Thriving in the Digital Ecosystem

ICT Strategic Review 2018/2019

> “The final frontier of the digital technology is integrating into your own brain.”
>
> - Ramez Naam

10th EDITION

PIKOM

CHAMPIONING MALAYSIA'S DIGITAL ECONOMY

We are MDEC, the Malaysia Digital Economy Corporation.

We champion the Malaysia's digital economy. 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.

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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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MESSAGE BY THE PIKOM CHAIRMAN

GANESH KUMAR BANGAH

Malaysia's digital economy contributes an estimated 20% to gross domestic product (GDP) and is considered the fastest-growing component of the national economy. The domestic ICT industry is at the heart of this component, being the provider of products and services necessary to build and sustain the local digital ecosystem.

By its very nature, the digital ecosystem is an interconnected network of different sub-ecosystems linking people, businesses and institutions in a seamless manner to create an extensive and efficient layer of interaction. However unlike other ecosystems, the digital variant is an evolving platform fuelled by disruptive innovation of technologies. It is this constantly-shifting platform that requires individuals, organisations and institutions to be agile and adaptable in order to not only survive, but to also thrive.

To celebrate the 10th Edition of the PIKOM ICT Strategic Review 2018/2019, we have appropriately chosen the theme of *'Thriving in a Digital Ecosystem'*. This is applicable to the nation, its people and also PIKOM as an association representing the interests of the ICT industry.

This year's annual publication covers a broad range of topics related to the selected theme. I am proud to note that we have dedicated a section that sheds light into the vision and thoughts of our new Minister of Communications and Multimedia Gobind Singh Deo. Aside from his perspective, the report also expounds on current issues such as digital transformation, rapid urbanisation and accelerated innovation, digital entrepreneurship and also the digitisation of the workforce.

As in previous editions, we have also provided an economic and industry outlook for 2019. Overall, the publication is a must-read for ICT industry players as well as all other industries facing increasing digitisation.

I would like to take this opportunity to thank all parties involved in the production of this year's publication, and in particular our own PIKOM Research Committee for yet another superb effort. It is also my privilege to extend PIKOM's appreciation to our advertisers and contributors for your continuing support. Your support has been a key factor in the success of the PIKOM ICT Strategic Review 2018 / 2019.

EXECUTIVE SUMMARY

WOON TAI HAI
PIKOM Research Committee Chair

Welcome to the 10th edition of the PIKOM ICT Strategic Review of an ICT industry that has grown and evolved by leaps and bounds in the period since we first introduced this publication. The theme for each year is different and is chosen after careful analysis of the prevailing global trends and flavours of the industry. However, in each publication, we endeavour to incorporate relevant thought leadership articles, emerging trends, challenges, successes and outlook of the economy and ICT industry to share with business and public sector communities.

We hope that the reports can stimulate deeper thinking and call-to-action plans to strengthen the local industry. As the 'Voice of the ICT Industry', this publication (in addition to the annual ICT Salary Outlook report) is another effective channel that PIKOM has been leveraging on all these years to reach out to our members, industry and policy makers.

Today's society, industry and government are increasingly immersed in an evolving and developing digital ecosystem. Whatever activity we undertake and whichever process we employ invariably involves the use and aid of digital technologies. There is simply no escaping this new reality.

Yet, the real question we face is not the scale or scope of the digital landscape. It is whether we can survive and thrive in such an ecosystem. Like any new-age era, the digital world feeds on innovation to change the way we go about our daily business, making everything easier, faster and arguably, better. In doing so, the digital ecosystem constantly and consistently throws up opportunities as well as the inevitable disruptions and obstacles. Our struggle then is to navigate through or around potential risks while at the same time capitalising on the wealth of prospects in business or otherwise. In other words, we can choose to watch events and developments pass us by, or we can opt to be active and proactive participants and contributors.

The 10th Edition, with the theme of *'Thriving in the Digital Ecosystem'*, has been carefully put together to offer insights into the various elements deemed critical in order to thrive in a digital ecosystem. They are featured in five sections namely, Landscape, Perspective, Leadership, Workforce, Technology and also a Special Feature on digital tax, an often overlooked subject that is nevertheless important to sustaining the digital economy.

A dive into these respective sections will provide a better understanding of their relevance.

LANDSCAPE – A critical analysis of the Malaysian economy and the ICT industry into the next 12 months including a forecast of GDP growth for the country. They offer useful metrics for businesses and industry players in charting their plans for the next financial year. This section comes with three chapters:

- **ECONOMIC OUTLOOK IN MALAYSIA 2018 / 2019**
  Traditionally the first chapter in the ICT Strategic Review series, this chapter captures Malaysia's economic performance. It features a discussion on the many interesting factors, particularly political developments, that impact the domestic economy. Other issues touched upon include the scrapping of mega projects, reintroduction of the Sales and Services Tax, performance of the Ringgit as well as global developments such as the US-China trade war. The chapter also explores Malaysia's efforts to reach high-income status, with the target now revised to 2024.

- **ICT INDUSTRY OUTLOOK 2018 / 2019**
  The digital economy continued to grow its contribution to GDP in 2017, albeit at a slower than expected rate. Growth was especially robust in e-commerce of non-ICT industries but less so in the traditional ICT sub-sectors. The industry is poised to sustain growth in 2018 and 2019 largely as a result of the increasingly strong e-commerce of non-ICT industries.

- **ICT JOB MARKET IN MALAYSIA 2018 / 2019**
  Salary increases for ICT professionals appear to have moderated in the first nine months of 2018 although demand for specialised ICT skills continued to rise based on job openings advertised in Jobstreet.com. This chapter offers an extension to the ICT Job Market Outlook report that PIKOM publishes in the middle of each year.

PERSPECTIVE - Malaysia has a new Government led by a seasoned leader, but supported by many who are governing for the first time. This section provides a peek into the views and thoughts on ICT by the Minister of Communications and Multimedia Gobind Singh Deo.

- **GOBIND SINGH DEO: INTERNET FOR ALL**
  The Internet is a basic human right and needs to be accessible to everyone. In pushing this agenda, new Minister of Communications and Multimedia Gobind Singh Deo has been hard at work collaborating with a host of operators and service providers to extend the reach and affordability of broadband. He shares his thoughts in this chapter.

LEADERSHIP - With the evolution of disruptive technologies and the new generation of millennials entering the workforce, a critical question often asked by C-suite executives is what kind of leadership should I adopt and what traits are expected of my management team. Unfortunately, most leaders are not prepared for the challenge of leading through uncertainties and most organisations are still very ingrained towards rewarding based on predictability and control. This section offers readers an insight into what some global firms are doing to address the challenges of a changing environment, business models and workforce.

- **HOW TO BECOME A DIGITAL TRANSFORMATION LEADER**
  About 48% of Southeast Asia's GDP will be derived from digital products and services by 2021, according to Microsoft. In this chapter, the global software giant imparts timely advice on how businesses and organisations can carry out effective digital transformation by focusing on not only technology, but also business models and new ways of creating value for customers.

- **MEGAGRENDS: SHAPING OUR FUTURE**
  A series of megatrends including rapid urbanisation, changing demographics, hyper globalization and accelerated innovation is set to change the landscape in Southeast Asia. This chapter by HP reviews these megatrends and speculates on how they will change our way of life. It also outlines HP's strategy to help us thrive in these changing conditions.

- **THE RISE OF DIGITAL ENTREPRENEURSHIP WITHIN TODAY'S SHARING ECONOMY**
  Enabled by digital technologies, the Sharing Economy is becoming more pervasive. In this chapter, the Malaysia Digital Economy Corporation (MDEC) elaborates on its initiatives to develop and sustain digital entrepreneurs as well as efforts to convert traditional businesses to use crowdsourcing tools for their ancillary services.

- **WOMEN & TECHNOLOGY: THE IBM DIFFERENTIATOR**
  Women constitute only 54% of the Malaysian workforce, a relatively low proportion compared to some Southeast Asian economies according to IBM. In this chapter, IBM Malaysia champions the inclusion of more women into technology fields, arguing that a more gender-diverse workforce can empower and enrich organisations.

WORKFORCE - With the advent of technology, future jobs and skills have to be realigned. Our education system from primary to tertiary needs to be strategically revamped to meet these challenges. Global connectivity, smart machines and new media are just some of the disruptive drivers reshaping the working landscape and future skills need to contribute to the changing environment. This section is a very valuable read for readers although it may not provide all the answers.

- **THE HR DIGITISATION RACE: YOUR KEY TO DIGITAL SUCCESS**
  It's time for organisations to digitise their human capital, whether it is the creation of workforce mobility, gamifying the workplace or digitising customer experience and interaction. Persolkelly offers suggestions and recommendations on how to develop the digital work space of the future.

- **THE IMPORTANCE OF HR ANALYTICS AND WHY HR SHOULD EMBRACE IT**
  Companies are increasingly capitalising on analytics to expand market share or to improve cost-efficiency. JobStreet.com points out in this chapter that organisations should also leverage on analytics to gain a deeper understanding into their workforce and generate the best solutions to business issues.

- **IS HR REALLY GOING TO SEE A HUMAN VS ROBOT WAR? MYTH VS REALITY**
  In a second article, JobStreet.com examines the prospect of artificial intelligence tools taking over traditional human functions in managing human resources. The online employment company believes there is ample space for HR professionals to exist alongside technology.

TECHNOLOGY - Blockchain has been a term used prevalently in the last 12 months as a result of price fluctuations of Bitcoin this year. How many of us really understand this technology beyond its platform as a distributed ledger? Some anticipated uses of this technology are for digital payment, smart contracts, and database management systems. This section focusing on blockchain will hopefully clarify the nature and benefits of this technology platform.

- **BLOCKCHAIN: BUILDING A FUTUREPROOF BUSINESS**
  Businesses everywhere are prioritising transformation as the way into the future. To truly transform in order to thrive in a digital ecosystem, NEM believes companies must migrate from legacy business models and apply blockchain technology for greater transparency, better efficiency and enhanced digital security.

- **ANALYSING BLOCKCHAIN'S IMPACT ON TALENT MANAGEMENT**
  In another chapter on blockchain, Persolkelly Consulting offers its take on how the technology can enhance human resource management by for instance, improving the screening process and expediting decisions of recruiters and talent managers.

SPECIAL FEATURE - Tax is a subject that most of us would prefer not to talk about, but nevertheless, it is a very important element in a digital economy. The complexity here lies in the fact that some of the digital goods and services are virtual unlike brick and mortar items. Increasing cross-border activities often 'blur' the lines between tax jurisdictions. As such, it is important for the industry to have a better grasp on this sensitive subject so that policy makers can also be guided accordingly.

- **WHAT DOES THE FUTURE HOLD FOR DIGITAL TAX IN MALAYSIA?**
  In this chapter, the Institute for Democracy and Economic Affairs (IDEAS) explores the pros and cons of a digital tax and also recommends the form it should take in order to be beneficial to a wide spectrum of stakeholders.

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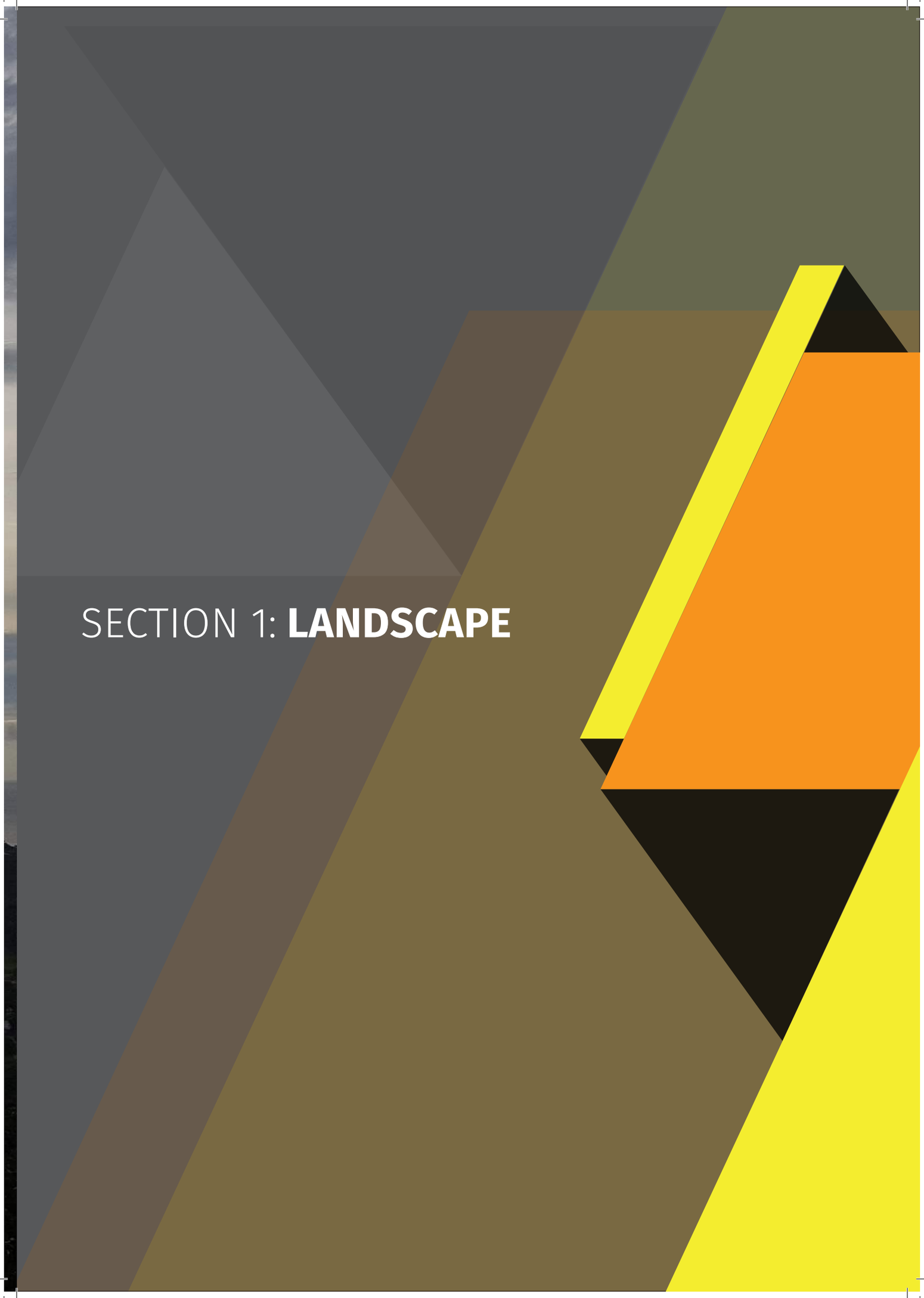

SECTION 1: **LANDSCAPE**

CHAPTER 1:

Economic Outlook in Malaysia 2018 / 2019

PIKOM

PREAMBLE

To date, 2018 has been an eventful and challenging year. Eventful to the extent of excitement over the unexpected change in government after 61 years; challenging due to the subsequent revelation of the nation's debt amounting to over RM1 trillion inclusive of contingent debts. This represents a debt-to-GDP ratio of more than 80.0% compared to 50.6% previously reported. Let us back-track 12 months and examine the forecasts of the various key metrics that monitor economic performance.

At this time last year, Bank Negara Malaysia reported Q3 2017 Gross Domestic Product (GDP) at 6.2%, the best performing quarter since Q2 2014. The Ringgit also strengthened against the US dollar throughout 2017, from a high of RM4.459 in January to RM4.078 in December. It even dropped to below RM4.00 in the first week of 2018. The GDP for the whole of 2017 was 5.9% **(Chart 1)**.

GDP growth for Q2 2018 was 4.5%, which was lower than the first quarter growth of 5.4%. In the first half of 2018, the GDP growth was 4.9% compared with a high of 5.7% in the same period of 2017 **(Chart 4 and Table 2)**.

The results of the Q3 2018 GDP is expected to be released on November 16. Even as we wait for the results, many financial institutions have already revised down their earlier projections for the whole of 2018. In August, Bank Negara had lowered their GDP projection for 2018 made in May from a range of 5.5%-6.0% to 5.0%. The World Bank cut their forecast from an estimated 5.4% in April to their October projection of 4.9%. The Malaysian Institute of Economic Research (MIER) recently revised down their 2018 GDP forecast to 4.7% from 5.5% announced in July.

At the recent Budget 2019 announcement by Finance Minister Lim Guan Eng, the government forecasted GDP for 2018 and 2019 to be 4.8% and 4.9% respectively.

As part of fulfilling the pledges of its election manifesto, the Pakatan Harapan government scrapped the Goods and Services Tax (GST) and reintroduced the fuel subsidies by re-fixing the 'pump' petrol prices. However, the abolition of the GST to make way for the reintroduction of the Sales & Services Tax (SST) is expected to create a shortfall of billions of Ringgit in revenue. Malaysians got a breather during the three-month tax holiday from June 1 to August 31 and continued to enjoy fuel subsidies for RON 95 and diesel.

On the global front, oil prices have jumped more than 40% since January 2017 mainly due to oil production cuts. They went up as high as US$86 a barrel in early October. It is obvious that this subsidy will cost the government more in the coming months; so it was no surprise that it announced that the subsidy petrol programme will only target lower capacity cars and motorcycles, and exclude luxury cars even for those below the threshold capacity.

In addition, the World Bank said recently that Malaysia is only expected to achieve high-income nation status between 2020 and 2024 as opposed to the previous target of 2020. The definition of high-income economies according to this financial organisation are those with a GNI/Capita of US$12,236 or more. Malaysia's current GNI per capita stands at US$9,660, short by US$2,576.

