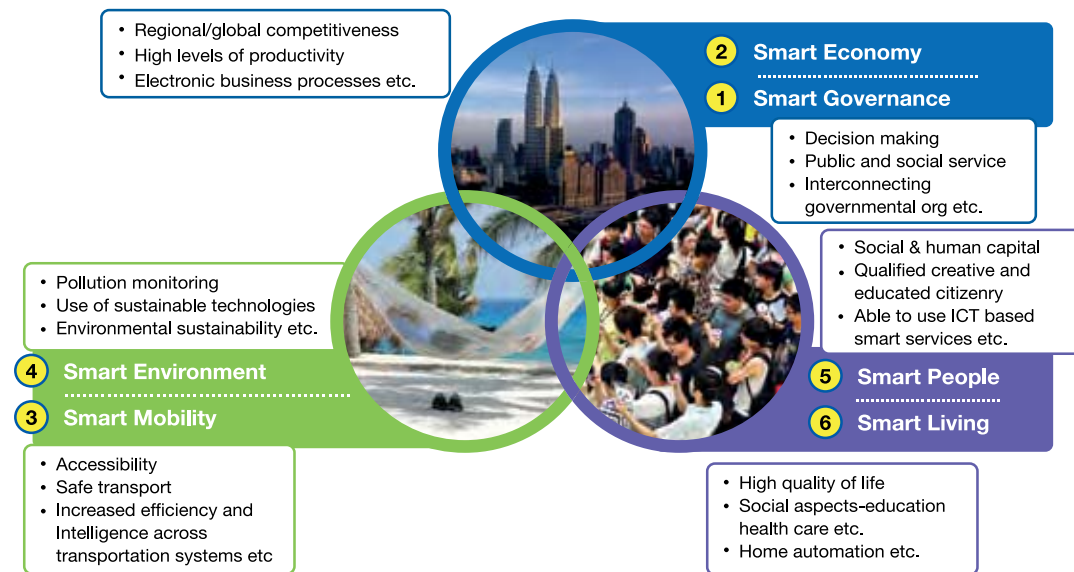
Technologies Driving Smart Cities
• Broadband connectivity
• Internet of Things / Internet of Everything
• Smart personal devices
• Cloud computing
• Big data analytics

Emerging innovative Business Models To Fund Development
• Cloud-based, pay-as-you-go models
• Creating revenue from data
• Pilot projects
• Smarter procurement

Source: MIIT, DG CNET, EU Commission - Comparative study of smart cities in EU and China, 2014

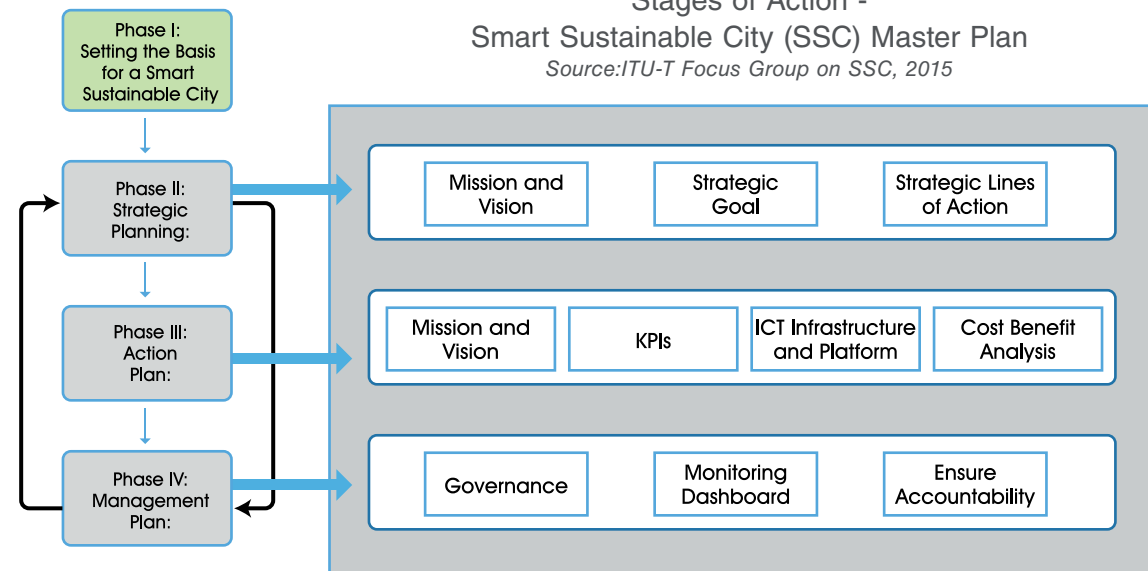
Six characteristics/dimensions in Smart Sustainable Cities (SSC)

Source: ITU-T SG5: Focus Group on Smart Sustainable Cities (SSC), Smart City Iskandar



Stages of Action - Smart Sustainable City (SSC) Master Plan

Source:ITU-T Focus Group on SSC, 2015



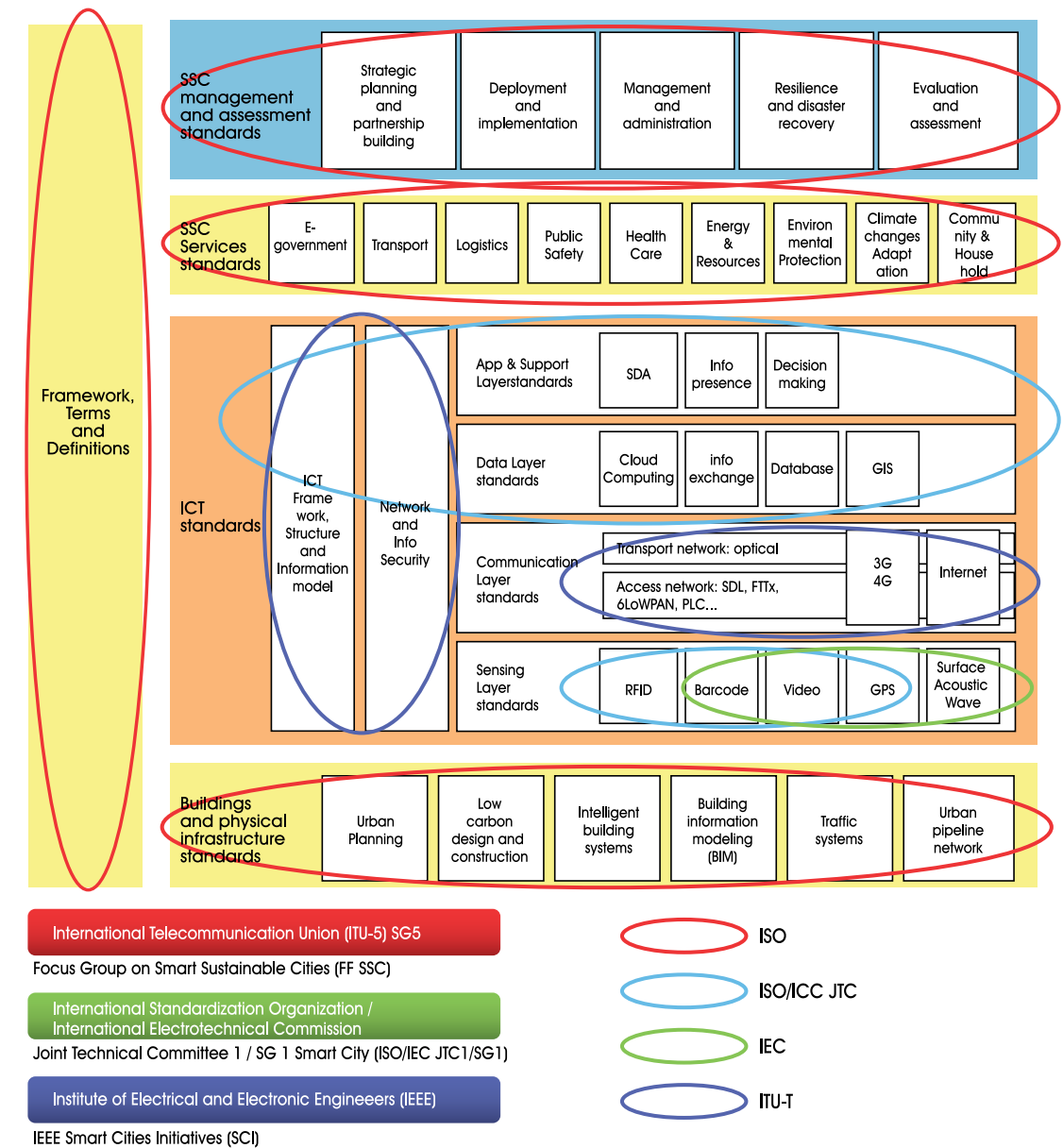
According to UN HABITAT, due to rapid urbanising trend, in 2007 for the first time in history, more than 50% (or 3.3 billion) of the world's population lived in cities. In 2014, there are 28 mega cities, which are home to 453 million people. It is expected that by 2050, city dwellers will make up 70% of the earth's population, or 6.4 billion. In Malaysia our urbanisation rate according to Department of Statistics Census 2010 is at 71:29 in 2010. We were at 50:50 in 1990 and 62:38 in 2000. We are expected to reach 75:25 in 2020 (World Bank - Malaysia Economic Monitor, Smart Cities 2011). Nearly 80%

of Malaysians will live in cities in 2030 (Economic Planning Unit report, 2015) and the ratio is expected to touch 90% by 2050 (The 2009 UN revision database).

Academic research has sparingly discussed this phenomenon. More work in this area is needed to better understand it. For instance, issues like population growth, urbanisation, environment and climate change, available limited resources and its overuse, impact and challenges on the limit of sustainability and quality of life and the innovative use of ICT

Smart City Model: Roles of different standards bodies in developing the sets of standards

Source:ISO/IEC JTC1 smart cities preliminary report 2014



in addressing them need research. Due to climate change and other environmental pressures, cities are increasingly required to become 'smart' to enable them to take on key measures to meet targets imposed by commitments and legal obligations such as reduction of greenhouse gases, employment rate, inclusion and sustainable development.

The market for smart city

Market size estimates for smart city vary widely from a number of data sources estimates but one thing is certain

- it is large and growing. The market depending on the sources may include smart solutions, products and services in verticals - water, waste, energy, transport and assisted living. It may cover market segments such as smart homes, smart transportation, smart utilities, smart integration, smart healthcare, smart education, and smart energy management among others. Solutions could range from the end-user, application, product, solution, utilities and technology. For example, ABI research quotes a market size of USD39.5 billion by 2018, and Frost & Sullivan,

USD3.3 trillion by 2025. Whatever the estimates, there is a substantial market opportunity indeed for Malaysian ICT industry. Today, over 300 smart city pilots are being conducted all over the world. It is used as a platform for business, technology and applications research and development and is seen as opportunities with future export potential.

The opportunities for businesses lie in addressing the current challenges facing cities and in developing innovations. Low hanging fruits are in traffic management, energy, safety, health and learning. The most pressing challenges are energy use and transport eco-system.

Smart city projects are usually complex, long term and unique with many stakeholders (government, financiers, urban developers, technology and service providers, and inhabitants)

and a variety of priorities and business models. It requires substantial financial investment and financing remains one of the greatest challenges to get smart city initiatives going.

The tables on the right show several examples of good practice, technology, financing and business models, the tools and techniques in the development of smart city. Across the globe, cities are exploring new emerging and innovative business models to fund projects. Also highlighted in the table is the trend of using an open and transparent or participative governance approach as opposed to the traditional closed and top down approach in building an innovative and inclusive smart city.

A common standards based smart city framework

There is a need for a common standards based smart city framework that stimulate mass market and

growth by ensuring and deploying innovative, replicable and scalable solutions. It will enable widespread participation in service development and community engagement and increase competitiveness of businesses by avoiding vendor lock-in. These factors form the basis of a smart city framework that could be used as a guide or common reference to studies or research and smart city planning and development.

The process of implementing smart city is an evolution of the institutional system and technical standards involving large-scale involvement of capital, technology, talents, authorities, cities and the community and industry. Common standards based smart city framework are being developed by a number of international standards groups. Key ones are International Telecommunication Union ITU-T-SG5 Focus Group on Smart Sustainable City, International



Emerging Methods In Harnessing The Power Of Citizens

- The collaborative economy:** Connecting distributed groups of people, using the internet and digital technologies, to make better use of goods, skills and space. This is important in cities where resources, particularly space, are limited.
- Crowdsourcing data:** People can use low-cost sensors to measure and create crowdsourced maps of their environments; city governments can crowdsource data from social media sites and sensors in mobile phones, as a supplement to citywide Internet of Things networks.
- Collective intelligence:** Decision making and problem solving are usually left to experts, yet citizens know a huge amount about their cities. New digital tools make it easier for people to get involved in policymaking, planning and budgeting, and this could help cities make smarter and more democratic decisions.
- Crowdfunding:** People can connect with each other online to collaboratively fund community projects and city governments can use crowdfunding to make spending decisions that more accurately reflect the needs and wishes of citizens.

Source: *Rethinking smart cities from the ground up*, Nesta, June 2015

Standardisation Organisation (ISO)/International Electrotechnical Commission (IEC) Joint Technical Committee 1/SG1 Smart City and Institute of Electrical and Electronics Engineers (IEEE) Smart Cities Initiatives. Together, they are developing a comprehensive set of guideline and standards addressing the needs of smart city development.

At the core is a set of standards for ICT infrastructure involving a large number of technologies: the Internet of Things (IoT), cloud computing, broadband communication infrastructure, 3G/4G mobile, Radio Frequency Identification (RFID), networking, geographic information system (GIS), satellite positioning, high performance computing, artificial intelligence, software engineering, system engineering, information security technology, modelling and simulation, analytics and so on.

The framework covers the sensing layer (IoT) that collects real-world object information through sensing equipment such as camera, environmental sensors, RFID and GIS installed in the city. The information collected is transmitted to a processing centre with the aid of the internet, wireless networks or optical fibre technologies that form the communications and data layer.