Malaysia's GDP Growth

National GDP grew by 4.5% in the second quarter of 2018 to RM300.1 billion compared against RM287.3 billion in the corresponding quarter in 2017. The

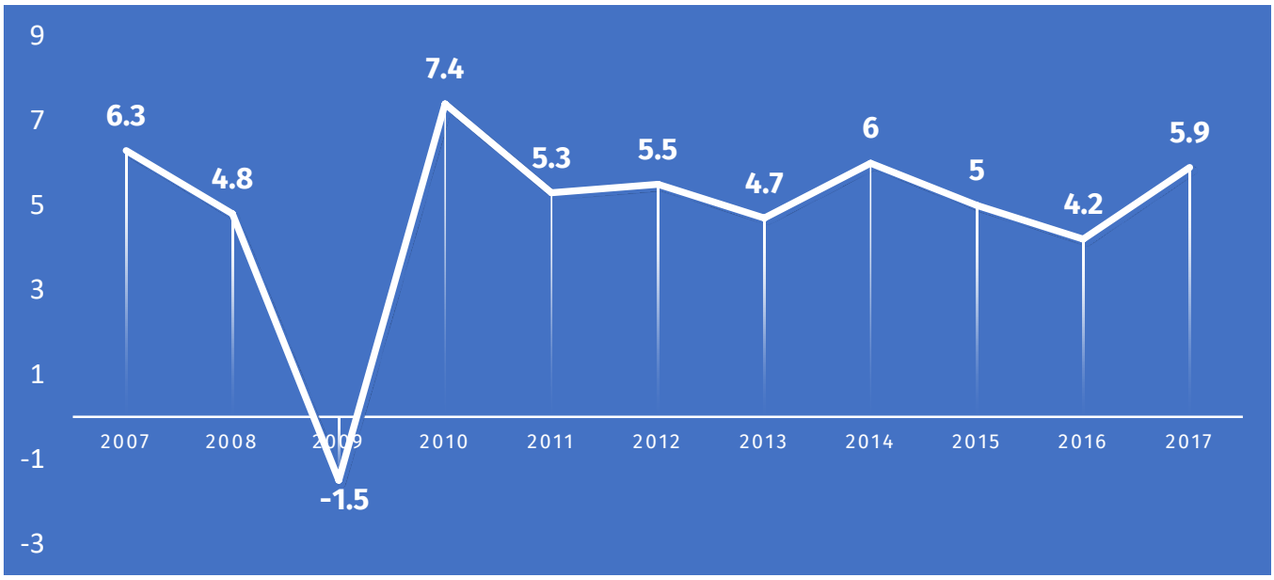

Chart 1: Annual GDP Growth Rate (%) (2007 to 2017)
Source: DOSM and Bank Negara

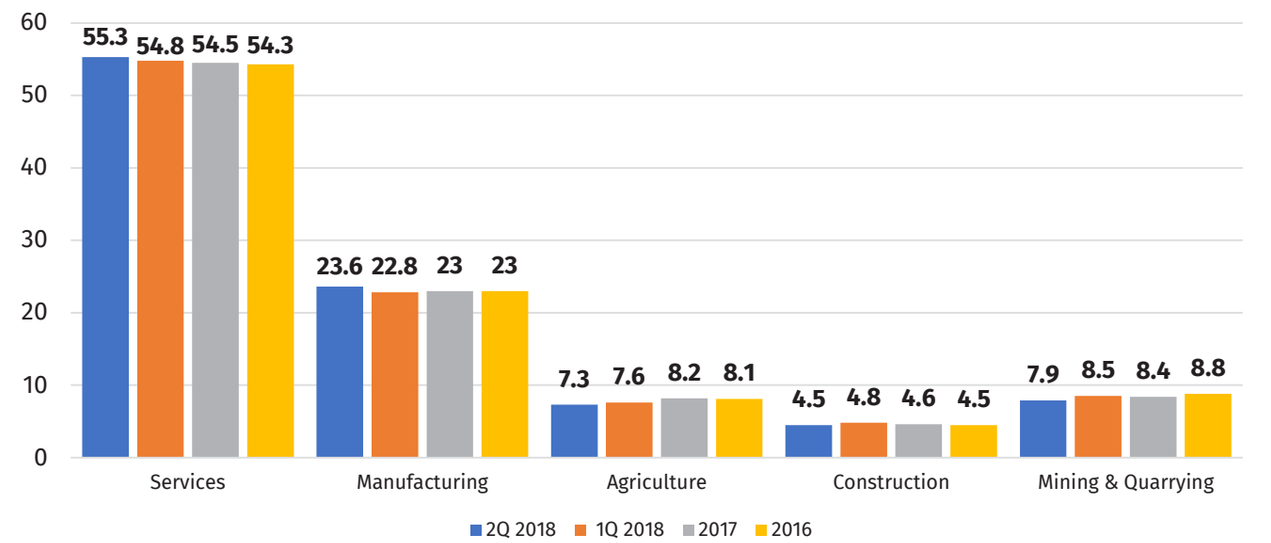

Chart 2: Share of Economic Sectors to GDP in 2016, 2017, Q1 2018 and Q2 2018 (%)
Source: DOSM and Bank Negara

Services sector contributed an estimated 55.3% to GDP with Manufacturing the second highest contributor at 23.6%. In terms of growth rates, the Services sector showed the highest growth at 6.5%, followed by Manufacturing and Construction at 4.9% and 4.7% respectively **(Chart 2 & Chart 3)**.

Bank Negara reported that the Agriculture sector contracted by 2.5%, hindered by production constraints and adverse weather conditions. Growth of the Mining & Quarrying sector in Q2 2018 was negative at -2.2% and this was due to supply disruptions.

Private sector activity was the main driver of GDP growth in the second quarter with both consumption and investment rising strongly at 8.0% and 6.1% respectively.

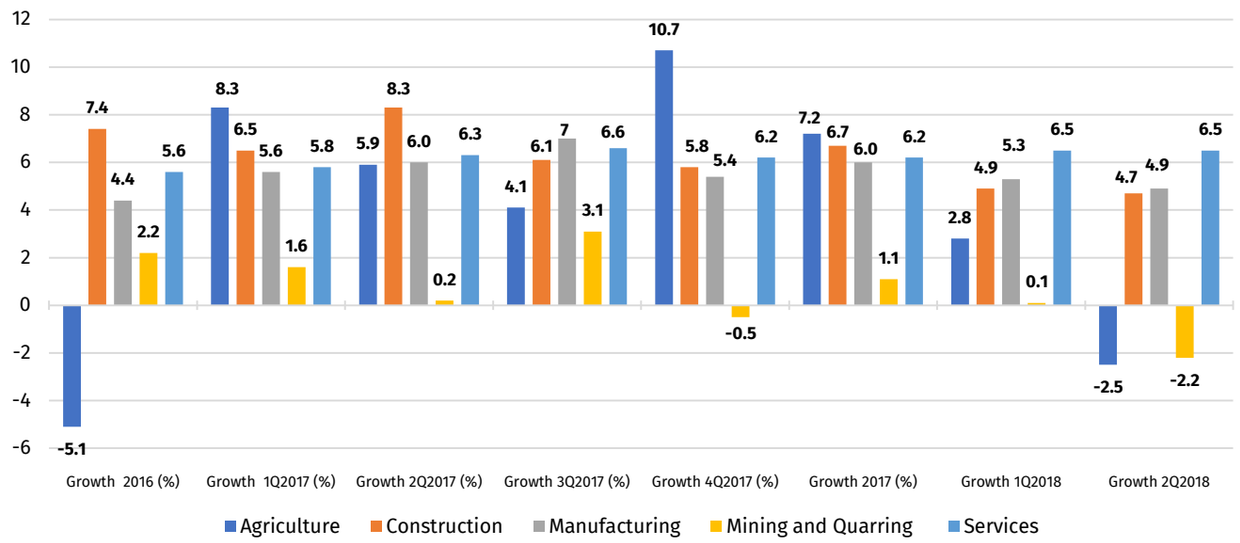

Chart 3: Growth Rate of Economic Sectors (%) (2016-2Q 2018)
Source: DOSM and Bank Negara

Annual Growth (%)	Share 2017 (%)	2017			2018		
		1Q	2Q	1H	1Q	2Q	1H
Services	54.5	5.8	6.3	6.1	6.5	**6.5**	**6.5**
Manufacturing	23.0	5.6	6.0	5.8	5.3	**4.9**	**5.1**
Mining and Quarrying	8.4	1.4	0.1	0.7	0.1	**-2.2**	**-1.0**
Agriculture	8.2	8.4	5.9	7.1	2.8	**-2.5**	**0.1**
Construction	4.6	6.6	8.3	7.4	4.9	**4.7**	**4.8**
Real GDP	100.0	5.6	5.8	5.7	5.4	**4.5**	**4.9**

Table 1: GDP by Economic Activity (at constant 2010 prices)
Source: Bank Negara

	Share 2017 (%)	2017		2018		
		2Q	1H	1Q	2Q	1H
		Annual Growth (%)				
Aggregate Domestic Demand (excluding stocks)	92.2	5.7	6.7	4.1	5.6	4.9
Private Sector	71.1	7.2	7.7	5.2	7.5	6.4
Consumption	53.7	7.1	6.9	6.9	8.0	7.4
Investment	17.4	7.4	10.0	0.5	6.1	3.4
Public Sector	21.0	0.2	2.9	-0.1	-1.4	-0.7
Consumption	13.0	3.3	5.3	0.4	3.1	1.8
Investment	8.0	-5.0	-0.9	-1.0	-9.8	-5.2
Net Exports	7.7	1.9	-6.9	62.4	1.7	29.9
Exports of Goods and Services	72.8	9.4	9.6	3.7	2.0	2.9
Imports of Goods and Services	65.1	10.4	11.7	-2.0	2.1	0.0
GDP	**100.0**	**5.8**	**5.7**	**5.4**	**4.5**	**4.9**
GDP (q-o-q growth, seasonally adjusted)	**-**	**1.3**	**-**	**1.4**	**0.3**	**-**

Table 2: GDP by Expenditure Components (at constant 2010 prices)
Source: Bank Negara

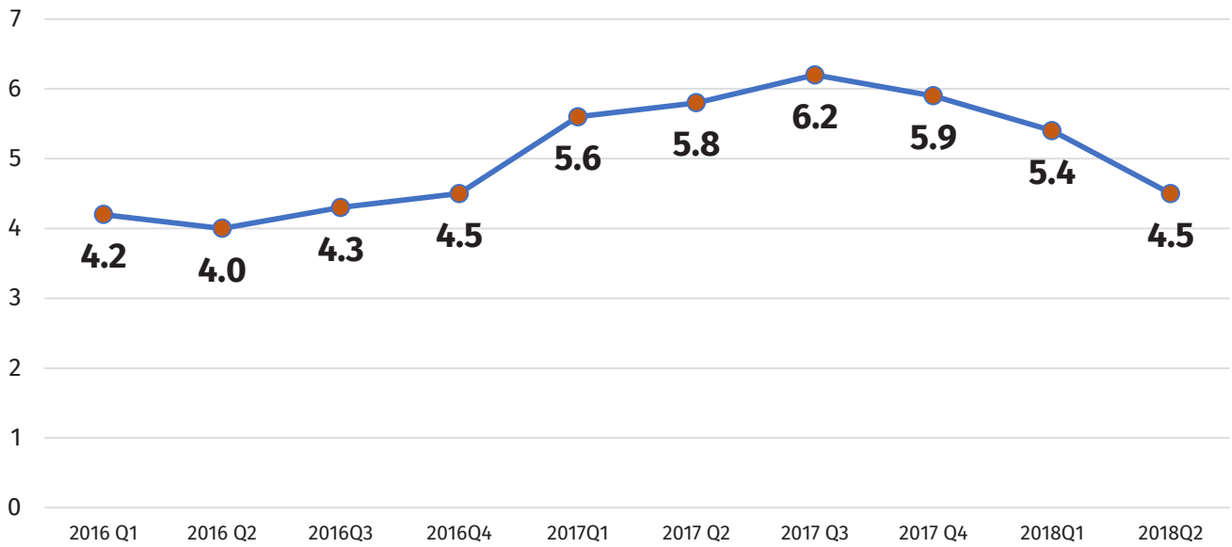

Chart 4: GDP Growth Rate Quarter by Quarter (2016-Q2 2018)
Source: DOSM and Bank Negara

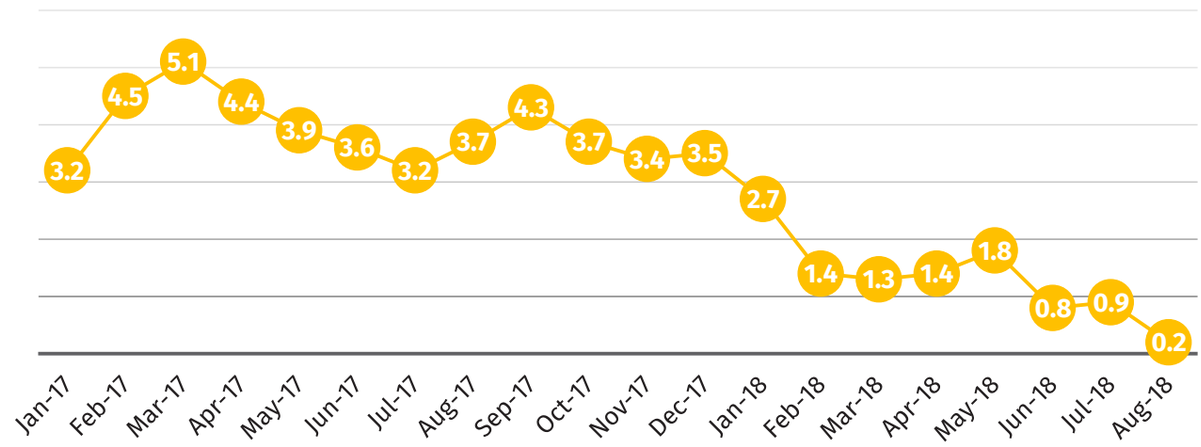

Chart 5: Y-O-Y Inflation Rate from January 2017 to August 2018
Source: DOSM and Bank Negara

This year's second quarter GDP growth was lower than the first quarter growth of 5.4%. In the first half of 2018, GDP growth was 4.9% compared with a high 5.7% in the same period of 2017 **(Chart 4 and Table 2)**.

Inflation Rate

The three-month tax holiday from June 1 to August 31 following the zero-rating of the GST as well as the stabilising of RON95 fuel prices (It was previously subject to weekly market prevailing prices) boosted consumer spending and confidence. The inflation rate moved below 1.0% from June onwards **(Chart 5)** at levels not seen in recent times. Malaysia's inflation rate was at its lowest in February 2015 at 0.1% and highest in March 2017 at 4.9%. This year's lowest inflation rate was recorded in August when it was at 0.2%. But the SST implemented on September 1 is expected to have a reverse effect on inflation and likely to result in a moderately higher rate. The fuel subsidies are still in effect, which gives a slight breather to consumers.

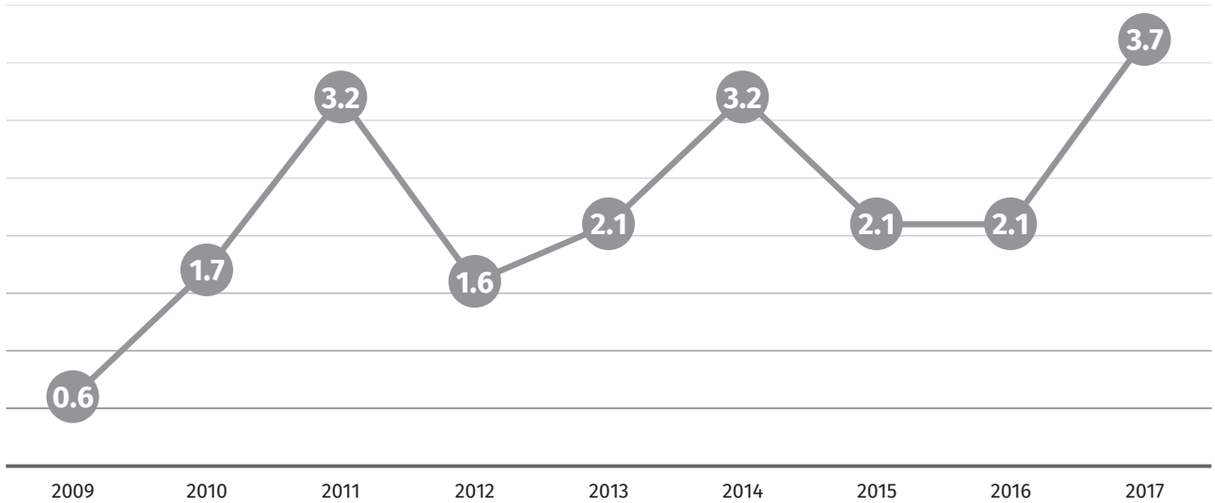

Chart 6: Inflation Rate in Malaysia from 2009-2017
Source: DOSM and Bank Negara

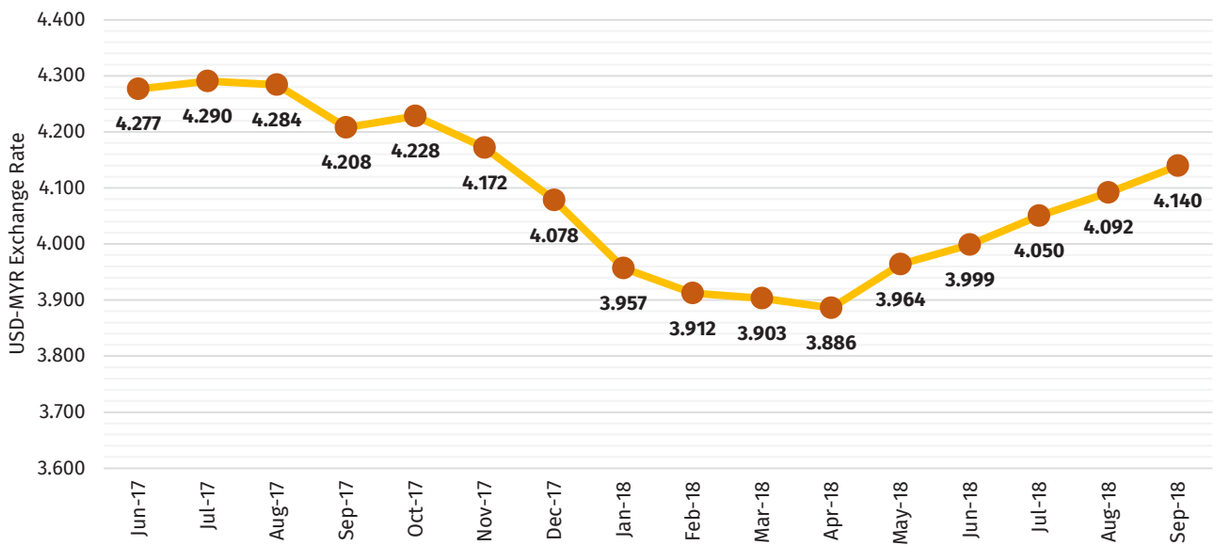

Chart 7: USD-MYR Exchange Rate from June 2017 to September 2018
Source: Bank Negara

Exchange Rate

Investors weighed the developments and changes following the outcome of GE14 and formation of the new Government. Despite the weakening of the Ringgit against the US Dollar since this year, the Ringgit is still one of Asia's best performing currencies and the most undervalued according to Bank Negara. Budget 2019 reported that the Ringgit appreciated against the Indian Rupee by 12.3%, Indonesian Rupiah by 8.1%, Filipino Peso by 3.0%, Chinese Renminbi by 3.2% and Singapore Dollar by 0.6%. Like other emerging markets, Malaysia was also subjected to the outflow of funds following the strengthening of the US Dollar.