After applying analytics to the huge amount of information, intelligent control and management are applied at the applications layer resulting in improvement and efficiency of urban operations. It can be noted that the sensing layer integrates the connected relationship of people-things and things-things. It makes them 'communicate' with each other, thus allowing the whole city to display and utilise intelligent

characteristics and in real time not only at the control centre but which could also be extended to people via their smart phones. The use of standards approach for the development of smart cities is critical to ensure smart cities are built not as islands of information but as one integrated ecosystem. This will ensure that it will not become a headache to handle or lead to waste of funds or redundant implementation. Smart city involves large capital outlay and a future upgrade may become a big burden to bear if many technology schemes or systems are in play and are not well defined according to a common standard.

Smart city innovation centre

Another element in smart city development is a Smart City Innovation Centre. It is found in most of the highly ranked smart cities such as in Nice, France, London, Beijing and Amsterdam. The centre plays the role of showcasing projects, pilots from the latest research and applications by industry leaders to show how to cope with complex urban issues for the sustainable development of smart city.

The innovation centre provides a resource platform for projects and products in the smart industry and a hub for engagement, partnership or collaboration between participating enterprises and R&D institutes, governments and the people of the city. It connects, accelerates and challenges parties to propose and execute innovative solutions, ideas and new business models in addressing urban issues. Through such exchanges, learning and collaboration as well as professional advisory and roadmap building for smart city pilot programmes, the development of new innovative solutions, services and markets can be advanced or accelerated and be promoted



or replicated elsewhere via a network of cities, specialists and enterprises. An innovation centre further acts to promote smart city by presenting the latest solutions at forums, training, seminars and exhibitions.

Technology and social innovation - smart city the citizen centric way ?

Cities bring people together to live, work and play. Together they intensify the ability to create wealth and ideas. If we can harness the collective power or wisdom of the citizens and get them involved in the process of improving cities, it may be possible to avoid or reduce the incidence of failure in smart city projects. We could achieve the ultimate goals of cities which are sustainable growth and making citizens happy and fulfilled.

"Perhaps if we can create a meeting of minds for local authority, government, city planners and citizen (who may have an idea, a business or just a desire) to

collaboratively explore ways technology can improve cities and make their city more sustainable and a better quality of life?"

Facilitating ideas will promote social innovation through the combination of technology and people and by catalysing cross-sector collaboration among government, civil society, industry and the academic community. New ways to make the most of their collective brain power – from telephone and smart phones, to broadband and online platforms, and open city data sets can bring them together to solve complex city problems. The city then becomes a living laboratory for smart technologies.

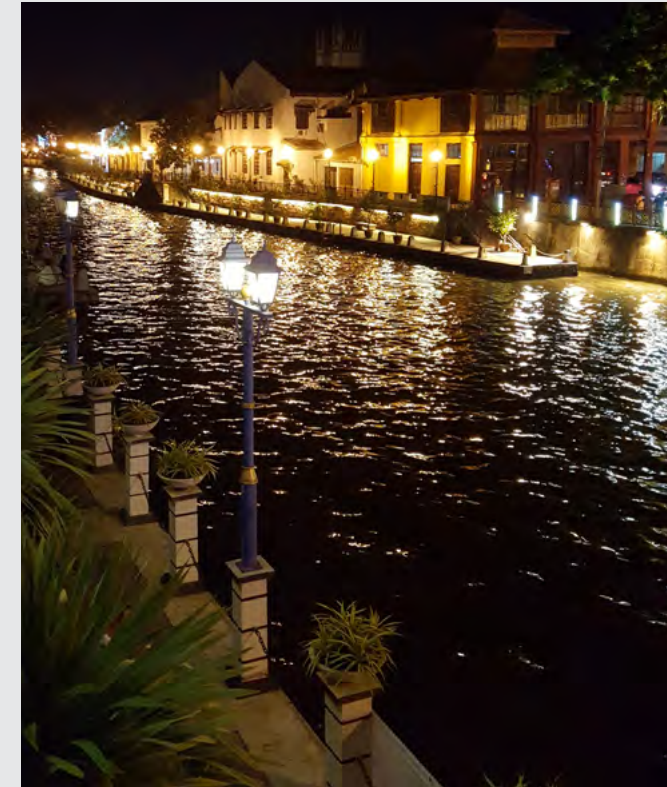
Some example results from social and technology innovation taken from Rethinking Smart Cities From The Ground Up, Nesta, June 2015 report:-

OpenStreetMap: Individuals and community groups can use low-cost

environmental sensing kits like the Smart Citizen Kit from Intel to measure air pollution and upload the data to create crowdsourced maps. This data can supplement professional sensing networks in the near future.

Egg - An app compiling data about air quality by selling a cheap sensor which people put outside their homes where they collect readings of green gases, nitrogen oxide (NO₂) and carbon monoxide (CO). The data is sent to the internet where it is integrated on a map to show pollution levels around the world.

'I love Beijing' - an app to report issues such as broken streetlights and potholes to the city government. The app extends the features offered by successful issue reporting apps like FixMyStreet in the UK, by also including a map of the city's informal food markets. Residents can add a range of information to the map including opening times, new markets and what type of goods they sell.



Don't Flush Me - neat little DIY sensor and app which is single-handedly helping to solve one of New York's biggest water issues. Every time there is heavy rain in the city, raw sewage is pumped into the harbour, at a rate of 27 billion gallons each year. Using an Arduino processor, a sensor which measures water levels in the sewer overflows and the app lets people know when it is 'safe to flush'.

Sharing City Seoul initiative - In Seoul, the city government is helping residents make better use of the things they own. It has supported a range of projects from local car-sharing company SoCar to websites like Billiji that help people share things with their neighbours.

'Madame Mayor, I have an Idea' - is a crowdsourcing and participatory budgeting process that lets citizens propose and vote on ideas for projects in Paris. The process allocates 500m Euros between 2014 and 2020.

Summary and conclusion

We discussed the urbanisation trends happening worldwide that create large cities, which have become major engines of innovation, economic growth and technological progress. With the growing population, they face important challenges of sustainability and quality of life. ICT and digital technologies can address many of them, making the city 'smart or clever'.

Smart city changes the way governments, enterprises and people interact, enabling quick and intelligent response to all kinds of demands of citizen's livelihood, environment protection, public security, urban services and industrial and commercial activities. It improves urban efficiency, and outlines a vision for a better quality of life.

We have further explored a Common Standard Framework for smart city with its six characteristics/ dimensions and the trends and market potential. Use of standards is crucial to promote mass market and interoperability. We further took a look at harnessing the power of citizens in smart city development to ensure better outcomes in addressing complex city challenges. Tapping the power of citizens in smart city development will further enrich citizen's lives, uplifting their potential to partake in the prosperity that is generated. It rings in harmony with the theme for the 11th Malaysia Plan (2016-2020), 'anchoring growth on people' the final leg towards realising Vision 2020.

Malaysia has a number of smart city aspirants with cities like Malacca, Iskandar, Cyberjaya and Putrajaya already in the game. There is also the smart community project expansion plan by MCMC in collaboration with the state and local authorities in identifying a digital champion in at least one district in every state to work with following the successful pilot in Kemaman, Terengganu (<http://www.skmm.gov.my/Resources/Publications/Smart-Community/Smart-Community-@Kemaman.aspx>).

At the fundamental level, smart city market presents an important and attractive opportunity for telecommunications service providers to provide the anchor. Machine-to-machine (M2M) and IoT are the basis for many smart city services and smart metering too play an important part in the smart city infrastructure. Telecommunications service providers can gain from growth opportunities rendered. Collaborative partnerships will likely be required to enable telecommunications service providers access to smart city expertise. The Government has also placed a significant emphasis in the 11th Malaysia Plan on ICT as an enabler of the knowledge economy. Telecommunications service providers need to position themselves to take full advantage of it – nurturing innovation and opening up opportunities for future growth.



9 Winning in this Age of Disruption

How Breaking All The Rules of “Competition” May Be Your Ticket to Success

Roshan Thiran
CEO,
Leaderonomics

In Peter Drucker's 'Post capitalist Society', he wrote: "Every few hundred years in Western Civilization, there occurs a sharp transformation ... Within a few short decades, society rearranges itself - its worldview; its basic values; its social and political structure; its arts; its key institutions. Fifty years later, there is a new world, and the people born can't even imagine the world in which their grandparents live and into which their own parents were born."

Many people do not realise that we are in the midst of this new world being shaped. A few weeks ago, I was having a discussion with a prominent Malaysian CEO and our discussion led to how difficult it is to win in the internet game.

"It's almost impossible to win in the web market. We're trying so hard build our business. We try to kill our competition but they seem to be mushrooming everywhere!" the CEO said.

What this CEO failed to realise was that in the new world that is shaping, the way to win is going to be significantly different. Instead of killing competitors and fighting competitors, the new world requires a new set of skills for leaders. Even if you kill all your competitors, you may still end up losing as the traditional competitive model is growing increasingly obsolete with each passing day.

In the old days, the way to win in business, politics and almost anything was to defeat your enemy or "win the competition." Once your competitors are defeated, victory is assured. From Alexander the Great to the 15th century Spanish army, they shared the same "defeat your enemy" and win philosophy. When the Europeans came to the Americas, they defeated all the native Red Indian tribes by usually killing their leaders. When the leader was eliminated, the tribe usually crumbled.

The same holds true in business in the past – Komatsu tried to beat Caterpillar, Pepsi and Coca-cola were at each other's throats, and GE and Siemens battled for supremacy in a number of industries.

Even in the technology space, we see the same drawn-out battles – Apple vs Samsung, Microsoft vs Google and the list goes on. While each has tried to outwit the other and defeat the "enemy", the new world order calls for a different set of rules of engagement to win.

In 2005, MGM and other major entertainment companies like Disney, BMG, Sony, and Virgin Records, hired the best lawyers to sue Grokster, a small company that provides peer-to-peer (P2P) services, which basically allow users to share all types of files (music, movies, software) over the internet.

Before that, they sued Napster, then run by an 18 year old named Shawn Fanning, who set up his site to allow people to share files for free. Napster went bankrupt after the suit.



After defeating Grokster, they sued Kazaa, eMule, eDonkey and the big music companies kept winning. And then they started to sue individuals who were downloading music illegally. But even though they kept winning law suits, to their dismay, piracy didn't stop. It didn't matter how hard they tried. Piracy only proliferated and more P2P companies were set up all over the world.

But in the midst of all that emerged one clear winner – Apple. Instead of fighting the new model and trying to "kill" P2P applications, Apple adapted the original P2P model but made it legal. Recognising that the downloading trend was here to stay, Apple struck a deal with the recording labels and production houses to allow users to download files at marginal fees via its i-Tunes.

Apple reinvented the conventional model and built a collaborative model. The result? Apple emerged a clear winner with US\$1.9 billion in new revenues, and a 30% profit margin. While all the other music and recording houses were busy fighting this disruptive effort to share files and music, Apple took advantage and hit a home run.

If we go back to the example of the Red Indians in the Americas being defeated by the Europeans coming into the new land, we will find one Indian tribe that could not be defeated for almost 200 years – the Apache tribe. First the Spaniards tried to bring the might of the huge army to defeat this small tribe, then others tried in vain. How did they survive for so long? Interestingly, they had a collaborative leadership model. Leaders, whom they called Nant'ans, kept

changing. You may have heard about Geronimo, a famous Apache Nant'an, who never commanded an army but was instead a cultural or spiritual leader. Whenever a Nant'an was killed, a new one emerged, not by appointment but by a collaborative choice process. People followed a Nant'an simply because they wanted to and not because they had to. This collaborative leadership model enabled the Apaches to continue being a pain to the European conquerors and to survive.

Many CEOs today lead via the command and control mode. The collaborative leadership model is about leading in an encompassing manner – by ensuring everyone is participating in the leadership process.

Interestingly, many new successful businesses today have begun to adopt



Leader is best when people barely know that he exists; not so good when people obey and acclaim him; worst when they despise him.”
– Lao-tzu

similar collaborative leadership models. There is collaborative innovation where organisations choose to allow their customers and anyone in the world to collaborate with them on products and new ideas. There is collaborative marketing, collaborative journalism and even collaborative software development happening today.

There are new collaborative business models where an entire business is run not by a CEO and his staff but by the general public. And there are even organisations that allow copyright protected material to be made generally available for free to anyone in the world to modify and use those materials and redistribute them back into the community or other organisations.

This has caused disruption simply because everyone can participate in

both creation, curation, marketing, distribution and deployment of product and services. This presents far-reaching opportunities especially for small businesses here in Malaysia and ASEAN.

Not just tech companies but everyone

Collaboration is not just limited to IT or technology companies. Southwest Airlines and Air Asia have both successfully engaged their customers to collaborate with them to lower their costs. They have empowered their customers to download and print their own airline tickets from their email. And customers don't seem to mind that work is being passed over to them.

Many CEOs today share their “secrets” with the public and gain tremendous input and feedback on their plans and tweak them accordingly.



The idea of sharing ideas and innovation between companies and competitors is against every business rule book in the world. In-house R&D is traditionally protected fiercely, as any subsequent innovation has to be protected in order to provide the company with the opportunity to make back (hopefully with profit), the initial expenditure spent. In this context, the idea of opening the closed doors of propriety information for others to learn from would seem foolhardy, and yet companies that have embraced open innovation (as it is termed), are reaping rewards. Today, information can be transferred so easily that it seems impossible to prevent. Thus, the open innovation model states that since firms cannot stop this phenomenon, they must learn to take advantage of it.

In 2000, Rob McEwen, chairman and CEO of Goldcorp in Canada, completely changed the gold mining world when he triggered a gold rush by issuing an extraordinary challenge to the world when he opened all his secret propriety data online and asked the world to help him study the data and find out where the next 6 million ounces of gold were. And he offered a prize of \$575,000, in his Goldcorp Challenge.

McEwen knew that the contest entailed big risks as it exposed the company to a hostile-takeover bid and also exposed all his secret propriety information gained over many years. But he knew that the risks of continuing to do things the old way was worst. He knew if he could attract the attention of world-class talent to the problem of finding more gold, he would tap thousands of minds which would speed up exploration and improve his odds of discovering gold.