Malaysia's exports grew at 6.9% between January and June this year, contributing to a current account surplus of RM18.9 billion or 2.8% of GDP. A strong current account surplus can potentially support the strength of the Ringgit in the long run.

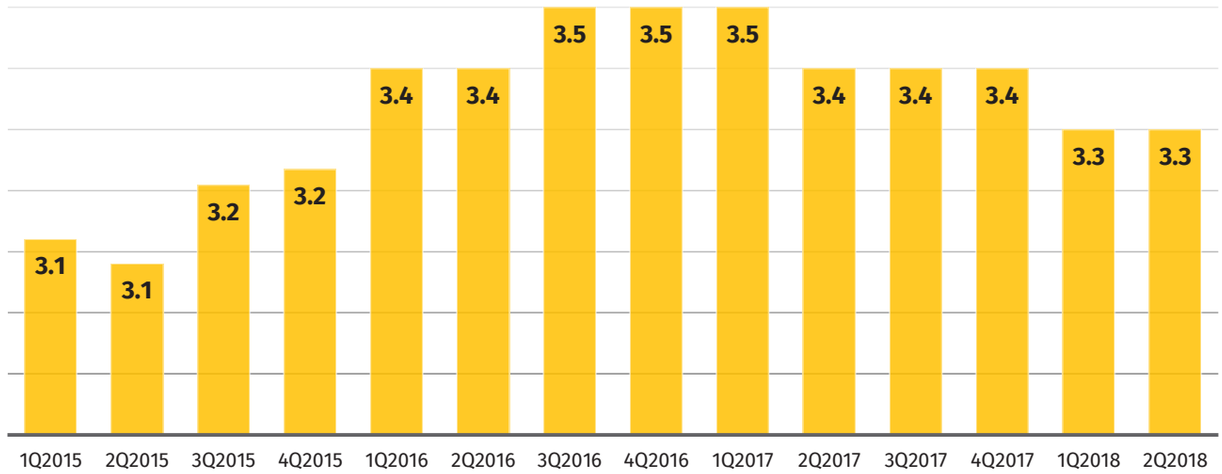

Chart 8: Unemployment Rate in Malaysia from 2015 to 2018 (Quarter by Quarter)
Source: DOSM

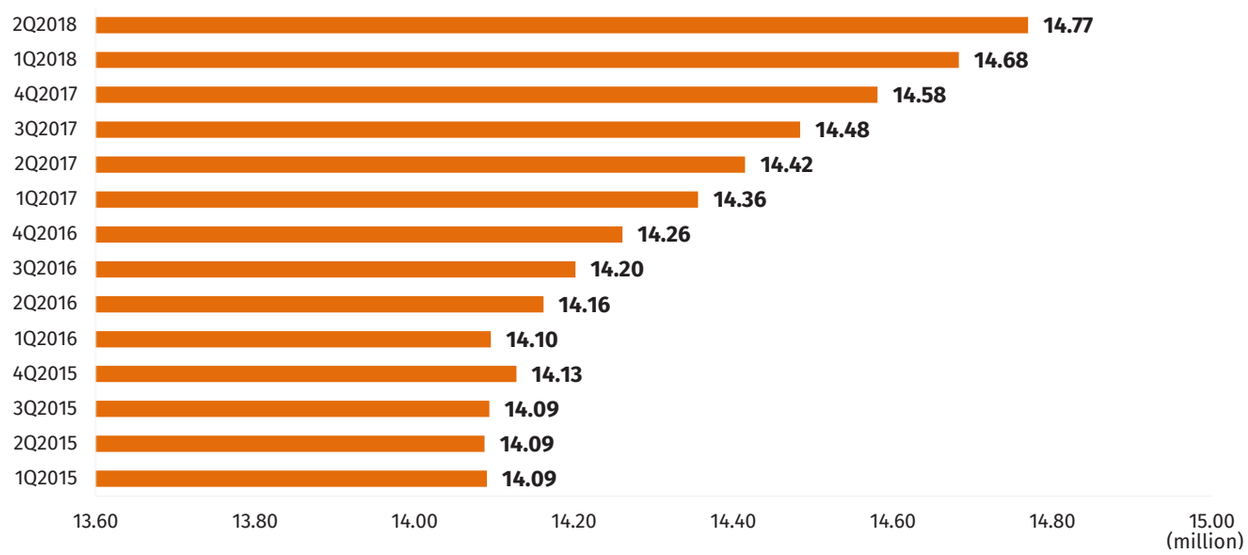

Chart 9: Employment Figures in Malaysia from 2015 to 2018 (Quarter by Quarter)
Source: DOSM

Labour Market

The unemployment rate in Malaysia remained stable at 3.3% in the first and second quarters of this year, after registering 3.4% from the second to the fourth quarter of 2017. The Finance Ministry stated that wages in the private sector grew by 6.2% in the first half of 2018.

The employment rate grew by 2.4%, which resulted in the employment of 14.8 million persons in the second quarter of 2018 **(Chart 9)**. According to the Department of Statistics Malaysia (DOSM), the rise of employment was contributed by those who worked fewer than 30 hours a week.

The labour market is expected to improve further with total employed persons in 2019 to reach 15.1 million, with the bulk going to the Services sector at 9.3 million workers from 9 million in 2017.

KEY LOCAL AND GLOBAL INFLUECING FACTORS

Scrapping of Infrastructure Projects

In efforts to curb the country's debt by saving billions of Ringgit, the Government has reviewed and decided on the status of several high-profile projects as follows:

- Cancelled the RM15 billion Multi-Product Pipeline and Trans-Sabah Pipeline projects;
- Suspended the construction of the RM81 billion East Coast Rail Link (ECRL), pending renegotiation of the cost of the project;
- Cancelled the RM60 billion MRT3 project for now, pending the completion of MRT2;
- Postponed the implementation of the Kuala Lumpur-Singapore High-Speed Rail, which costs at least RM110 billion;
- Reduced the overall cost of the 37km LRT3 project by Prasarana Malaysia Bhd from RM31.6 billion to RM16.6 billion, a savings of 47.0% or RM15 billion;
- Reduced the construction cost of the MRT2 project managed by MRT Corp by RM8.8 billion from RM39.3 billion to RM30.5 billion, representing a savings of 22.4%;
- Terminated the RM5.2 billion Klang Valley Double-Tracking 2 project;

Fiscal Deficit

The fiscal deficit is expected to expand to 3.7% of GDP in 2018, from the earlier target of 2.8% set by the previous government. According to the Finance Ministry, the increase is due to previously unbudgeted items such as the RM1 billion interest servicing cost for 1MDB debts, RM1.3 billion in compensation for the acquisition of Eastern Dispersal Link in Johor, RM1 billion for Prasarana, RM1.4 billion for Ministry of Transport rail projects and paying back GST refunds.

The government is targeting to narrow this deficit to 3.4% of GDP in 2019, 3.0% in 2020 and 2.8% in 2021.

US-China Trade War

The trade dispute between the US and China is even more intense than when it first surfaced in the first quarter of this year. The US has reportedly imposed tariffs on US$250 billion worth of Chinese goods including steel and aluminium. China has retaliated, imposing duties on US$110 billion worth of goods including coal, medical equipment and chemicals.

The rising prospect of a full-blown trade war between the two countries has resulted in capital outflows from emerging markets like Malaysia back into the US. The Economic Outlook 2019 report by the Ministry of Finance stated that countries with twin deficits (current account deficit and fiscal deficit) will be hit the hardest.

Oil Prices

Oil prices have jumped more than 160% since early 2016, when it was below US$30 per barrel. The recovery of oil prices will bring back revenue to Malaysia, which is a nett oil exporter. However, the trade dispute between the US and China, demand for fuel, and concerns over rising supply by oil-producing countries could have an impact on the price but it remains to be seen how big the effect would be.

Global Economic Growth

The ongoing US-China trade war could also weaken the global economy. In view of this, the International Monetary Fund (IMF) has already cut its global growth forecast to 3.7% for 2018 from 3.9% and is expected to stay at this level in 2019.

The IMF has also revised down the growth forecast for Europe and Britain. IMF has reduced its forecast for global trade growth from 4.8% to 4.2% for 2018 and 4.0% for 2019.

BUDGET 2019: HIGHLIGHTS FOR THE ICT INDUSTRY

Finance Minister Lim Guan Eng surprised many with a higher allocation of RM314.5 billion as compared to an estimated RM290.4 billion in 2018. From the total, RM259.8 billion is for Operating Expenditure while RM54.7 billion is provided for Development Expenditure.

We have listed the measures and allocations related to the development of the ICT Industry.

1. **Allocation of more than RM5 billion for the adoption of Industry 4.0**

   The Industry 4.0 blueprint, titled 'Industry4WRD' aims to make Malaysia the prime destination for high-tech industries. The Government will initiate the following measures to support Industry4WRD:

   - Allocate RM210 million from 2019 to 2021 to support the transition and migration to Industry 4.0. The government will assist the first 500 SMEs to carry out Readiness Assessment to migrate to Industry 4.0 platforms via the Malaysia Productivity Corporation;
   - The government will provide RM2 million to Knowledge Resource for Science and Technology Excellence (KRSTE.my) to enable greater collaboration between the public and private sectors based on existing resources. Next year, the government will make available RM250 million for the private sector to access and share;
   - To incentivise SMEs to invest in automation and modernisation which forms part of Industry 4.0, the government has allocated RM2 billion under the Business Loan Guarantee Scheme (SJPP) with government guarantees of up to 70%;
   - The government will create a RM3 billion Industry Digitalisation Transformation Fund with a subsidised interest rate of 2% under Bank Pembangunan Malaysia Berhad. The purpose of this fund is to accelerate the adoption of smart technology towards driving automation, robotics and artificial intelligence in the industry;
   - The Malaysian Investment Development Authority will continue to provide matching grants through its High Impact Fund (HIF) with a specific emphasis on Industry 4.0 initiatives. This includes activities such as R&D, initiatives to obtain international certification and standards, modernising and upgrading of facilities and tools and licensing or purchase of new or high technology;

PIKOM looks forward to this allocation for the years 2019-2021 to encourage the adoption of Industry 4.0 in the manufacturing sector.

2. **An allocation of RM1 billion for the National Fibre Connectivity Plan**

   - The plan will develop the country's broadband infrastructure to ensure more efficient spectrum allocation to achieve the targeted 30 Mbps speeds at rural and remote areas within five years. This is part of the overall plan to achieve world class infrastructure at affordable prices;
   - The government has also enforced the Mandatory Standards for Access Pricing (MSAP) which will result in fixed broadband prices being reduced by at least 25% by the end of 2018;

   PIKOM applauds the government's proposed plan to offer 30Mbps broadband connectivity outside urban centres within five years under the National Fiber and Connectivity Plan to digitalise Malaysia's economy. This will have a catalytic effect on the ICT industry, especially on the growth of the e-commerce sub-sector in Malaysia.

3. **An allocation of RM50 million for the Co-investment Fund for Equity Crowd Funding and Peer-to-Peer (P2P)**

   - As part of its effort to support new technology developments and to ensure sufficient funding for entrepreneurs, the government proposed to allocate RM50 million to set up a Co-Investment Fund (CIF). The Fund will invest alongside private investors via new alternative financing platforms such as Equity Crowdfunding and Peer-to-Peer Financing.

   PIKOM gives a thumbs-up as this allocation will help start-ups at the seed and Series A funding-levels, resulting in the creation of more local Intellectual Property (IP).

4. **Allocation of RM10 million for e-Sports**

   The government has allocated RM10 million to the Malaysia Digital Economy Corporation (MDEC) to develop e-Sports, recognising that this is an activity and industry which is increasingly popular among the younger generation.

PIKOM welcomes the news as the association recognises the growing importance of e-Sports.

PIKOM has formed a new Special Interest Group on e-Sports to drive and grow the e-gaming community.

5. **Customs Department to scrutinise online services**

   Imported services will be subjected to a Service Tax so as to ensure that local service providers for architecture, graphic design, IT and engineering design services are not unfairly disadvantaged against foreign competitors. This new tax is expected to be introduced on 1 January, 2019.

   We urge the government to implement this measure in consultation with the respective industries.

6. **Exemption of SST on services for B2B**

   To further improve the efficiency and effectiveness of the SST, starting 1 January 2019, the government will grant exemptions for specific B2B services to registered Service Tax entities.

   The association understands that this exemption is to address the cascading effects of the SST on services in specific sectors, but it will require more details. This will certainly lower the cost of doing business.

7. **Reduction of corporate tax by 1%**

   The corporate income tax rate for taxable income up to RM500,000 and SMEs with less than RM2.5 million in paid up capital will be reduced from 18% to 17%.

   Any reduction in corporate taxes is a welcome move as it will increase business spending which will have a ripple effect on the economy.

Although cautiously optimistic that the above will spur the growth of the digital economy, PIKOM is concerned over the following:

- Lack of incentives for the corporate sector (beyond manufacturing) in ICT and venture capital for start-up investment and productivity. This includes tax rebates and exemptions;
- No incentives for personal relief to drive consumer spending. For example, personal tax reduction and special schemes to allow individual purchases of ICT equipment e.g. the Employees Provident Fund (EPF) withdrawal scheme.

PIKOM'S PERSPECTIVE: MALAYSIA'S ECONOMIC FORECAST

With its diversified economy, low unemployment rate, current account surplus, strong domestic demand and resilient equity market, the Malaysian economy is looking strong. That said, the country is still vulnerable to external and internal challenges before it gets back on track to achieve real progressive growth.

We expect the GDP for the third quarter (July to September) to be 4.7%, higher than the reported 4.5% GDP in Q2 2018. The association took into account two out of the three months of tax holiday during the third quarter. In this quarter, consumers took advantage of several sales in conjunction with the festive Hari Raya season as well as the Merdeka and Malaysia Day holidays.

The fuel subsidies for RON95 and diesel were maintained by the new government, which cushioned the impact of the SST to a certain degree.

However, PIKOM is taking a relatively conservative approach towards the projection of GDP in the fourth quarter. We forecast the Q4 2018 GDP growth to be between 3.8% and 4.0%, taking into account the effects of the SST in the last three months of the year, the depreciation of the Ringgit which will put pressure on the inflation rate as well as imported goods, the slowdown in the global economy, and the escalating US-China trade war, which in the long run would affect Malaysia.

In light of these uncertainties, PIKOM is revising down its earlier GDP forecast for 2018 from 4.8% to 4.6%, based on a lower Q4 2018 GDP forecast.

"Growth among the large Asean countries is expected to remain solid in 2018 and beyond. Malaysia would be the one exception to this pattern, with slower growth expected in 2018 as well as into 2019 and 2020," said Sudhir Shetty, chief economist of the East Asia and Pacific Region of the World Bank, in a regional conference video call here today. (The edgemarkets.com 4 October 2018).

PIKOM concurs with this view that Malaysia will continue with a more subdued growth as compared with economies in the region. PIKOM forecasts GDP growth rates of between 4.0% to 4.5% for 2019 and 2020. By then, the Government will have been governing for more than two years with policies that may bear fruit and provide a strong foundation for further development.

Suffice to say, everyone will be watching earnestly the 1MDB scandal being played out in the courts and the attempts to recover the allegedly misappropriated funds.

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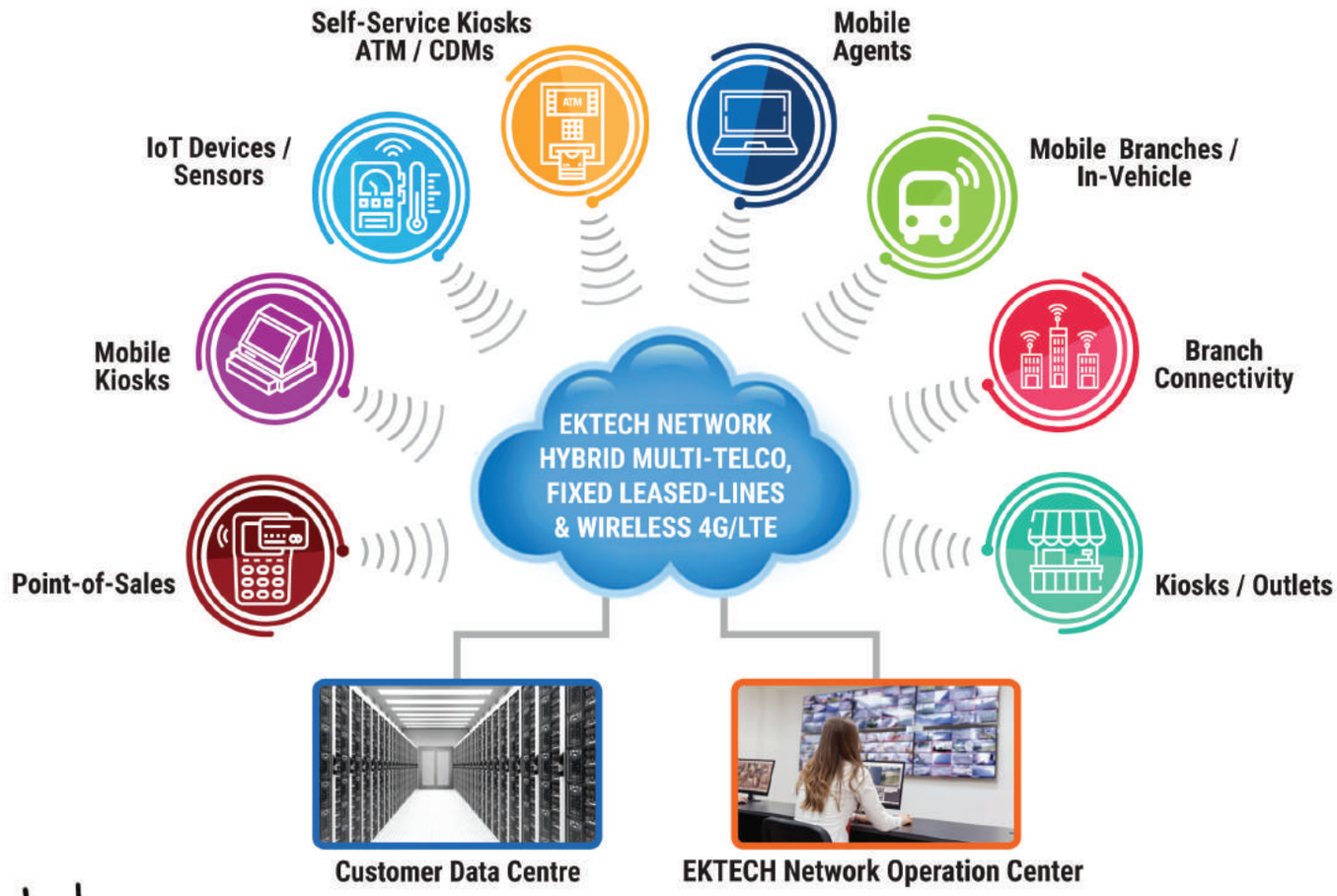

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CHAPTER 2:

ICT Industry Outlook 2018/19:
A new leadership, a renewed focus, an anticipated leap

PIKOM

The ICT industry in 2017 contributed RM247.1 billion to the economy, equivalent to 18.3% of Malaysia's Gross Domestic Product (GDP). This amount comprises RM178.2 billion (13.2%) from the ICT-GDP and RM68.9 billion (5.1%) from e-commerce of the non-ICT industries. Over a seven-year period, the industry has increased its contribution from 16.5% in 2010 to 18.3% in 2017 at an Annual Average Growth Rate (AAGR) of 9.0%.