His risk paid off when Australian Nick Archibald and his team, who had never visited Canada, used 3-D software to identify key areas to mine. And Goldcorp grew from mining 53,000 ounces in 1996 to 504,000 ounces in 2001. Not only did the contest yield copious quantities of gold, it catapulted his under-performing US\$100 million company into a US\$9 billion juggernaut while transforming a backward mining site in Northern Ontario into one of the most innovative and profitable properties in the industry. This astounding success made him and of course, his shareholders happy. One hundred dollars invested in the company in 1993 is worth over \$3,000 today.



His challenge attracted world attention and McEwen received entries from not just geologists but also graduate students, consultants, mathematicians and military officers, all seeking a piece of the action.

Leaders who embrace this new collaborative model understand that the new model of success is not built on “killing the competition” or a “we-win but they-lose” model, but one of collaboratively engaging the world to help you win in a big way. Even if Goldcorp managed to hire the best 100 geologists in Canada to help them find gold, the collective wisdom of the “world” would always produce better output and more innovative approaches. It is not about hiring innovative geologists but being innovative enough to engage “the world” to help you innovate and win.

What does this mean?

A survey by the Economist Intelligence Unit (EIU) in January 2007 stated that: “Collaboration is crucial to IP value maximisation. It is now beyond the means of any single company to monopolise the best knowledge of any particular industry. Realising the full potential of ideas means letting

them flow in and out of organisations to where they can be most efficiently handled at each stage of their development.” Unilever has created a whole new business at ideas4unilever.com where they source the best ideas and IP from all over the world and then partner with the idea generator to build a business around the idea.

So how can I apply this idea of collaboration to my business? It’s a simple concept to incorporate into any business -- you have a problem, need a plan, your best bet is often to throw together a group of disparate but talented individuals and let their collective creative energy go to work. The reason collaboration works so well is a combination of passion and purpose. And for best results, your pool should be full of people who deeply care about the issue and have a vested interest in solving it. Wikipedia, Mozilla, Goldcorp all used collaboration to great effect, so you can too!

Not many people in Malaysia have heard of The Huffington Post, but it has become one of the top internet newspapers around the globe. It has huge reach and unlike the New York Times, which has 1,332 newsroom employees, Huffington Post only employs a total staff of 50 people.



It has more than 1,800 volunteer writers worldwide and has grown into a major online newspaper just by leveraging the power of collaborative journalism. And you see examples of businesses thriving everywhere by adopting this collaborative model. But can we leverage this in Malaysia? Waze has successfully done it. Can the rest of us learn how to leverage everyone to benefit us?

Winning in this new game

Is this collaborative-based system new to the world? In the early existence of humans, the tribal system of collaboration and cooperation, based on trust and kinship, was a norm. This system predates the emergence of power-based hierarchies and competition-based systems we know today.

Even in modern times, the effectiveness of grassroots movements, such as Alcoholic Anonymous (AA), has reached untold millions with only a shared

ideology and without a leader. The achievements of these organisations, like Craigslist and the original Napster, which were run totally by their own customers, highlight that future success may come down to how well you collaborate in the world.

The internet has created a collaborative infrastructure and interface for the 21st century. The question leaders in the 21st century will be asked is have they focused their time, attention and brainpower to engage, connect and tap “all of us” in the world to work together to help your organisation win and grow like never before. Engaging the world to collaborate with you is going to be the leadership skill required to win in this brave new world. “Collapetition” is going to be the way things get done in the future. The only question is: Will it be done by you or to you?

The key to leadership in the 21st century is not how you can get the best talents into your company to work, build, sell

and make money for your company, but how you can get all talent from across the world to simultaneously build, grow and enable your organisation to win in the world. The skills of leadership for the 21st century will be about getting everyone in the world to partner with you. It will be about sharing everything you have with everyone and trusting people to support and grow with you. It requires a different leader who doesn’t lead with a title but leads with their passion, heart, commitment and bravery. Can you be that leader?

Roshan Thiran is currently CEO of Leaderonomics, a social enterprise focused on bringing disruption to the leadership development space. He spends countless hours doing leadership research and interviewing leaders to pick their brains. To watch his interviews and TV shows, go to www.leaderonomics.com or follow him on LinkedIn or Facebook at www.facebook.com/roshanthiran.leaderonomics

10 Shifting Sands in the GBS Regional Scene

Outsourcing Malaysia

Ties between the Philippines and the US have come under strain following a statement made by President Rodrigo Duterte in Beijing recently: “Philippines will break up with US”. Duterte embracing his sovereign foreign policies made a strong stand that he may follow the footsteps of Russia and China in upholding supremacy of inter-government relations. Obviously, that statement is motivated by a political agenda and we have heard a lot of these ‘throw away’ statements in the recent US presidential election.

However, the impact is immediate with some US companies operating in the Philippines threatening to move their business elsewhere should such political sentiments continue. Given the current environment, it is imperative for the multinational companies operating in the Philippines to ensure that their business continuance is ensured. Two approaches to ensure business continuance; move the entire operations or carve out a critical component of the service and move it to other shores, such as Malaysia. BAU (Business As Usual) is certainly not an option at this stage.

Often, the main reasons cited for moving of US, Japanese and Western European operations, in particular back office processing activities, to Asia are lower wages and operating costs in these countries. Although cost is among the top deciding factor for selecting outsourcing destinations, the final decision still weighs in the geopolitical risks and alliances within a chosen region. A change in country leadership with different views can cause upheaval especially to the Global Business Services (GBS) industry as it is supporting a global landscape of clientele and any local ramifications will also result in far-reaching ripple effects beyond the borders.

Characteristics of a preferred GBS destination

The preferred destination for outsourcing requires long-term stay and commitment. Failure to choose the appropriate location can result in an adverse financial impact and loss of fundamental operational abilities.

The following provides eight key characteristics of a preferred outsourcing destination which are self-explanatory:

- Government support and incentives; and ease in cutting through red tape;
- Availability of talent pool;
- Geological stability;
- Strategic time zones;
- Matured and stable infrastructure (physical and technological) including reliable high-speed connectivity and security;
- Robust and adequate laws for copyright, royalty, intellectual properties and confidentiality protection;
- Good track record with economies of scale;
- Robust political framework (regulatory, judiciary, etc).



The regional GBS delivery challenge

As a conducive and vibrant business environment at the center of this cauldron called Asia, Malaysia is strategically located in the vicinity of countries in Southeast Asia, East Asia, and also the Middle East. ASEAN alone boasts a massive 600 million population and according to the Asian Development Outlook 2016 report by the Asian Development Bank (ADB), developing Asia is poised to grow at 5.7% for 2016 and 2017 despite the global headwinds and a slowdown of the Chinese economy.

Malaysia faces stiff competition from countries on a linear grid, such as India and Philippines as more

countries are emerging with a “low cost” value proposition including those that are closer to home like Thailand, Cambodia and Vietnam. Malaysia has been successful thus far in attracting foreign investments in the Global Business Service industry, due largely to its inherent low-cost base, good infrastructure, multilingual capabilities, and more. Furthermore, increasing operating costs and retention of talents are prevailing issues faced by the service providers.

A more “disruptive” value proposition is needed to stay ahead of the curve, by transforming into a high-value based service provider. A high-value based model will collectively encompass knowledge, talent pool, top class

technology-enabled infrastructure and a comprehensive legal framework on intellectual properties to name a few. Hence, it is imperative that in addition to tackling the customers’ tactical objectives which normally include cost reduction, expenditure control, resources constraints and other financial-related or immediate impetus; you must address the strategic intent which is the longer-term focus. This can include capturing additional market share by being nearer to their customers, access to specific talent resources – knowledge base, risk mitigation and rapid re-engineering of key business processes.

GBS providers in Malaysia can still leverage on a low-cost model

proposition, especially when they are targeting to attract businesses from high-cost countries based on wages. From a cost base arbitrage value proposition, the conversation must then lead to the next level of high-value offerings such as those mentioned above.

Finally, how one demonstrates these value propositions, country credentials and track record is crucial. Customers’ reference and independent reports from researchers and consultants are often relied on for validation and strengthening of the final business case. For example, Malaysia being ranked the 23rd (2nd in ASEAN) for ease of doing business in 2016 by World Bank is an extremely powerful credential.

Role of Government

Over the years, the Malaysian government has played a significant role in shaping the growth of the GBS industry by taking progressive economic measures, investing and nurturing the industry for over 10 years. Malaysia is facing steep competition from regional competitors who are offering similar services and are strategically

positioned for a larger piece of this opportunity. It is imperative that the Government through all its bodies and agencies, make further investments to deepen and strengthen the Malaysian value proposition.

Benchmarking the countries in ASEAN

The table below shows the ranking index for Malaysia and four other

countries in the region. The ranking comprises the Peace Index, Gross Domestic Product (GDP), Education, Internet, Ease of Doing Business and Environmental Performance. Not surprisingly, there is no mention of cost; and apart from Singapore, the other countries’ ranking are almost the same. It would be quite difficult to “pick” the winner from this race by only considering this ranking index.



Country	Global Peace Index (Rank)	GDP Growth (%)	Higher Education (Rank)	Internet penetration (%)	Ease of doing business (Rank)	Environmental performance (Rank)
Thailand	126	2.8	37	43	46	91
Malaysia	20 (*1)	5 (*2)	27 (*2)	68.6 (*2)	23 (*2)	63 (*2)
Singapore	23	2	21	82.5	2	14
Philippines	133	5.8	46	43.5	99	66
Indonesia	63	4.8	37	20	91	107

Table 1: Ranking Index.

Source:
2016 Global Peace Index, 2015 World Bank
2016 QS Higher Education System Strengths Ranking
2016 Internet Live Stats
2017 World Bank, Ease of doing business
2016 Environmental Performance Index
*(#) Malaysia's Ranking among the 5 countries above.

GBS opportunities in the region

Table 2 provides a snapshot of the different IT spending targeted within the ASEAN countries, bearing in mind that collectively ASEAN has a 600-million population and can provide economies of scale for any businesses. While each of the ASEAN countries is aspiring to lift their economy and welfare, each has a different focus and priorities. However, there is one thing in common; these are all ICT and IT related expenditure. The biggest compound annual growth rate (CAGR) can be seen in the Philippines and Myanmar, both displaying double digit growth. They are perhaps late technology adopter nations while the more matured country like Singapore are already investing in services analytics software.

Looking at this table, the opportunity cycle pattern is also obvious, from hardware, software, services to analytics software. The key question is, with such a widespread demand landscape, what is an appropriate business model that is versatile and scalable enough to cope with the dynamism of this industry in the ASEAN region. Another potential threat will be; any one of these countries may rise

up and challenge Malaysia in the GBS industry in the years ahead.

The Global Business Services Outlook Report 2015 highlighted that the GBS industry was worth US\$670 billion in 2014 and Asia Pacific has the largest market share at 36% or US\$240 billion and this is still growing. Opportunities are certainly ample in the region.

Towards a high-value & niche services spectrum

It was reported in 2015, 19 years since the inception of MSC Malaysia, that more than 80,000 knowledge workers have been employed. Malaysia is proud of its multilingual value proposition from the 200,000 multilingual graduates it produces annually. These numbers reflect the need to build the right competencies in specific areas of expertise, in niche and technical skills and in churning out a sufficient number of ICT-related graduates to cater to the GBS market.

The Malaysia Digital Economy Corporation (MDEC) is set to drive the industry's next phase of development and

Country	Value (USD) by 2019	CAGR %	Purpose
Thailand	13.6 billion	3.7	Hardware and IT services.
Malaysia	16.8 billion in 2016	6.5	Software and IT services
Singapore	Forecast of 22.2 billion in 2016	4.8	IT services, analytics software
Philippines	6.6 billion in 2015. Estimated 7.1 billion in 2016	10	Hardware, smart devices and security systems
Indonesia	18.8 billion	9.2	Hardware and IT services
Cambodia	259.9 million	6.6	Hardware
Myanmar	256.4 million	12.5	Hardware
Vietnam	5.9 billion	4.5	Hardware and software

Table 2: IT spending by country in the ASEAN region

Source: Digital New Asia and Gartner



subsequently move Malaysia up the value chain with its focus on the high-yield Knowledge Process Outsourcing (KPO) sector. KPO types of activities and services are highly encouraged with new investments to further develop niche areas such as expanding engineering and design services to the oil & gas industry, and beyond.

The global KPO services segment is estimated to grow by more than USD50 billion in 2017, comprising services such as intellectual property research for patent applications; equity research, business and market research; legal and medical services; training, consultancy, and research; and development in pharmaceuticals and biotechnology; and animation and design. Niche services can include providing technology enablement and process improvement services, value-add and end-to-end processes, co-owner analytics, technology optimisation and automation, and cloud delivery components. With such service offerings, Malaysia is poised to accentuate the value curve and is able to compete with world class GBS nations.

Getting to the top of the list!