However, the 2017 quantum of 18.3% was an increase of only 0.1% points from 2016. PIKOM projects the ICT-GDP in 2018 to reach an estimated RM192 billion excluding the contribution from e-commerce of the non-ICT industries. With the ICT industry extending and expanding the size of the digitised ecosystem, PIKOM is confident that the domestic ICT industry will generate positive growth in the medium to longer term especially with the continuing emergence of Big Data, Analytics, Artificial Intelligence and Robotics being drivers of the 4th Industrial Revolution.

However, like any other industry, it will be subject to global and regional challenges. Two major considerations impacting the industry are exchange rate fluctuations and the US-China trade war, which can potentially affect our exports.

As in previous years, the ICT data lags by about 10 months behind the reporting year. The 2017 data was made available at the end of October. Earlier availability of such data will help businesses in their planning, including implementing contingencies before the end of the financial year.

Another significant event this year was the historic 14th General Election (GE14) on May 9, resulting in a new government and building anticipation of exciting changes. The domestic ICT Industry welcomes any changes that will boost and strengthen the industry further.

Shortly after the formation of the new government, a new Communications and Multimedia Minister was appointed. Gobind Singh Deo, in his new role as the Minister, expressed the need to make internet access a constitutional right for all Malaysians. Some states and rural areas are still lagging behind in digital connectivity compared to the more progressive parts of the country.

Towards this objective, the Communications and Multimedia Ministry made a call to all telecommunication service providers to double the speed of internet access, but at reduced rates. Enabling the whole country with a population of 32.4 million to enjoy more affordable broadband access will have a significant effect on efforts to create a digitalised Malaysia.

Malaysia's ICT industry will benefit greatly from this move, which is expected to create job opportunities, enhance business and make the ICT industry more dynamic. (Refer to *Recent ICT Developments in Malaysia*).

Growth of the ICT Industry

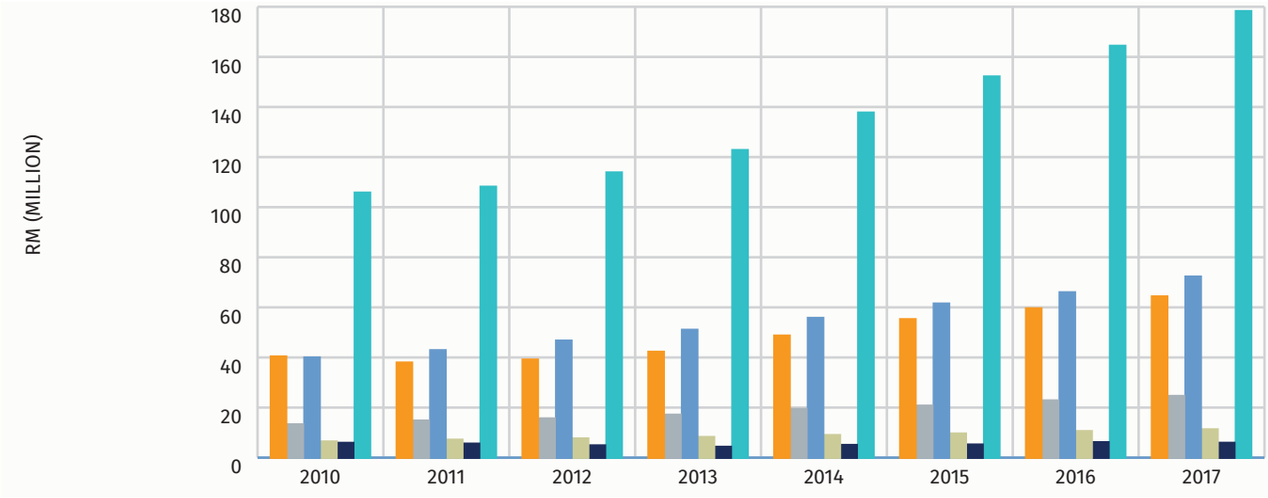
The country's ICT industry has made remarkable progress and quadrupled in value since 2007.

In estimating the contribution of the ICT industry to the economy, the Department of Statistics Malaysia (DOSM) reports the total value of the ICT-GDP and e-commerce of non-ICT industries. This has been used as a benchmark in measuring the performance of the industry.

The ICT-GDP has been on an upward trajectory since 2010 when it registered RM105.7 billion in GDP contribution. Based on the AAGR of 7.8% from 2010 to 2017, PIKOM projects the ICT-GDP in 2018 to reach an estimated RM192 billion.

Year	Contribution of ICT to the Economy (RM billion)	Share of the ICT Industry to the Economy (%)	ICT-GDP (RM million)	Share of ICT to the GDP (%)	e-Commerce of non-ICT industries (RM million)	Share of e-commerce of non-ICT industries to GDP (%)	GDP at current prices (RM billion)	Share of e-commerce to GDP (%)	e-commerce gross value added (RM million)
2010	135.3	16.5	105,745	12.9	29,576	3.6	821	4.6	37,729
2011	144.5	15.9	108,103	11.9	36,407	4.0	912	4.9	44,605
2012	154.6	15.9	113,799	11.7	40,787	4.2	971	5.1	49,760
2013	167.4	16.4	122,734	12.0	44,641	4.4	1,019	5.4	55,261
2014	188	17	137,252	12.4	50,723	4.6	1,106	5.8	63,636
2015	205.9	17.8	151,861	13.1	54,077	4.7	1,159	5.9	68,290
2016	223.9	18.2	164,359	13.4	59,578	4.8	1,231	6.1	75,039
2017	247.1	18.3	178,217	13.2	68,858	5.1	1,353	6.3	85,775

Table 1: Snapshot of ICT Industry in Malaysia from 2010-2017
Source: Department of Statistics Malaysia



	2010	2011	2012	2013	2014	2015	2016	2017
ICT manufacturing	40,335	37,899	39,092	42,210	48,662	55,211	59,546	64,308
ICT trade	13,236	14,741	15,606	17,083	19,341	20,702	22,790	24,574
ICT services	39,938	42,832	46,662	50,989	55,739	61,458	65,958	72,227
Content and media	6,389	7,099	7,604	8,181	8,951	9,575	10,529	11,241
Other industries	5,847	5,532	4,835	4,271	5,004	5,175	6,114	5,867
ICT-GDP	105,745	108,103	113,799	122,734	137,698	152,120	164,937	178,217

Chart 1: Breakdown of the ICT-GDP by Industries in Malaysia from 2010-2017 (RM Million)
Source: Department of Statistics Malaysia

Breakdown of the ICT-GDP by Industries (2010-2017)

The RM178.2 billion ICT-GDP was an increase of 8.4% over RM164.4 billion in 2016. ICT Services was the biggest ICT-producing sub-sector at RM72.2 billion, followed by ICT Manufacturing at RM64.3 billion. ICT Trade and Content and Media contributed RM24.6 billion and RM11.2 billion respectively **(Chart 1)**. In percentage share of the contribution, ICT Services was 40.5%, followed by ICT Manufacturing at 36.1% and ICT Trade at 13.8%.

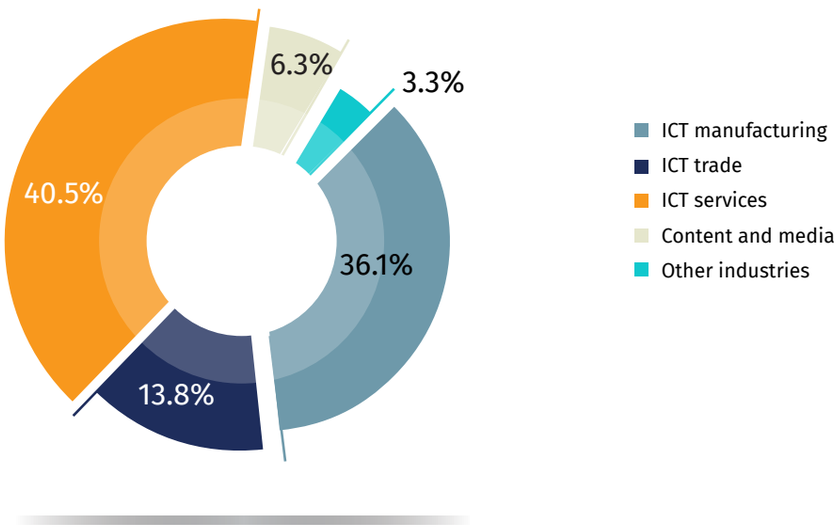


Chart 2: Share by ICT-producing Industries in Malaysia in 2017
Source: Department of Statistics Malaysia

If we look at the components in each ICT-producing industry, we see several interesting growth trends **(Table 2)**.

Electronic components & boards, communication equipment and consumer electronics, retail trade, telecommunications as well as motion picture, video and television programme, photographic and creative activities were the main growth drivers of the ICT industry in 2017.

Telecommunications, retail trade, motion picture, video and television programme registered strong growth trends from 2010-2017 with the highest AAGR of all sub-components at 10.2%, 10.1% and 9.5% respectively.

E-Commerce Growth

The e-commerce gross value added grew by 14.3% to RM85.8 billion in 2017 from RM75.0 billion in 2016 **(Chart 3)**, with e-commerce of non-ICT industries the main contributor at RM68.9 billion.

This sector has more than doubled from RM37.7 billion in 2010. PIKOM expects e-commerce to continue on an aggressive growth track to record RM96.5 billion in 2018 based on an AAGR of 12.5% from 2010-2017.

E-commerce of non-ICT industries reached RM68.9 billion in 2017, recording a healthy 15.6% growth from RM59.6 billion in previous year. This growth is almost double that of ICT-GDP which rose by 8.4% in 2017.

The share of e-commerce of non-ICT industries to the GDP has grown steadily during this seven-year period from 3.6% in 2010 to 5.1% in 2017. It is expected to reach RM77.8 billion in 2018 based on an AAGR of 12.9%.

Employment in the ICT Industry

The number of employees in the ICT industry grew marginally at almost 2% from 1.07 million in 2016 to 1.09 million in 2017. ICT workers are those working in the four ICT-producing industries: ICT Services; ICT Manufacturing; ICT Trade; and Content and Media.

DOSM reported that ICT Manufacturing was the biggest employer with 411,000 representing more than a third of the total ICT workforce. This was followed by ICT Services with 301,000, ICT Trade with 224,000 and Content and Media with 155,000 **(Chart 5 and Chart 6)**.

ICT-Producting Industries	2010	2011	2012	2013	2014	2015	2016	2017	Y-O-Y growth	AAGR (2010-2017)	2018 projection
ICT manufacturing	**40,335**	**37,899**	**39,092**	**42,210**	**48,591**	**55,048**	**59,481**	**64,308**	**8.1%**	**7.1%**	**68,870**
Computers and peripheral equipment	6,211	4,422	4,237	4,419	4,513	4,519	4,703	4,355	-7.4%	-4.3%	4,170
Electronic components & boards, communication equipment and consumer electronics	34,124	33,478	34,855	37,791	44,078	50,530	54,778	59,953	9.4%	8.5%	65,073
ICT trade	**13,236**	**14,741**	**15,606**	**17,083**	**19,355**	**20,711**	**22,811**	**24,574**	**7.7%**	**9.3%**	**26,851**
Wholesale trade	4,924	5,696	5,900	6,380	7,085	7,084	8,073	8,343	3.3%	8.0%	9,008
Retail trade	8,312	9,045	9,706	10,702	12,269	13,627	14,738	16,230	10.1%	10.1%	17,862
ICT services	**39,938**	**42,832**	**46,662**	**50,989**	**54,909**	**60,746**	**65,967**	**72,227**	**9.5%**	**8.8%**	**78,610**
Telecommunications	26,231	28,782	31,817	35,072	38,759	42,849	47,112	51,662	9.7%	10.2%	56,915
Computer programming, consultancy, information and related activities	9,826	9,944	10,476	11,218	12,363	13,616	14,531	15,591	7.3%	6.9%	16,660
Other ICT services	3,881	4,106	4,369	4,699	3,787	4,281	4,324	4,974	15.0%	4.2%	5,183
Content and media	**6,389**	**7,099**	**7,604**	**8,181**	**9,146**	**9,732**	**10,448**	**11,241**	**7.6%**	**8.4%**	**12,188**
Publishing of books, periodicals and other publishing activities	2,823	3,109	3,168	3,232	3,783	4,126	4,424	4,696	6.1%	7.6%	5,055
Motion picture, video, television programme, photographic and creative activities	1,288	1,370	1,514	1,830	1,997	2,020	2,201	2,403	9.2%	9.5%	2,630
Other content and media	2,279	2,619	2,922	3,119	3,366	3,586	3,823	4,142	8.3%	8.9%	4,513
Other industries*	**5,847**	**5,532**	**4,835**	**4,271**	**5,251**	**5,625**	**5,651**	**5,867**	**3.8%**	**0.7%**	**5,906**
ICT-GDP	**105,745**	**108,103**	**113,799**	**122,734**	**137,252**	**151,861**	**164,359**	**178,217**	**8.4%**	**7.8%**	**192,088**

Table 2: ICT-GDP (Breakdown by Industry) (RM Million)
Source: Department of Statistics Malaysia

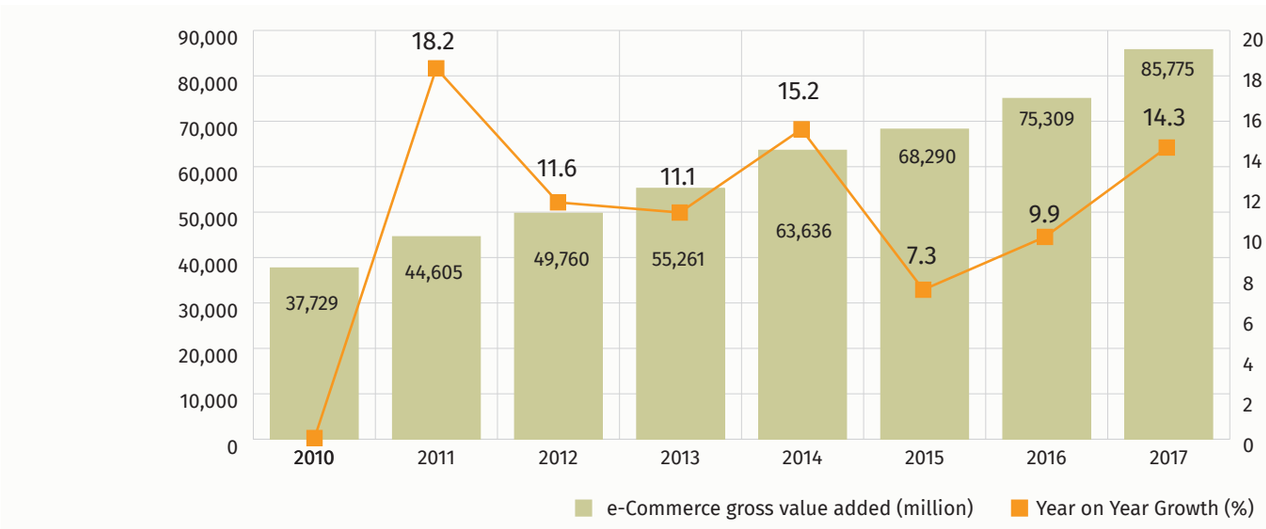


Chart 3: E-Commerce Gross Value Added from 2010-2017 (RM Million)
Source: Department of Statistics Malaysia

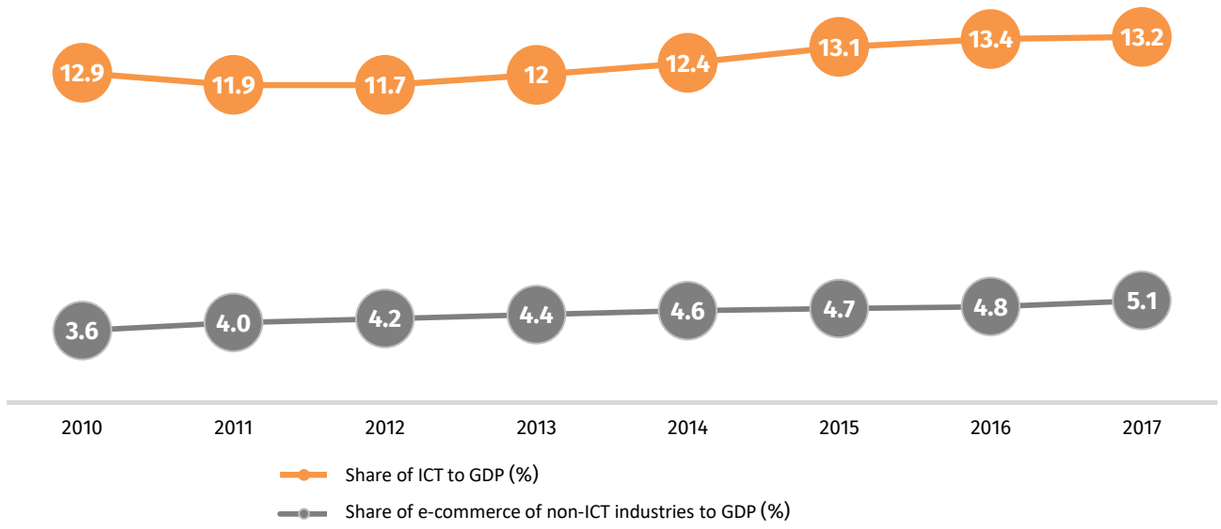


Chart 4: E-Commerce of non-ICT industries and ICT-GDP Growth Rate (%) in Malaysia from 2010-2017
Source: Department of Statistics Malaysia

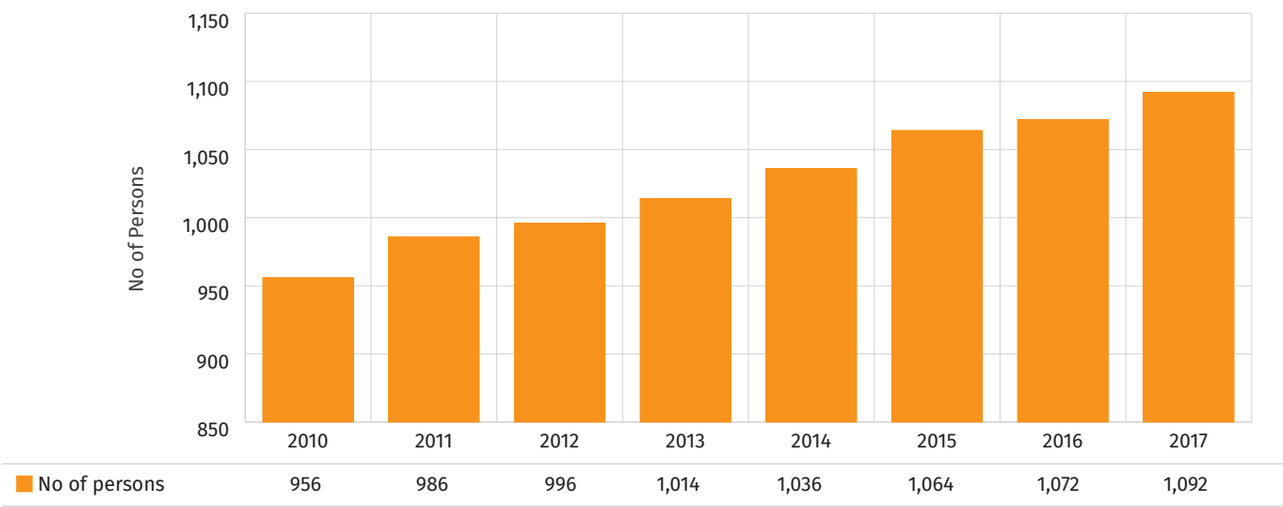
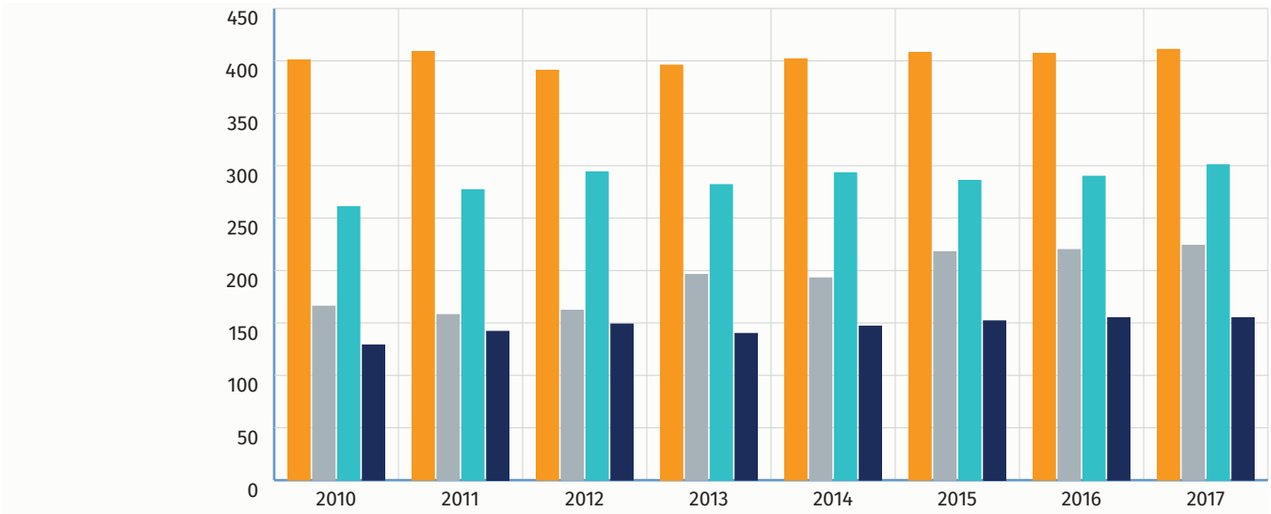


Chart 5: Number of Persons Employed in ICT Industry from 2010-2017 ('000)
Source: Department of Statistics Malaysia

Recent ICT Developments in Malaysia

- *Mandatory Standard for Access Pricing (MSAP)*
  On June 8 2018, the implementation of the MSAP came into full effect, which enabled fixed broadband services to be reduced in price by at least 25% by Dec 31 with higher speeds also made available. In October, the Malaysian Communications and Multimedia Commission (MCMC) announced four new starter packages under RM100 by Telekom Malaysia, Maxis, TIME.com and Celcom. Besides dropping prices, the telcos have also offered higher speeds for existing plans at the same price, with some even offering 10 times more speed.

- *New Commission for start-ups*
  The Communications and Multimedia Ministry in September proposed the setting up of a Commission for Start-up and Venture Capital to streamline current efforts made by stakeholders to develop Malaysia's flourishing start-ups and the venture capital industry. Through this commission, Malaysia will be able to develop



	2010	2011	2012	2013	2014	2015	2016	2017
ICT manufacturing	401	409	391	396	402	408	407	411
ICT trade	166	158	162	196	193	218	220	224
ICT services	261	277	294	282	293	286	290	301
Content and media	129	142	149	140	147	152	155	155

Chart 6: Breakdown of Employment in the ICT Industry in Malaysia from 2010-2017 ('000)
Source: Department of Statistics Malaysia

young and future talents in new technologies like artificial intelligence and robotics.

- *4th Industrial Revolution: Waking Up the Manufacturing Sector*
  On October 31 2018, Prime Minister Tun Dr Mahathir Mohamad launched Industry4WRD, which is the National Policy on Industry 4.0, a strategic approach to boost the participation of Malaysia's small and medium enterprises (SMEs) in the manufacturing sector via higher productivity, contribution, innovation and more high-skilled workers.

The objectives of this policy are as follows:

1. To increase the level of productivity in the manufacturing industry per person by 30% from RM106,647 to RM138,641;

2. To elevate the absolute contribution of the manufacturing sector to the economy from the current RM254 billion to RM392 billion.

3. To improve Malaysia's position in the Global Innovation Index from 35th to be among the top 30.

4. To achieve a higher percentage of high-skilled workers in the manufacturing sector from 18% to 35%.

- *SST and Depreciation of Ringgit*
  PIKOM has called on the government to exempt ICT products from the Sales and Services Tax (SST) prior to its implementation on September 1 2018.

  Before the previous Goods and Services Tax (GST) came into effect on April 1 2015, the majority of ICT products were exempted from the SST, which included personal computers, printers, peripherals, projectors and related multimedia products.

  The SST for cameras and smartphones was reduced from 10% to 5% after the tax was reintroduced two months back. At the start of 2018, the Ringgit had strengthened, reaching below RM4.00 against the US dollar. It was at its lowest at RM3.86 in March this year, but has since gradually depreciated to RM4.18 at the end of October.

  After a three-month tax holiday following the zero-rating of the GST on June 1, the

reintroduction of the SST and the fall of the ringgit to the dollar have dealt a double blow to consumer spending for ICT devices and services. This could affect the industry, including retail and service provision. This is a development that will be closely watched by industry players.

Conclusion

The new government is putting in place policies, measures and plans to address the ICT needs of the nation. For instance, with the MSAP paving the way for more affordable high-speed internet services, an increasing number of SMEs will be able to join the burgeoning e-commerce ecosystem and market their products beyond borders.

With a vibrant e-commerce market in place, more consumers would be attracted to shop online, contributing further to e-commerce revenue. As it is, the e-commerce sector is already recording annual double-digit growth and has more than doubled since 2010. The outlook for this sector is looking very bright.

The breakthrough Industry4WRD is a timely new policy to empower SMEs in the manufacturer sector to adopt Industry 4.0 and boost their productivity. It is also an important move as the SME segment needs to be the backbone of the economy. The government has set a goal to increase SME contribution to the country's GDP from 37.1% to 41.0% by 2020 and plans to increase the export share of SMEs from 17.3% in 2017 to 23.0% in 2020.

Brain drain continues to be an issue in the country, impacted further by the depreciation of the Ringgit, resulting in young Malaysians leaving the country for greener pastures. One bright spark in ICT human resource and education is the attractive nature of cybersecurity jobs. Recently, Communications and Multimedia Minister Gobind Singh Deo pointed out that Malaysia is one of the top three ASEAN countries expected to contribute 75% to the cybersecurity market share by 2025.

The digital economy has provided tremendous job opportunities in the cybersecurity market and as such, it is important to nurture talent in this area of interest. The government said Malaysia is not producing enough talented cybersecurity professionals fast enough to meet the demand. Quoting a recent Frost & Sullivan digital talent study, the Minister said the demand for cybersecurity talents in Malaysia would hit 10,500 by 2020.

In previous reports, PIKOM had estimated that the contribution of the ICT industry to the economy would be about 20% by 2020. This was based on a comparatively better economic performance in 2017, the setting up of the Digital Free Trade Zone to boost SME participation in e-commerce and the progress of Malaysia moving forward in its digital agenda.

However, with the latest DOSM figures showing a mere 0.1 percentage points increase to 18.3% for 2017 coupled with the uncertain economic outlook this year, we expect spending by government, businesses and consumers to be affected. If we relook at the snapshot of the ICT industry from 2010 till 2017 **(Table 2)**, it can also be seen that the computers and peripheral equipment businesses under ICT Manufacturing (the second largest contributing sub-sector after ICT Services) is showing a declining growth during the period.

PIKOM expects the e-commerce sector to contribute strongly to the industry as more consumers are moving towards online shopping. However, in line with a revised target for the country to reach high-income status by 2024 and also in view of recent developments, PIKOM is less than optimistic that the ICT industry can reach the aspired 20% contribution to GDP by 2020. Perhaps at best, a contribution of 19% is achievable by 2020, assuming that the ICT Services and e-commerce sub-sectors continue to grow faster.

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CHAPTER 3:

ICT Job Market in Malaysia 2018 / 2019

PIKOM

For the first time in the *PIKOM ICT Strategic Review* report, an extension of the salary outlook for 2018 and forecast for 2019 is produced in this edition. This is based on real data available from January to September 2018, giving readers a more accurate view of the market and enabling a more effective forecast for 2019. In addition, an earlier reporting of the 2018 salary landscape (with actual data) will also provide employers with a reliable benchmark to decide end-of-year bonuses and increments for 2019.

This extract of the salary outlook also gives PIKOM an opportunity to gauge if the forecast for 2018 in the earlier part of the year was accurate in view of changes changes in the economic and political landscape in Malaysia. Based on the analysis of the earlier forecast and the current data, there was indeed a difference between the 2018 forecast (projection based on 2017 data) and the average salaries of the nine months this year.

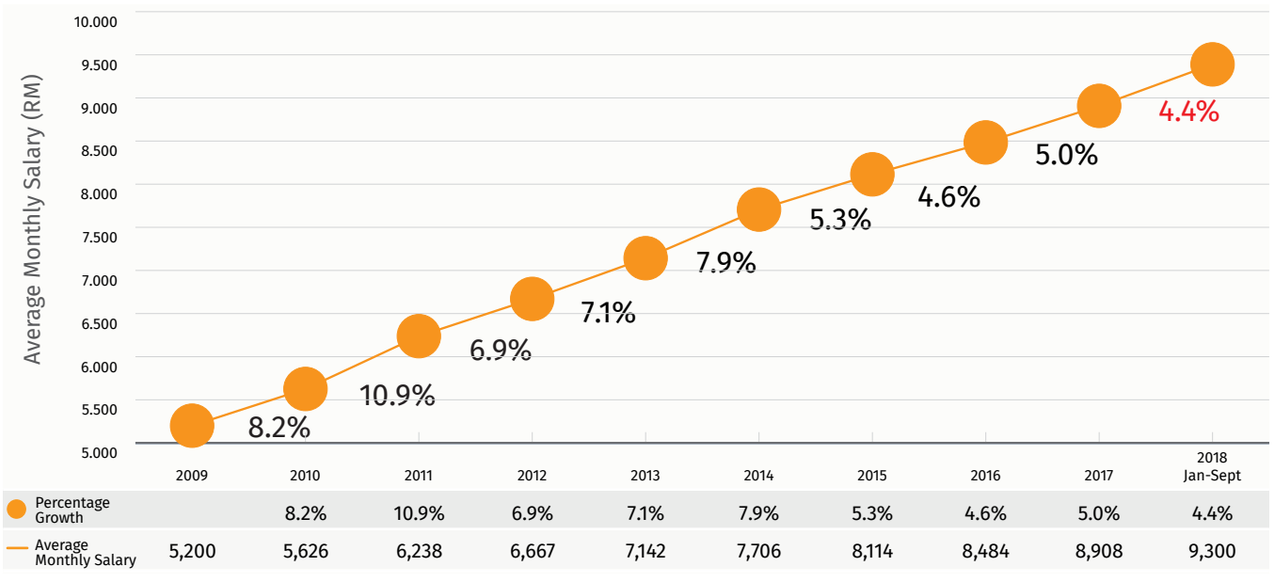
Average salaries for this nine-month period in 2018 recorded an overall growth of 4.4% from 2017 as compared with the earlier forecast of 5.4%. Were the changes in the local and global environments the cause of this? PIKOM is of the opinion that the uncertainties caused by the change in government post GE14, the ongoing US-China trade war and budget constraints are among the factors that contributed to the slower salary growth than initially anticipated.

In this extract version, we again focus our analysis on five position levels, namely: entry level; junior executive; senior executive; manager; and senior manager in 22 industries. Such data were again sourced from JobStreet.com for the period between January and September this year.

As in the full ICT salary report, this version also analyses the salary growth for each level, the top paying industries, top hiring industries and number of jobs in each position level, as advertised in the first nine months of the year.

2018 Salary Growth Rate

For the first three quarters of 2018, the average monthly salary of ICT professionals registered an overall growth of 4.4%, as compared with 5.0% in 2017. **Chart 1** shows this to be the lowest growth in 10 years.



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 Jan-Sept
Percentage Growth		8.2%	10.9%	6.9%	7.1%	7.9%	5.3%	4.6%	5.0%	4.4%
Average Monthly Salary	5,200	5,626	6,238	6,667	7,142	7,706	8,114	8,484	8,908	9,300

Chart 1: Overall Average Monthly Salary of ICT Professionals in Malaysia (2009-2018*)

*Jan-Sept 2018

Job Category	Entry Level		Junior Executive		Senior Executive		Manager		Senior Manager		Overall	
YEAR	RM	Y-O-Y	RM	Y-O-Y	RM	Y-OY	RM	Y-O-Y	RM	Y-O-Y	RM	Y-O-Y
2009	1,971		2,800		4,332		6,163		10,368		5,200	
2010	2,181	10.7%	2,936	4.9%	4,514	4.2%	7,005	13.7%	10,795	4.1%	5,626	8.2%
2011	2,238	2.6%	3,151	7.3%	5,039	11.6%	7,837	11.9%	12,166	12.7%	6,238	10.9%
2012	2,324	3.8%	3,205	1.7%	5,344	6.1%	8,434	7.6%	13,674	12.4%	6,667	6.9%
2013	2,438	4.9%	3,439	7.3%	5,744	7.5%	8,986	6.5%	14,661	7.2%	7,142	7.1%
2014	2,581	5.9%	3,719	8.1%	6,157	7.2%	9,591	6.7%	16,057	9.5%	7,706	7.9%
2015	2,718	5.3%	3,894	4.7%	6,483	5.3%	10,195	6.3%	17,053	6.2%	8,114	5.3%
2016	2,817	3.7%	4,052	4.1%	6,727	3.8%	10,646	4.4%	18,132	6.3%	8,484	4.6%
2017	2,958	5.0%	4,259	5.1%	7,057	4.9%	11,168	4.9%	19,147	5.6%	8,908	5.0%
2018*	3,079	4.1%	4,442	4.3%	7,374	4.5%	11,670	4.5%	20,105	5.0%	9,300	4.4%
AAGR (2009-2017)	**5.2%**		**5.4%**		**6.3%**		**7.8%**		**8.0%**		**7.0%**	

Table 1: Average Monthly Salary of ICT Professionals by Job Category (2009-2018*) *Jan-Sept 2018
Source: Jobstreet.com and PIKOM Estimates

Entry Level: *Less than 1 year experience;* **Junior Executive:** *1-4 years experience;* **Senior Executive:** *3-7 years experience;* **Manager:** *6-10 years experience;* **Senior Manager:** *> 10 years experience*

In the *PIKOM ICT Job Market Outlook in Malaysia 2018* report (released in June), PIKOM had projected that the overall average monthly salary would be in the range of 4.5% to 5.4%, but we leaned towards the higher end of this range. This was based on a higher Average Annual Growth Rate (AAGR) of the average monthly salary (2010-2017) of 7.0% **(Table 1)**. We were confident that ICT skills, especially specialised skills, were still in high demand and that employers were willing to invest in competitive salaries.

The earlier report was based on 4,248 full-time job positions in 22 industries which were advertised in the first three months of 2018 as compared to the nine months of salary data points in this report.

Table 1 shows that all five job categories experienced a slower growth rate in the average monthly salary of ICT professionals in 2018. However, even with a downwards revision to the 2018 salary growth from the earlier 5.4% to 4.4%, PIKOM is confident that the industry is still healthy as evidenced from Jobstreet.com data showing that there were over 16,381 job openings in the first nine months of this year. This figure surpasses the whole of 2017 figure of 15,197 jobs. This clearly suggests that while salaries in 2018 will not grow as much as previous years, ICT professionals at all position levels are still in demand.