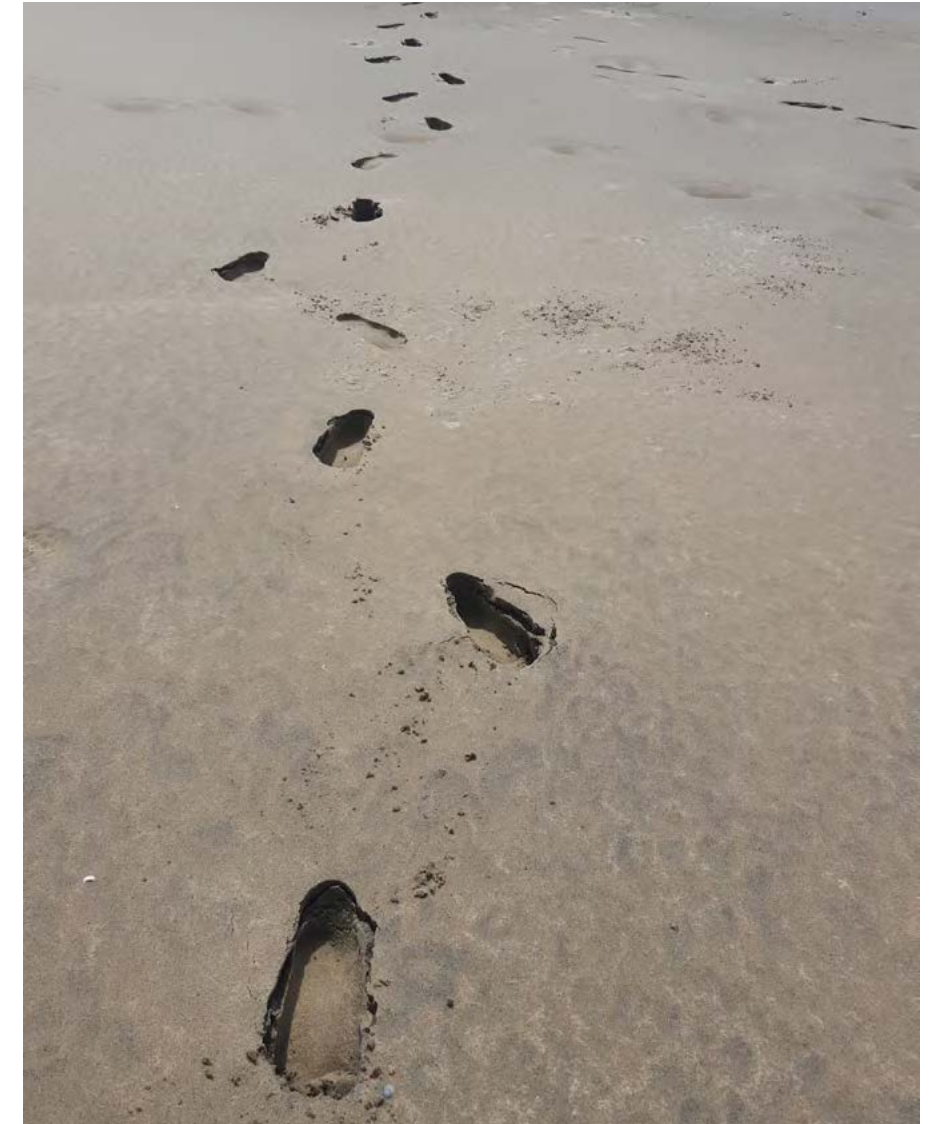
Malaysia, which is the third largest economy in Southeast Asia and 27th largest in the world, is emerging as one of the most stable global economies. The GDP of the country has been growing steadily for the last 15 years at an annual average of 5.6%. The Government plays a significant role in shaping the growth path of the country by taking progressive economic measures and investing in the growing industry sectors.

The socio-economic indicators of the country are relatively better when compared to the rest of the countries in the ASEAN region. The unemployment level in the country is about 3%, and inflation has been sustained at about 3% in the last two years. According to the World Bank, per capita Gross National Income (GNI) of the country is also among the highest in the region at USD10,579 in 2015.

Driving on the back of the Islamic Banking, Oil & Gas, Electronics, Tourism and Services sector, the country is

on a steady growth path to become a developed nation in 2020. The international Finance Corporation (World Bank group) has ranked Malaysia 23rd in the world for ease of doing business. The ease of doing business index ranks countries against each other based on how the regulatory environment is conducive to business operation as well as protection of intellectual property rights. Economies with a high rank (1 to 20) have simpler and friendlier regulations for business and the country falls in the upper middle income category within the East Asia & Pacific region.

Hence the situation – Malaysia is already a top preferred destination for GBS, as proven by the likes of large multinationals such as HSBC, Dell, and others. Are there greater opportunities in the region? Absolutely YES! But getting there may not be a straight and easy journey as the entire region of 600 million is also targeting to reach that top position! Staying ahead and on top of the competition, will require dedication and grit on the part of the Government and the GBS providers.





11 Leveraging on Disruptive Technology:

The Malaysian Public Sector
ICT Strategic Plan 2016 - 2020

Dr Suhazimah Dzazali
Deputy Director-General, MAMPU

Digital technologies like social media, mobile, digital platform or cloud, analytics and connected devices combined with volatile, fast changing and unpredictable demand of the citizens or markets are what enterprises all over the world are facing.

The Malaysia Public Sector is rising to the challenge of disruptive technologies mainly via a digital-based public service delivery system. The 11th Malaysia Plan 2016-2020 is clear in setting the strategic direction for a more citizen-centric service delivery. Five focus areas have been identified in the Plan to transform the Public Sector to become more efficient and productive.

The Public Sector ICT Strategic Plan (PSISP) 2016-2020 outlines the strategic direction of the implementation of ICT in the public sector for the next five years. This plan is aligned to the aspirations set in the 11th Malaysia Plan and other national-level policies. The PSISP emphasises on strengthening the efficiency and effectiveness of services, thus enabling a high-impact delivery system. This plan introduces a new ICT Vision in line with the agenda of Government transformation towards a developed nation by the year 2020. In addition, it also outlines strategies and programmes to provide guidance to ministries/agencies in the planning and implementation of ICT initiatives in their respective agencies. MAMPU, being the lead for ICT implementation in the public sector, developed the PSISP 2016-2020 to align the ICT implementation to agencies with ICT agendas for the public sector.

Themed “Citizen Centric Digital Services”, emphasis is on prioritising citizens needs related to Government service delivery, thus ensuring citizens from all walks of life enjoy a better Government service. The PSISP 2016-2020 framework (Figure 1) consists of four main components to support the success and sustainability of ICT initiatives:

- ICT Vision: “An Inclusive Digital Government Spearheading Citizen Centric Service Delivery”;
- ICT Strategic Thrusts, which are the strategic enablers to achieve ICT goals;
- Enabling Ecosystem, which encompasses the strategic elements to support/enable the successful implementation of ICT initiatives; and
- Basic Principles, which are the underlying guiding factors in ICT implementation.

The ICT vision will be achieved through five strategic thrusts, which are the strategic drivers to ensure optimum usage of ICT to achieve maximum benefit and results.