The salary figures are based on job advertisements for ICT professionals in the 22 industries as follows:

- Agriculture / Plantation / Aquaculture
- Automotive / Heavy Industry / Machinery
- Banking
- Call Centre / IT-Enabled Services / BPO
- Computer / IT (Hardware)
- Computer / IT (Software)
- Construction / Building / Engineering
- Consulting (Business / Technical)
- Education
- Electrical & Electronics
- Financial Services / Securities / Insurance
- Hotel / Restaurant / Food Service / Hospitality
- Manufacturing / Production
- Oil / Gas / Petroleum
- Printing / Publishing
- Property / Real Estate
- Science & Technology / Aerospace / Bio Technology
- Semiconductor / Wafer Fabrication
- Telecommunication
- Transport / Storage / Freight /Shipping
- Utilities
- Wholesale / Retail / Trading

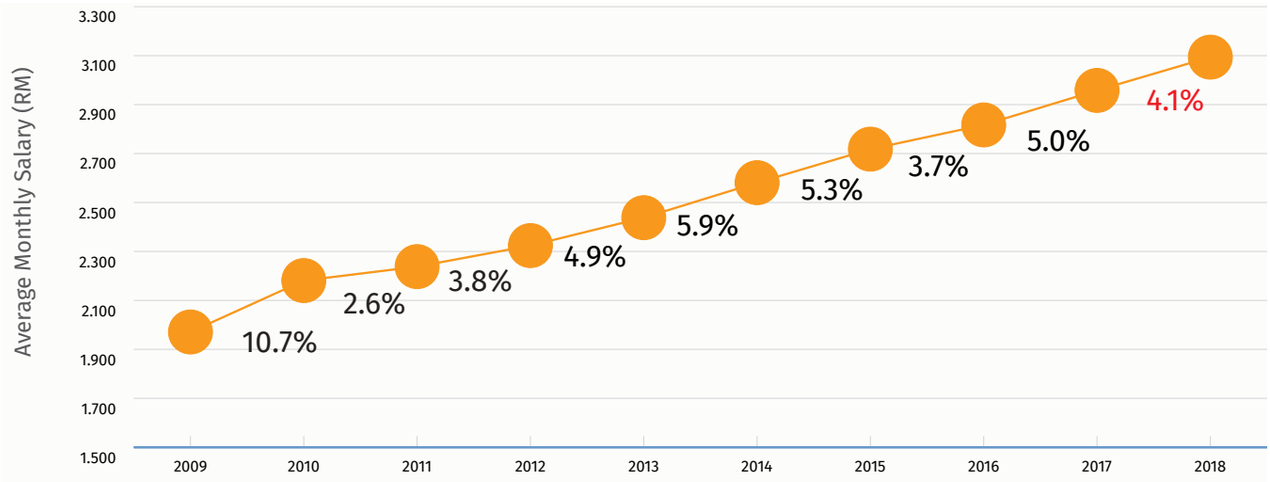
Salary Trends by Job Category

Position Level	Industry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 (Jan-Sept)
Entry Level	Automotive/Heavy Industry/Machinery	1,406	1,731	2,175	2,175	2,763	3,063	3,387	3,615	3,955	4,271
Entry Level	Electrical & Electronics	1,508	1,769	2,063	2,343	2,343	2,931	3,110	3,279	3,552	3,806
Entry Level	Banking	1,805	2,000	2,225	2,425	2,425	2,875	3,008	3,130	3,335	3,525
Entry Level	Computer/ IT(Software)	2,125	2,244	2,400	2,450	2,553	2,763	2,861	2,934	3,059	3,174
Entry Level	Consulting (Business/Technical)	2,000	2,125	2,275	2,325	2,525	2,625	2,742	2,832	2,965	3,084
Entry Level	Call Center/IT-Enabled Services/ BPO	2,025	2,125	2,275	2,275	2,375	2,575	2,660	2,714	2,819	2,917
Entry Level	Manufacturing/ Production	2,384	2,434	2,508	2,508	2,558	2,655	2,698	2,724	2,776	2,824
Entry Level	Computer/ IT(Hardware)	2,072	2,155	2,213	2,368	2,385	2,485	2,541	2,607	2,697	2,774
Entry Level	Telecommunication	1,918	2,008	2,120	2,150	2,280	2,375	2,457	2,518	2,613	2,698
Entry Level	Hotel/Restaurant/ Food Service/ Hospitality	2,165	2,199	2,225	2,288	2,288	2,340	2,362	2,388	2,425	2,457
Entry Level	Wholesale/Retail/ Trading	1,635	1,725	1,800	1,925	2,000	2,075	2,145	2,218	2,315	2,398
Junior Executive	Agriculture/ Plantation/ Aquaculture	2947	2968	3372	3,683	3,900	4,025	4,268	4,485	4,741	4,973
Junior Executive	Consulting (Business/Technical)	2550	3025	3150	3,283	3,350	4,041	4,067	4,246	4,518	4,759
Junior Executive	Financial Services/ Securities/Insurance	2900	3262	3400	3,479	3,543	4,160	4,165	4,306	4,538	4,742
Junior Executive	Banking	2900	3262	3400	3,475	3,543	4,160	4,165	4,305	4,537	4,741
Junior Executive	Semiconductor/ Wafer Fabrication	3061	3160	3700	3,753	3,753	3,963	4,094	4,297	4,481	4,647
Junior Executive	Computer/ IT(Software)	2582	2750	3025	3,063	3,275	3,900	3,947	4,074	4,343	4,579
Junior Executive	Science&Technology/ Aerospace/ BioTechnology	2575	2585	2925	3,069	3,171	3,888	3,907	4,023	4,305	4,548
Junior Executive	Wholesale/Retail/ Trading	2375	2483	3300	3,425	3,425	3,513	3,764	4,086	4,324	4,546
Junior Executive	Telecommunication	2975	3025	3250	3,388	3,538	3,913	3,984	4,094	4,300	4,480
Junior Executive	Oil/Gas/Petroleum	3044	3500	3675	3,725	3,775	3,875	3,979	4,182	4,319	4,447
Junior Executive	Call Center/IT-Enabled Services/ BPO	2825	2925	3225	3,225	3,400	3,874	3,913	4,027	4,244	4,433
Junior Executive	Automotive/Heavy Industry/Machinery	3220	3075	3100	3,563	3,663	3,878	3,994	4,063	4,247	4,404
Junior Executive	Transport/Storage/ Freight/Shipping	2960	2964	3098	3,100	3,638	3,763	3,884	3,965	4,166	4,339

Position Level	Industry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 (Jan-Sept)
Junior Executive	Hotel/Restaurant/ Food Service/ Hospitality	2258	2525	2575	3,045	3,258	3,355	3,594	3,810	4,054	4,277
Junior Executive	Property/Real Estate	2425	2538	3905	3,215	3,225	3,425	3,500	3,810	3,975	4,125
Junior Executive	Electrical & Electronics	2865	2725	3113	3,228	3,229	3,513	3,582	3,675	3,831	3,966
Junior Executive	Education	2133	2175	2523	2,575	2,888	3,150	3,288	3,434	3,664	3,868
Junior Executive	Printing/Publishing	2500	2699	2790	2,950	3,215	3,215	3,375	3,521	3,678	3,822
Junior Executive	Manufacturing/ Production	2825	3025	3095	3,157	3,292	3,392	3,464	3,565	3,676	3,777
Junior Executive	Construction/ Building/Engineering	2736	2675	2900	2,950	3,152	3,352	3,424	3,494	3,644	3,773
Junior Executive	Computer/ IT(Hardware)	2720	2963	3002	3,100	3,213	3,350	3,421	3,529	3,649	3,758
Senior Executive	Agriculture/ Plantation/ Aquaculture	3,683	3,967	4,600	5,033	5,943	7,154	7,803	8,173	8,909	9,627
Senior Executive	Oil/Gas/Petroleum	6,100	6,209	7,500	7,500	7,575	8,000	8,291	8,744	9,128	9,486
Senior Executive	Science&Technology/ Aerospace/ BioTechnology	4,575	4,515	5,031	6,500	6,500	7,063	7,600	8,110	8,696	9,245
Senior Executive	Telecommunication	5,225	5,225	6,193	6,675	6,675	7,000	7,361	7,794	8,183	8,548
Senior Executive	Transport/Storage/ Freight/Shipping	5,009	5,229	5,400	5,610	6,320	6,730	6,943	7,183	7,559	7,903
Senior Executive	Property / Real Estate	4,339	4,339	5,300	5,825	6,050	6,250	6,483	7,017	7,452	7,833
Senior Executive	Financial Services/ Securities/Insurance	4,763	4,749	5,261	5,450	5,825	6,319	6,938	7,046	7,387	7,756
Senior Executive	Banking	4,763	4,749	5,395	5,575	5,825	6,319	6,840	7,009	7,344	7,695
Senior Executive	Hotel/Restaurant/ Food Service/ Hospitality	4,433	4,801	4,801	5,475	5,925	6,050	6,399	6,723	7,079	7,415
Senior Executive	Manufacturing/ Production	4,650	4,525	5,175	5,298	5,822	6,207	6,446	6,702	7,063	7,393
Senior Executive	Computer/ IT(Software)	4,475	4,505	4,769	5,160	5,400	5,999	6,612	6,672	7,004	7,367
Senior Executive	Electrical & Electronics	3,800	3,915	4,750	5,119	5,233	5,800	6,095	6,490	6,910	7,302
Senior Executive	Consulting (Business/Technical)	5,175	5,150	5,525	5,879	6,000	6,375	6,543	6,751	7,020	7,268
Senior Executive	Call Center/IT-Enabled Services/ BPO	3,832	4,428	4,556	4,750	5,054	6,125	6,160	6,423	6,850	7,237
Senior Executive	Semiconductor/ Wafer Fabrication	5,377	5,563	5,685	5,810	5,875	6,225	6,303	6,414	6,576	6,729
Senior Executive	Computer/ IT(Hardware)	4,315	4,577	4,769	4,835	5,110	5,410	6,038	6,056	6,269	6,532
Senior Executive	Utilities	4,550	4,550	4,710	5,201	5,201	5,350	5,525	5,699	5,888	6,063

Position Level	Industry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 (Jan-Sept)
Senior Executive	Construction/ Building/Engineering	3,922	4,250	4,500	4,575	4,700	5,322	5,364	5,553	5,813	6,050
Senior Executive	Automotive/Heavy Industry/Machinery	4,690	4,814	4,989	5,050	5,189	5,400	5,550	5,644	5,786	5,927
Senior Executive	Wholesale/Retail/ Trading	4,050	4,100	4,800	4,800	4,800	5,025	5,170	5,409	5,605	5,787
Senior Executive	Education	3,225	3,225	4,100	4,100	4,165	4,475	4,913	5,127	5,383	5,655
Senior Executive	Printing/Publishing	4,150	4,000	4,150	4,154	4,550	4,800	4,851	4,896	5,060	5,205
Manager	Electrical & Electronics	10,860	11,856	12,488	12,933	13,275	13,554	13,790	14,495	14,977	15,442
Manager	Wholesale/Retail/ Trading	5,486	6,870	9,737	9,948	9,958	10,422	11,279	12,661	13,527	14,422
Manager	Consulting (Business/Technical)	7,265	7,655	7,995	8,594	8,908	10,064	10,444	10,820	11,398	11,924
Manager	Call Center/IT-Enabled Services/ BPO	7,688	7,280	8,394	8,993	9,023	9,744	10,078	10,506	10,988	11,425
Manager	Construction/ Building/Engineering	5,355	6,372	6,565	6,574	8,475	8,807	9,376	9,994	10,696	11,354
Manager	Automotive/Heavy Industry/Machinery	8,494	8,903	8,995	9,166	9,578	10,133	10,267	10,510	10,832	11,122
Manager	Manufacturing / Production	6,675	7,264	8,286	8,342	8,701	9,009	9,384	9,944	10,380	10,808
Manager	Telecommunication	7,794	7,931	8,507	8,684	9,082	9,410	9,667	10,001	10,344	10,662
Manager	Financial Services/ Securities/Insurance	6,983	6,999	7,546	8,248	8,464	8,814	9,272	9,658	10,075	10,470
Manager	Computer/ IT(Hardware)	5,963	6,544	6,621	6,791	8,201	8,556	8,962	9,401	9,954	10,459
Manager	Banking	7,631	7,673	7,967	8,468	8,759	9,213	9,450	9,741	10,096	10,416
Manager	Computer/ IT(Software)	6,600	6,644	7,232	7,558	7,669	8,651	9,230	9,407	9,853	10,275
Manager	Education	4,200	4,913	5,162	5,999	6,712	7,579	8,335	8,858	9,560	10,231
Senior Manager	Call Center/IT-Enabled Services/ BPO	14,438	15,136	15,722	17,013	18,014	18,832	19,523	20,416	21,335	22,212
Senior Manager	Financial Services/ Securities/Insurance	9,490	10,203	10,250	13,961	13,961	14,700	15,950	17,167	18,323	19,450
Senior Manager	Banking	9,622	10,203	11,887	13,961	13,961	14,700	15,820	17,095	18,169	19,210
Senior Manager	Telecommunication	11,375	11,250	12,800	13,925	14,288	15,119	15,824	16,658	17,483	18,274
Senior Manager	Consulting (Business/Technical)	11,138	11,196	11,516	12,098	12,942	14,047	15,415	15,429	16,061	16,786
Senior Manager	Computer/ IT(Software)	8,703	9,250	10,000	10,375	11,094	12,439	12,979	13,493	14,226	14,948

Table 2: Salary Trends by Job Category (RM)



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Percentage Growth		10.7%	2.6%	3.8%	4.9%	5.9%	5.3%	3.7%	5.0%	4.1%
Average Monthly Salary	1,971	2,181	2,238	2,324	2,438	2,581	2,718	2,817	2,958	3,079

Chart 2: Overall Average Monthly Salary of Entry Level ICT Professionals (2009-2018*)
Source: Jobstreet.com and PIKOM Estimates

*Jan-Sept 2018

1. Entry Level

Entry Level ICT professionals or Fresh Graduates are those with less than one-year experience. Jobs were advertised in 11 out of the 22 industries tracked in this report for 2018. They were Automotive / Heavy Industry / Machinery, Banking, Call Centre / IT-Enabled Services / BPO, Computer / IT (Hardware), Computer/ IT (Software), Consulting (Business / Technical), Electrical & Electronics, Hotel / Restaurant / Food Service / Hospitality, Manufacturing/ Production, Telecommunication and Wholesale / Retail / Trading. (No data were found for the remaining 11 industries).

Based on the salary figures of the 1,332 jobs advertised in the first nine months of 2018, the average monthly salary for Entry Level professionals is RM3,079, representing a 4.1% growth, which is lower than the 5.0% growth recorded in 2017 **(Chart 2)**.

The top paying industries for Entry Level professionals in this period were Automotive/ Heavy Industry/ Machinery (RM4,271), Electrical & Electronics (RM3,806), Banking (RM3,525), Computer / IT (Software) (RM3,174) and Consulting (Business / Technical) (RM3,084) **(Table 2)**.

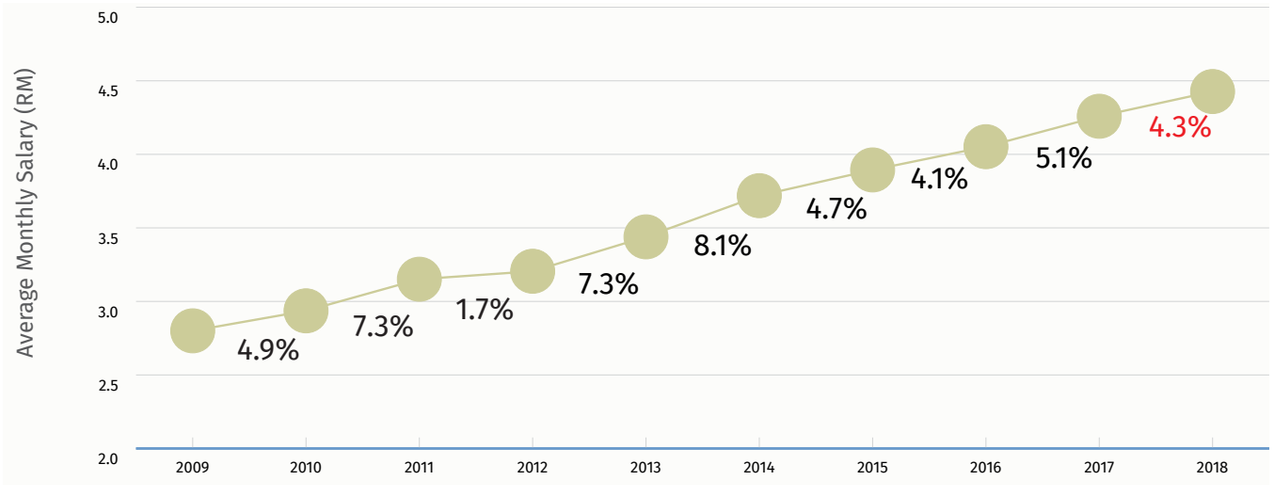
Although the 2018 growth in average monthly salary for this category shows a dip compared with the 5.0% growth rate in 2017, there was a higher number of jobs for entry level positions. The 1,332 jobs offered for Entry Level ICT professionals already surpasses the 1,236 total number of jobs for the whole of 2017.

2. Junior Executive

There were over 6,050 job openings for Junior Executive ICT professionals in 21 industries in the first nine months of this year. From these salary data points, the average monthly salary in this category was RM4,442, an increase of 4.3% from RM4,259 in 2017 **(Chart 3)**.

This again represents a slower growth compared with 5.1% in 2017. (Utilities was the only non-hiring industry for this category). As in the entry level, the number of job openings in the first three quarters of the year surpassed the 2017 figure by more than 700 jobs despite the fact that this category also recorded a lower growth in average monthly salary.

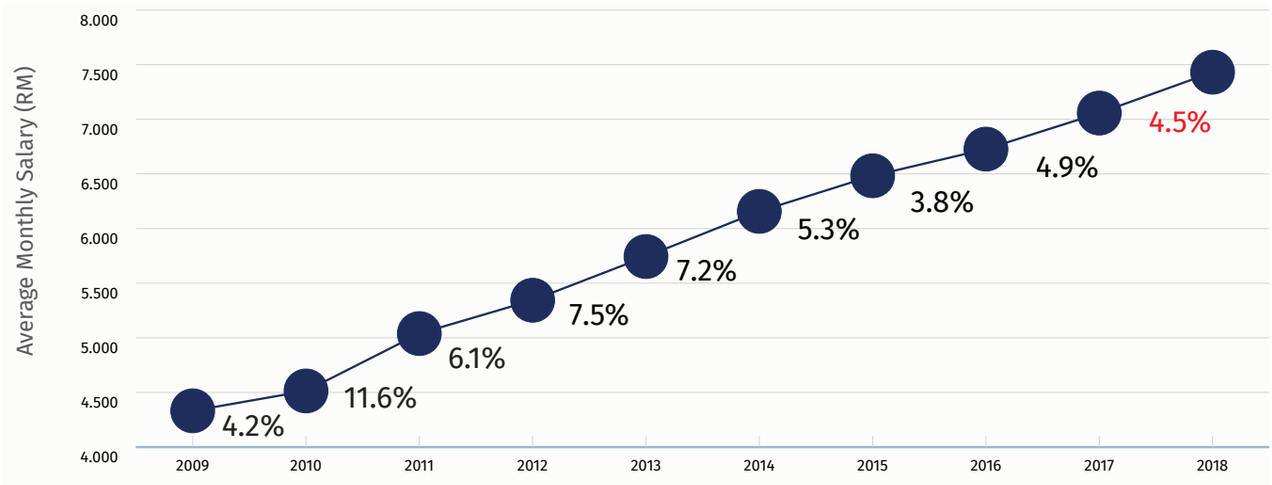
The overall top paying industries for this job category was Agriculture / Plantation / Aquaculture (RM4,973), Consulting (Business / Technical) (RM4,759) Financial Services / Securities / Insurance (4,742), Banking (RM4,741) and Semiconductor / Wafer Fabrication (RM4,647) **(Table 2)**.



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Percentage Growth		4.9%	7.3%	1.7%	7.3%	8.1%	4.7%	4.1%	5.1%	4.3%
Average Monthly Salary	2,800	2,936	3,151	3,205	3,439	3,719	3,894	4,052	4,259	4,442

Chart 3: Overall Average Monthly Salary of Junior Executive ICT Professionals (2009-2018*)
Source: Jobstreet.com and PIKOM Estimates

*Jan-Sept 2018



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Percentage Growth		4.2%	11.6%	6.1%	7.5%	7.2%	5.3%	3.8%	4.9%	4.5%
Average Monthly Salary	4,332	4,514	5,039	5,344	5,744	6,157	6,483	6,727	7,057	7,374

Chart 4: Overall Average Monthly Salary of Senior Executive ICT Professionals (2009-2018*)
Source: Jobstreet.com and PIKOM Estimates

*Jan-Sept 2018

3. Senior Executive

There were 7,047 job openings for Senior Executive ICT professionals in 22 industries in the first nine months of this year, the highest number in all the five categories **(Chart 8)**. The average monthly salary for this category was RM7,374, a growth of 4.5% from RM7,057 in 2017 **(Chart 4)**.

The top five paying industries for this category during this period were Agriculture / Plantation / Aquaculture (RM9,627), Oil / Gas / Petroleum (RM9,486), Science Technology / Aerospace / Biotechnology (RM9,245), Telecommunication (RM8,548) and Transport / Storage / Freight / Shipping (RM7,903).

4. Manager Level

ICT professionals in the Manager level category have a working experience of six to 10 years. In the first nine month of this year, there were

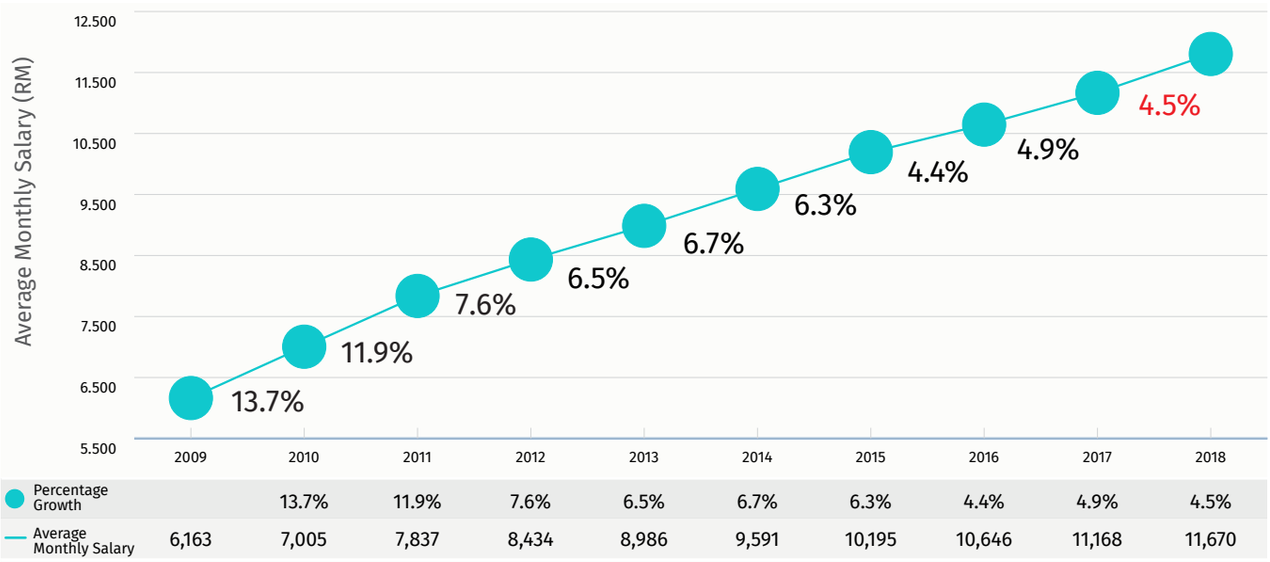


Chart 5: Overall Average Monthly Salary of Manager Level ICT Professionals (2009-2018*)
Source: Jobstreet.com and PIKOM Estimates

*Jan-Sept 2018

1,643 jobs advertised for this category, which is almost 400 more jobs advertised in 2017. The list of industries for this category for this year is the same 13 as in 2017, namely Automotive / Heavy Industry /Machinery, Banking, Call Centre / IT-Enabled Services / BPO, Computer / IT (Hardware), Computer / IT (Software), Construction / Building / Engineering, Consulting (Business / Technical), Education, Electrical & Electronics, Financial Services / Securities / Insurance, Manufacturing / Production, Telecommunication and Wholesale / Retail / Trading.

The average monthly salary growth for this category also slowed from 4.9% in 2017 to 4.5% in the first three quarters of the year **(Chart 5)**.

The top five paying industries for this category are Electrical & Electronics (RM15,442), Wholesale / Retail / Trading (RM14,422), Consulting (Business / Technical) (RM11,924), Call Centre / IT-Enabled Services / BPO (RM11,425) and Construction / Building / Engineering (RM11,354) **(Table 2)**.

5. Senior Manager

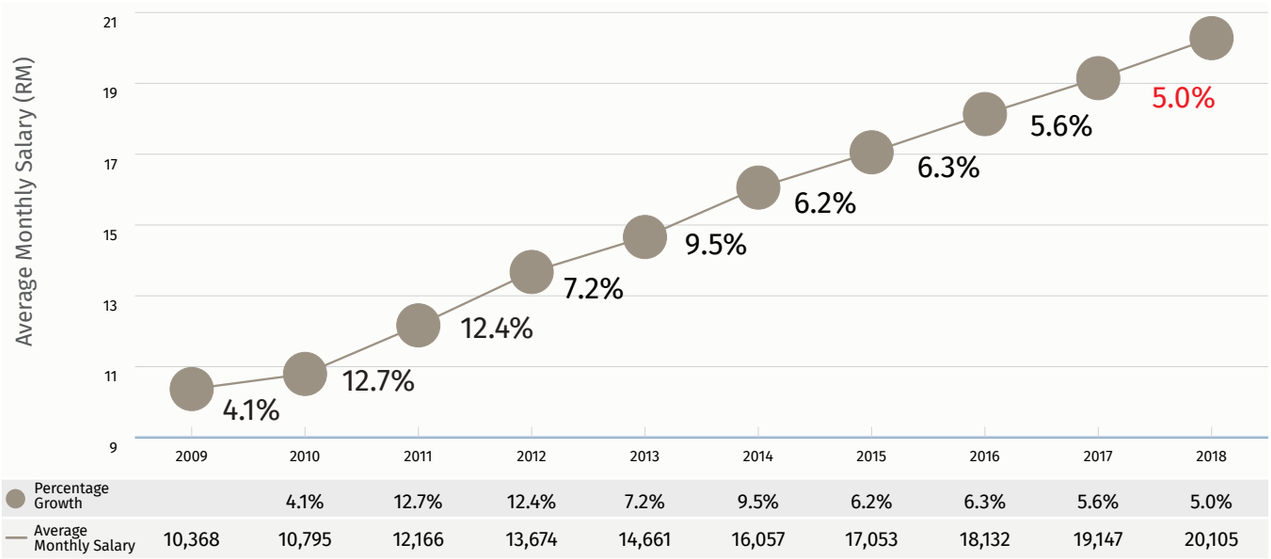
There were just six industries with job openings for Senior Manager ICT professionals in the first nine months this year, as compared with eight last year. The six, which were also in last year's list for this category, are Banking, Call Centre / IT-Enabled Services / BPO, Computer / IT (Software), Consulting (Business / Technical), Financial Services / Securities / Insurance and Telecommunications. The missing two were Computer / IT (Hardware) and Manufacturing / Production.

Although there were fewer industries this year, the number of job openings for this category was higher in the first nine months of the year at 302 compared with 215 for the whole of 2017. The average monthly salary of ICT professionals in this category was RM20,105, a growth of 5.0% from RM19,147 last year **(Chart 6)**.

The top paying industry for this category this year was Call Centre / IT-Enabled Services / BPO at an average monthly salary of RM22,212. Senior Manager ICT professionals recorded the highest average monthly salary growth among the five job categories for 2018.

Overall Top Five Paying Industries for ICT Professionals in 2018

Financial Services / Securities / Insurance and Call Centre / IT-Enabled Services / BPO were the overall top two paying industries for ICT professionals in Malaysia in the first nine months of 2018, recording RM10,604 and RM9,645 respectively **(Chart 7)**. These salary figures were higher than the overall average monthly salary of RM9,300 **(Chart 1)**. The



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Percentage Growth		4.1%	12.7%	12.4%	7.2%	9.5%	6.2%	6.3%	5.6%	5.0%
Average Monthly Salary	10,368	10,795	12,166	13,674	14,661	16,057	17,053	18,132	19,147	20,105

Chart 6: Overall Average Monthly Salary of Senior Manager ICT Professionals (2009-2018*)
Source: Jobstreet.com and PIKOM Estimates

*Jan-Sept 2018

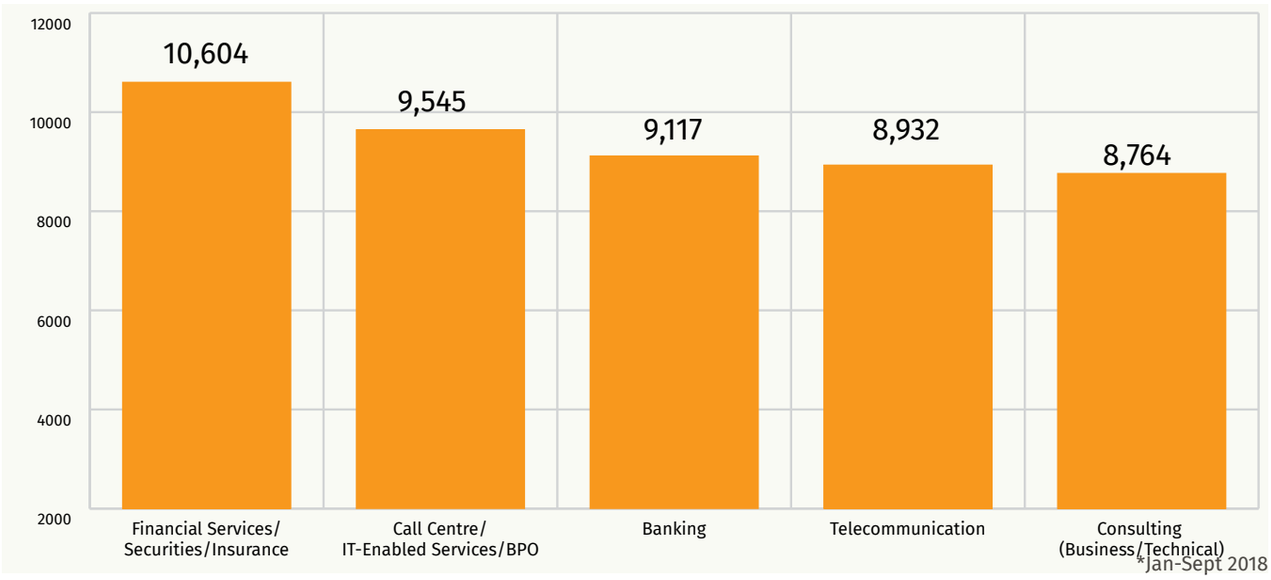


Chart 7: Overall: Top Paying Industries for ICT Professionals in Malaysia in 2018* (RM)
Source: Jobstreet.com and PIKOM Estimates

next three top paying industries were Banking at RM9,117, Telecommunication at RM8,932 and Consulting (Business / Technical) at RM8,764.

Hiring Trends of ICT Professionals in Malaysia

The number of job openings for ICT professionals in Malaysia for the first three quarters of this year was 16,381, which was much higher than 15,197 in 2017 **(Chart 8)**. This would indicate that the ICT job market climate is still robust and healthy in terms of demand for specialised skilled professionals in our country.

Chart 8 also shows that the Entry Level, Junior Executive, Manager and Senior Manager categories registered more job openings in the first nine months of 2018 than the whole of last year. Senior Executive was slightly lower at 7,047 during the same period compared with 7,118 **(Chart 9)** and the only one with job openings in all 22 industries.

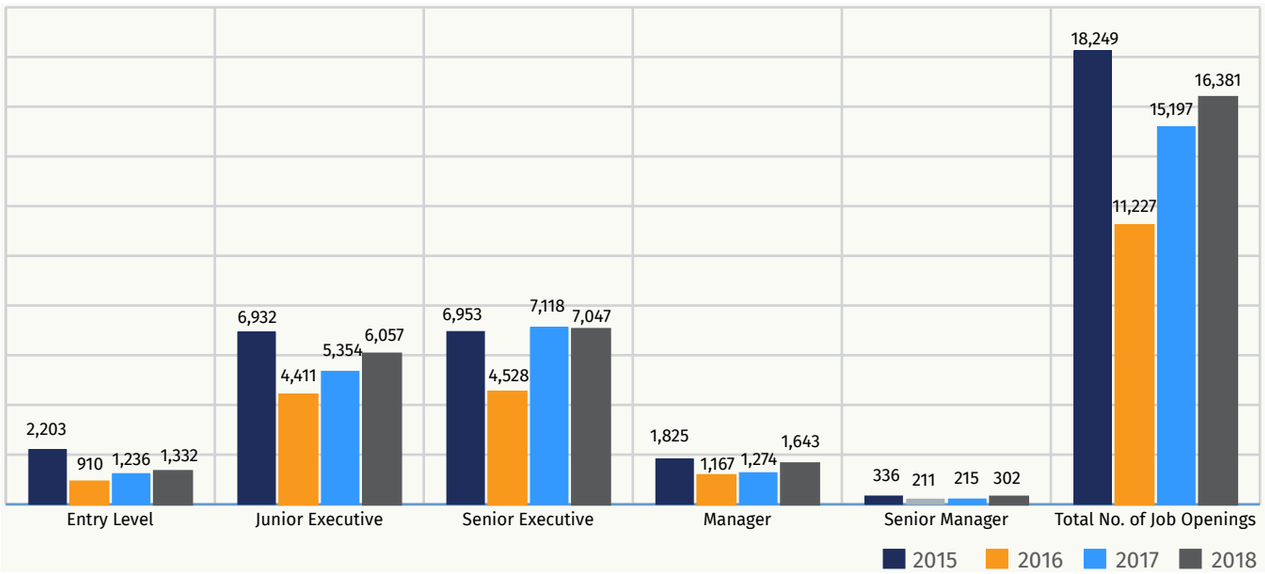


Chart 8: No. of job openings for ICT Professionals in Malaysia (2015-2018*)
Source: Jobstreet.com and PIKOM Estimates

*Jan-Sept 2018

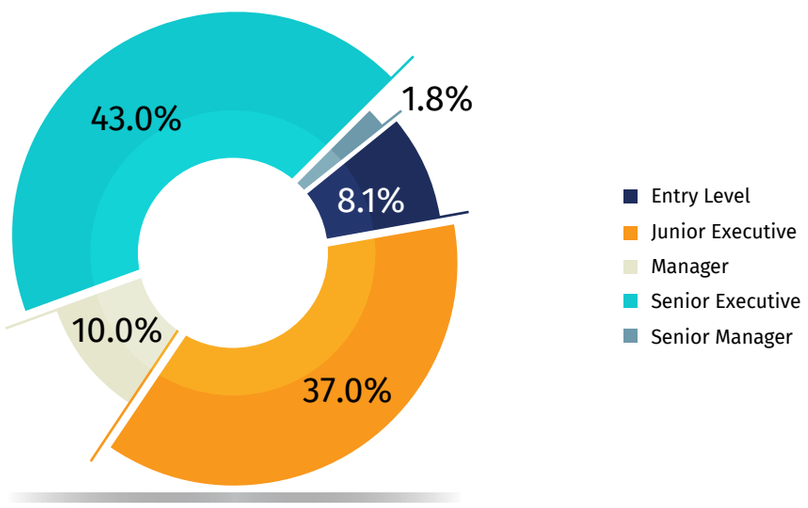


Chart 9: Hiring Trends for ICT Professionals in Malaysia by Position Level in 2018*
Source: Jobstreet.com and PIKOM Estimates

*Jan-Sept 2018

Junior Executives was the second highest in the number of job openings at 37.0%.

Top Hiring Industries for ICT Professionals in Malaysia for 2018*

The Computer / IT (Software) was the overall top hiring industry for ICT professionals for the first nine months of 2018 with 6,369 jobs **(Chart 10)**. This was followed by Consulting (Business / Technical) at 2,169 jobs and Manufacturing / Production at 1,398. Banking and Telecommunications rounded off the top five hiring industries with 994 jobs and 838 jobs respectively. These five industries alone offered 72% of the total number of jobs for the first nine months of this year.