Strategic Thrust 1: Integrated Digital Services

- The Objective is to provide quality

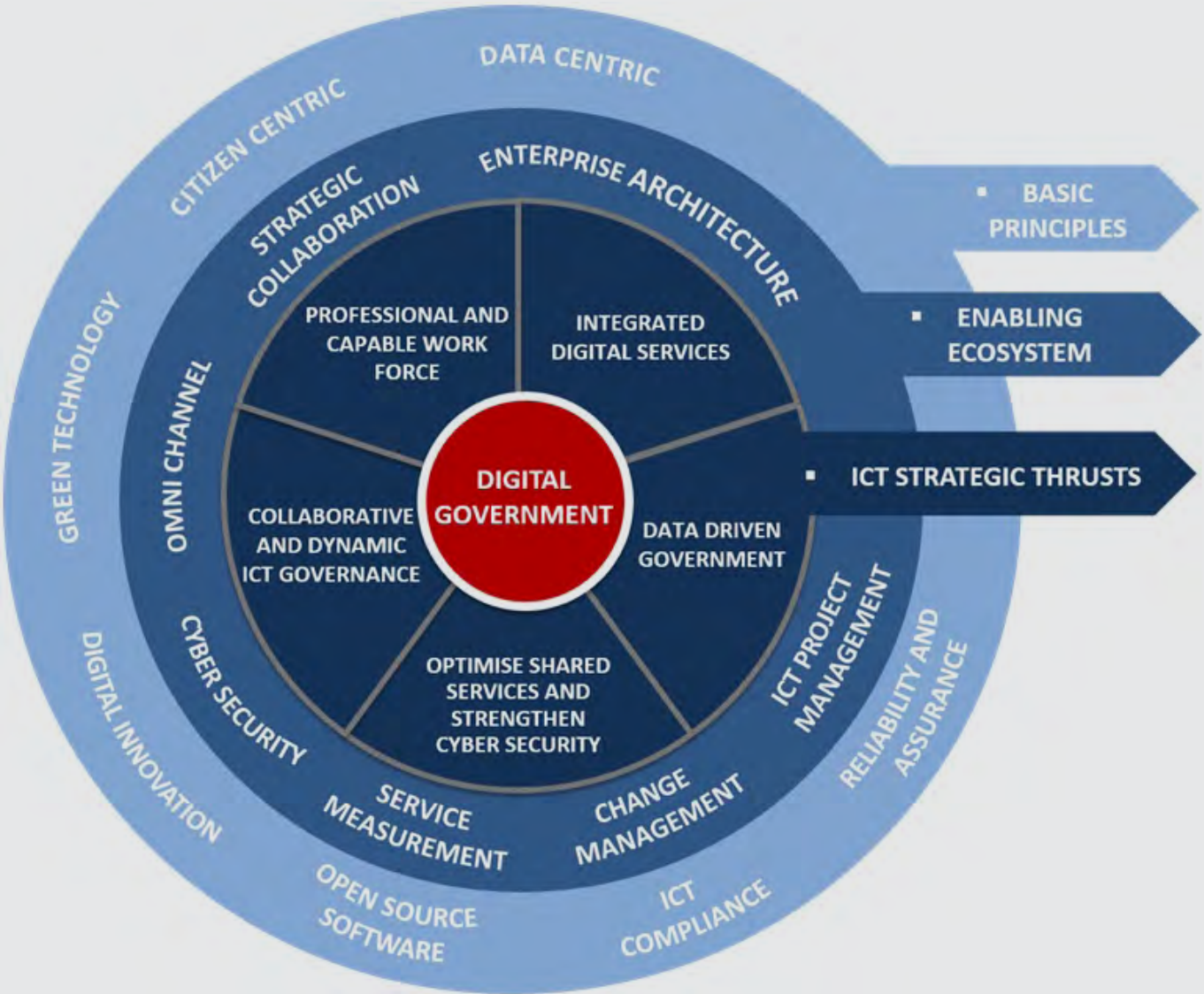


Figure 1: PSISP 2016-2020 framework

end-to-end digital services that are inclusive, user friendly, seamless, meet the needs of the people and are citizen-centric, thus ensuring that citizens enjoy the benefits of using government digital services.

Strategic Thrust 2: Data Driven Government

- Focuses on managing and realising the value of data in a holistic and efficient manner through proactive and collaborative data management as well as strengthening cross-agency data sharing to increase the value and benefit of data. Rapid developments in ICT technology have enabled data to be managed more efficiently and effectively.

Strategic Thrust 3: Optimise Shared Services and Strengthen Cyber Security

- Objective is to increase sharing of ICT resources through a centralised and structured initiative and to ensure secure and trusted digital services. Shared services involving ICT infrastructure are key components for seamless service delivery. Improvement to the availability of high performance networks also enables data and information to be shared across agencies. Optimal use and managed resources increase the efficiency and quality as well as reduces the cost of service delivery. In the meantime, strengthening cyber security ensures a secure service access environment that can be trusted by the people when dealing with the Government.



Strategic Thrust 4: Collaborative and Dynamic ICT Governance

- Aims at strengthening leadership and governance for planning and coordination of digital initiatives. ICT management and organisation functionality are to be strengthened to become more dynamic and efficient. Strong, collaborative and dynamic governance strengthens decision making and improves the effectiveness in monitoring the implementation of digital initiatives in the public sector. This dynamic governance emphasises citizen engagement in providing their views and suggestions regarding improvements to the services offered.

Strategic Thrust 5: Professional and Capable Work Force

- Aimed at strengthening the capabilities of Public Sector ICT personnel as the credibility and capability of public sector ICT Personnel is key in enabling them to become leaders of digital transformation in the public sector. The high expectations of stakeholders and citizens as well as the rapid development and complexity of ICT technology requires capable and professional ICT personnel to lead

this transformation. The strengthening of management and career development planning will create competent, competitive and high-performing ICT personnel.

The implementation of the strategic thrust is supported by seven strategic components in the enabling ecosystem. They are:

- **Enterprise Architecture (EA):** Implementation of EA based on 1GovEA Framework;
- **ICT Project Management:** Using Panduan Pengurusan Projek ICT Sektor Awam (Guidelines for the management of public sector ICT projects - PPrISA) as the main reference;
- **Change Management:** Implementing change management for all new initiatives in the Public Sector;
- **Service Measurement:** Measuring the results and benefits of all projects implemented through Post Implementation Review (PIR) and Benefit Realisation Capture (BRC);
- **Omni Channel:** Providing multiple channels through which Government digital services are delivered to citizens;

- **Strategic Collaboration:** Forge strategic collaboration with other entities for sharing of resources, experience, expertise, and best practices; and
- **Cyber Security:** Ensuring Government service delivery is secure and trusted.
- **ICT Compliance:** Compliance to existing acts, policies and guidelines as well as ICT best practices;
- **Green Technology:** Practice and implement green ICT technology;
- **Digital Innovation:** Innovate digital services through business process reengineering/improvement; and
- **Open Source Software:** Inculcate the use of open source software as the first choice.

Implementation of all ICT initiatives or projects in the public sector should be based on the seven basic principles that have been identified. Compliance and practice of these basic principles will support and contribute to the success of ICT initiatives.

- **Citizen Centric:** Design and deliver services based on the needs of the citizens;
- **Data Centric:** Manage data as an asset and share data to provide added value to the services;
- **Reliability And Assurance:** Gain confidence and trust of citizens with reliable and secure Government digital services;

A total of 12 strategies and 30 programmes has been formulated to accelerate and strengthen the use of ICT to achieve the vision of the public sector as shown in Figure 2. Also outlined are action plans together with the leading agencies and agencies involved in the implementation of these strategies and programmes.

PSISP 2016-2020 is not only aligned with the 11th Malaysia Plan, but also takes into account the current ICT environment in the public sector, global economic challenges and the



Figure 2: Summary of Strategic Thrusts, Strategies and Programmes

aspirations of the country by 2020 as well as global ICT best practices. Global ICT best practices include the use of disruptive technologies. Disruption in technologies are certain. The key challenge is knowing what may be 'the next big thing.' It may be tempting to jump into adapting to a new disruptive technology, but it may be years before they are stable or they might fizzle out altogether. Disruptive technologies must be examined and evaluated to determine the cost and economic benefits. The disruption must fit into the comprehensive strategic business plan. It requires rethinking the entire business and not just the technology. Having a clear-cut IT strategy is key to establishing a competitive advantage.





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PIKOM, the National ICT Association of Malaysia, is a not-for-profit organisation. It is the largest association representing information and communications technology (ICT) players in Malaysia. Since its inception in 1986, PIKOM has come of age as the voice of the ICT industry. It has become an ICT referral centre for government and industry players, as well as international organisations. In this regard, PIKOM takes on the responsibility to publish ICT-relevant information in a periodic manner.

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