Outlook For ICT Job Market in 2019

Given the slower salary growth of ICT professionals in 2018, PIKOM anticipates that this will be the trend for at least the next 12 months. With a

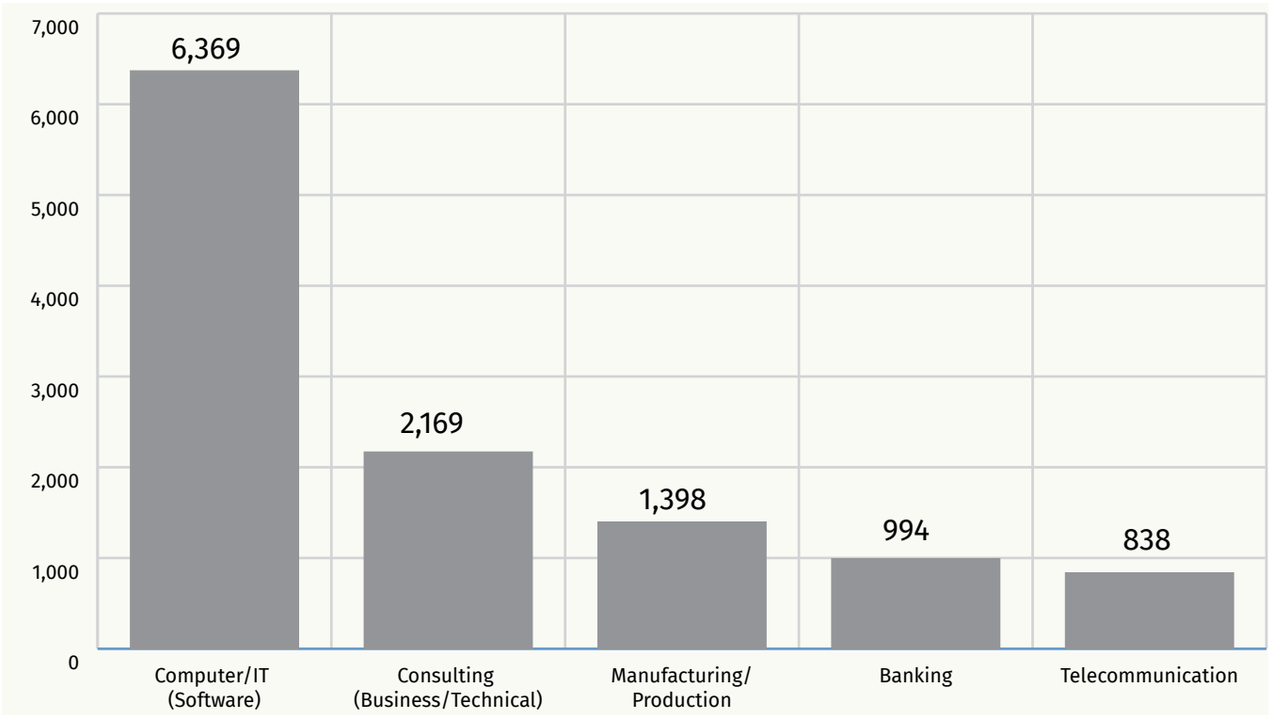


Chart 10: Top Five Hiring Industries for ICT Professionals in Malaysia in 2018*
Source: Jobstreet.com and PIKOM Estimates

*Jan-Sept 2018

growth rate of 4.4% in 2018 (nine months data), we expect the 2019 salary increase to be in the range of 4.0% to 4.6%, and that the number of jobs may increase for certain categories such as Senior Manager for industries that are heavily dependent on ICT including Banking, Financial Services, Telecommunications, Consulting and IT-Enabled Services (call centre and BPO).

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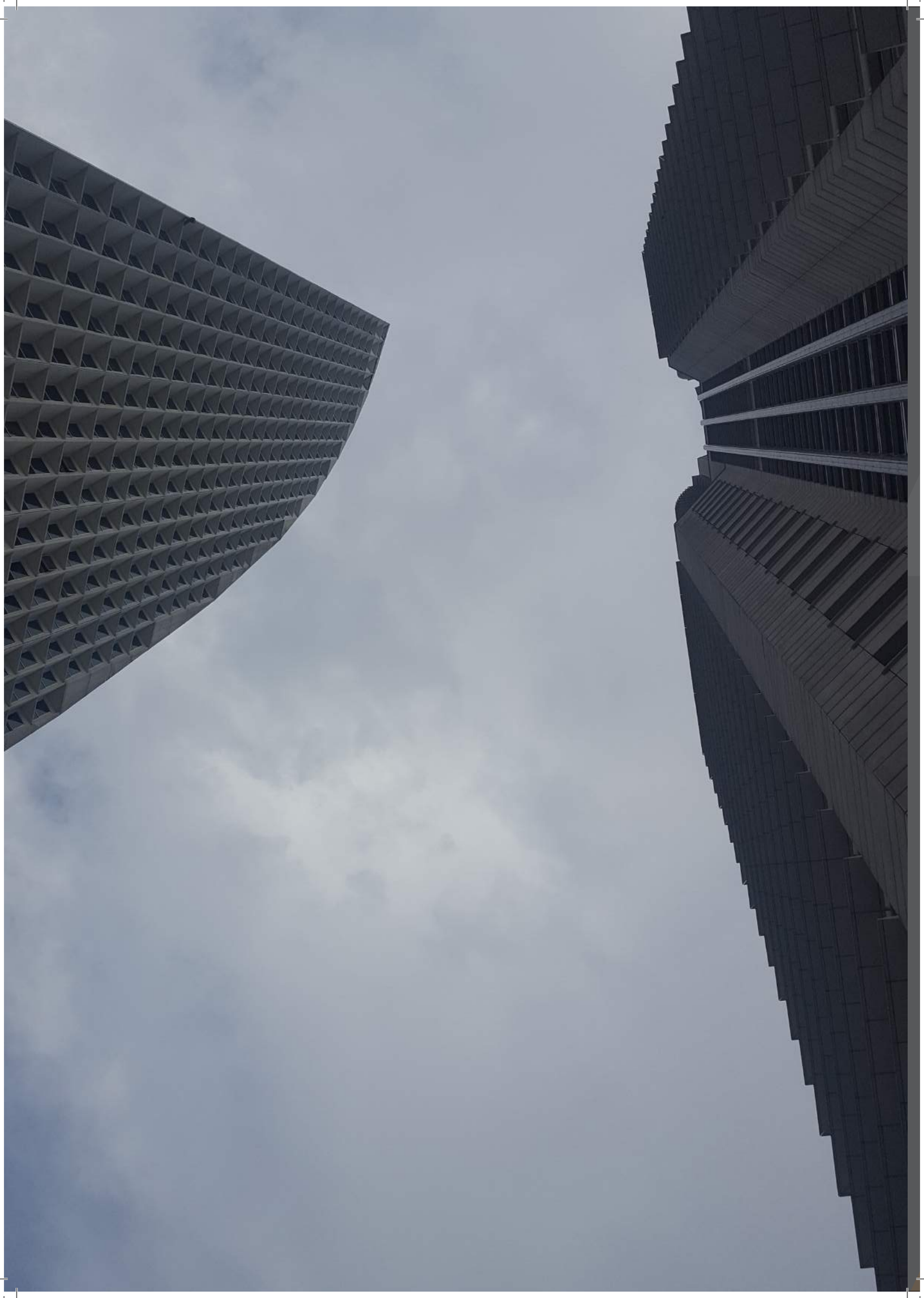

SECTION 2: **PERSPECTIVE**

CHAPTER 4:

Gobind Singh Deo: Internet for all

By **Sharmila Valli Narayanan**

Photos by **Song @Picture this Studio**

Gobind Singh Deo, Minister of Communications and Multimedia, firmly believes that the Internet is part of basic human rights and is pivotal to survival in today's world. That's why he wants telcos to increase the speed of broadband and reduce the price so that it's accessible to everyone.

It has been more than three months since Gobind Singh Deo took office as a minister under the Pakatan Harapan Government which won the historic 14th General Elections. It is a huge change for him from being in the Opposition to being in the ruling Government.

"Being in the Opposition was different - we need to know how to ask questions. Now that we are the Government, we need to know how to answer the questions!" he quips.

He continues: "I needed to find out the actual extent of the Communications and Multimedia Ministry (CMM), understand the various agencies that come under the purview of the ministry, study the issues that those agencies have to deal with and figure out the direction these agencies need to take. I spilt the goals of the ministry under short term, midterm and throughout the five-year tenure of the Government."

One of the targets close to his heart is to lower broadband prices with higher speed and improved service. By the end of 2018, fixed broadband prices are expected to be lower by at least 25%.

Malaysia has a lot of catching up to do compared to other countries when it comes to broadband connection.

According to the World Bank Malaysia Economic Monitor June 2018 report, the level of digital adoption by businesses in Malaysia "is average for a lower middle-income economy".

It states that only "62% of businesses are connected to the Internet, 46% have access to fixed broadband services, and 18% have some form of web presence".

The report says that high-speed broadband access rates are much higher in Malaysia. It ranks Malaysia 74 out of 167 countries for fixed broadband services, and 64 out of 118 for fibre broadband services, behind neighbouring Vietnam and countries with similar levels of economic development such as Mexico and Turkey.

Gobind is passionate about making high-speed broadband accessible to everyone in Malaysia because he strongly believes that "Internet access is a basic human right and pivotal for survival today".

His ministry is in the process of making amendments to the law to have the Internet classified as one of the essential utilities such as water and electricity.

"There will come a time in the near future when access to Internet is as vital as access to water and electricity. In the future when developers build houses, they'll have to ensure there's access to the Internet," he states.

There have been some criticism from telcos who complain that lower broadband prices will cut into their profits.

Share prices of most telcos went down when the Government announced its intention of doubling the broadband speed while reducing the cost by half.

Gobind doesn't buy this argument. "If the price of broadband is reduced and a better service package is offered, the company will increase its subscriber base as more people can now afford broadband. This in turn will increase the company's profitability. The reduction of price does not impact the profits."

Cybersecurity is also an issue of critical importance to the ministry especially since last year when Malaysia suffered the biggest data breach where over 42 million users' personal information were compromised.

Gobind hopes to get the final report on the incident by the end of the year before deciding what measures can be put into place to ensure that such incidents do not happen again.

Recently, the CMM took over CyberSecurity Malaysia, an agency which was previously under the Ministry of Science, Technology and Innovation (MOSTI).

"This is an agency which we can use to develop mechanisms by which we can enhance security measures to ensure that data is always protected," says Gobind.

Since data breaches are becoming more common and the perpetuators are generally from another country, during a meeting in Singapore where ministers discussed data breaches, Gobind raised the need for countries in the region to consider having cross border legislation to help one another during a cyber attack.

He hopes to discuss this further with other regional ministers the next time they meet.

"But before the regional cooperation can materialise, it's important to put in place regulations and enforcement agencies that are equipped and able to deal with threats fast and effectively and take it to a different level where we can engage with countries around the region first and then beyond. In years to come, there will be more cyber threats that will be from cross border," he says.

Next on his agenda is the revival of RTM. This venerable broadcasting institution is more than 70 years old.

"There will come a time in the near future when access to Internet is as vital as access to water and electricity. In the future when developers build houses, they'll have to ensure there's access to the Internet."

"Not everyone has access or can afford Astro. RTM is free and it has a reach no one has. We need to build on this momentum created by the World Cup to capture more viewers."

At one time, almost every household in the country was tuned to its radio and television stations. But over the last two decades, it lost its hold on the Malaysian radio and TV audience.

"RTM has somewhat been left behind with the advent of pay TV service providers and private radio stations," acknowledges Gobind. In an effort to revive it to become one of the premier broadcasting stations in the region, Gobind and his team have held many discussions and met many people to get their views and feedback.

One of the ministry's objectives is to try to increase the viewership and generate interest in the station's television and radio divisions. The decision to telecast many of the matches live on RTM television during the recent World Cup that was held in Russia was a huge success as it increased the viewership tremendously. RTM was able to reach a much wider audience, especially in the rural areas.

"Not everyone has access or can afford Astro. RTM is free and it has a reach no one has. We need to build on this momentum created by the World Cup to capture more viewers," he adds.

Some of the changes the ministry has instituted are giving the newsroom a facelift and bringing changes to its content. He has urged RTM to project a new, more aggressive image to increase its viewership figures within six months.

He has also pushed ahead with the Malaysia First Policy which focuses on local content, particularly among the Chinese and Indian communities.

For example, he launched ISAI.MY on RTM Minnal FM, the Tamil radio station. This programme is the new avatar of the very popular Kalapadam, a talent show, which first started broadcasting in 1957. Programmes such as these are part of the Government's push to grow the local music scene.

Another of RTM's jewels that has been revived is the RTM Orchestra.

"I was very impressed when I heard them play. I received a lot of positive feedback from the public for reviving it. Many of our best had their start here. It is the oldest orchestra in the country," says Gobind with pride.

In order to showcase its talent and to get as many Malaysians to see them perform live, the RTM Orchestra will perform on a monthly basis in different states with the support of the ministry.

Pos Malaysia has also caught the attention of his ministry. Once an indispensable part of Malaysian life, these days it has become less important as people prefer to pay their bills online and send emails instead of cards and letters.

However, the rise of e-commerce has revived the fortunes of Pos Malaysia; it has become the choice of many e-commerce companies to deliver their goods to their customers.

Today, Pos Malaysia has one of the largest courier services in the country. And with a presence all over the country, even in the most rural and isolated areas, it has a reach that cannot be matched by other courier companies.

The ministry is working with Pos Malaysia on how to leverage its nationwide presence. Among the ideas that are being considered is to change these post offices into a one-stop centre that provides various services at less cost and with a very wide reach.

There are also other suggestions that are being looked at, such as turning these post offices into WiFi hot spots, thereby bringing Internet to the furthest corner of Malaysia.

On another note, he shares some insight on his role as a minister.

"Being a minister is not easy as the hours are long and the days are packed. No one day is alike. Sometimes I start off the day outside the office by attending events. Some days I spend most of the time visiting various agencies within the ministry and when Parliament is in session you're expected to attend the session either to answer questions or you might be required to vote. This usually takes up the whole day."

The evenings, he says, are mostly spent meeting various people.

"Sometimes I have to watch movies, documentaries made by our local filmmakers who invite me to attend the premiers, etc, or attend shows like classical dance performances or performances by an orchestra. I can't attend all but I do try to attend to show the ministry's support for these events. Weekends, of course, are when you attend to the needs of the people in your constituency.

"Then, there's travel. Since becoming a minister, I've been travelling a lot overseas to international conferences where I am invited or expected to speak. In the next two months I'll be going to Japan, Korea, Dubai, Cannes and Bali.

"In short, it has been very hectic and tough. But we have to get the job done and I am pleased we have achieved some of our targets," adds Gobind.

This article first appeared in the inaugural issue of PIKOM's my.iT magazine.

"However, the rise of e-commerce has revived the fortunes of Pos Malaysia; it has become the choice of many e-commerce companies to deliver their goods to their customers."


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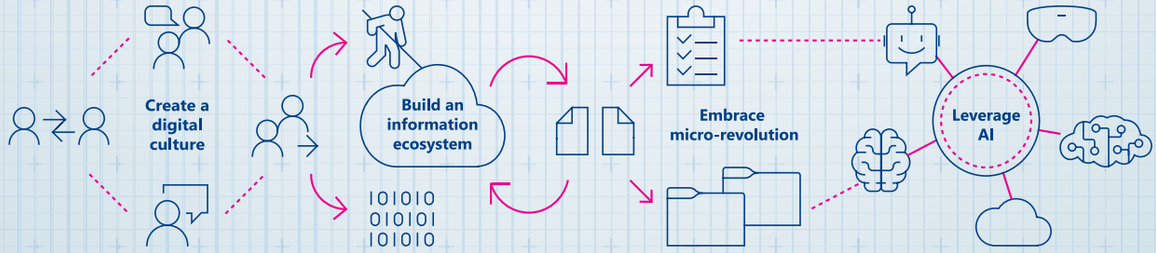
HOW TO BECOME A DIGITAL TRANSFORMATION LEADER



"Unlocking the Economic Impact of Digital Transformation in Asia Pacific" was conducted with 1,560 respondents in 15 economies by Microsoft Asia in partnership with IDC.

- 15 Asia Pacific economies involved: Australia, China, Hong Kong, Indonesia, India, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Sri Lanka, Taiwan, Thailand and Vietnam.
- Respondents are decision makers involved in shaping their organizations' digital strategy: 55% C-Suite, Vice Presidents and Directorial levels; 45% Senior Managers
- Business and IT leaders from organizations with more than 250 staff were polled.
- Industries polled included education, financial services, government, healthcare, manufacturing and retail.

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SECTION 3: **LEADERSHIP**

CHAPTER 5:

How to become a digital transformation leader?

K. Raman
Managing Director, Microsoft (Malaysia)

From our inception more than four decades ago, Microsoft has been a company on a mission to democratize and personalize technology for every person and every organization.

Microsoft's technology has contributed to the achievement of so many individuals, businesses, hospitals, or schools in every corner of the world.

Our platform saves lives, creates jobs, teaches children how to learn, makes people and businesses more productive, and sparks joy in the lives of others. Not many companies share our level of success, and with that our global commitment and responsibility.

Despite all that we've accomplished with our customers and partners and collectively as a technology industry, we believe society is only at the beginning of the digital era.

Today a new paradigm is emerging with the intelligent cloud and its intelligent edge, and Microsoft is positioned to take the lead. The work we do will empower people and the organizations they build.

The experiences and solutions that we create will unlock value for our customers. As businesses and societies look to transform, the work we do can help them ignite change and renewal.

It's remarkable how much technology has changed the way we live and work over the last decade or two. Digital technologies, powered by the cloud, have made us smarter and more productive, transforming how we communicate, learn, shop and play. And this is just the beginning.

Advances in artificial intelligence (AI) are giving rise to computing systems that can see, hear, learn and reason, creating new opportunities to improve education and healthcare, address poverty and achieve a more sustainable future.
In this context, organizations will also need to be digital-first to be relevant both today and tomorrow. While such a viewpoint may have been controversial five years ago, it is certainly not the case today as digital transformation is now a key item on the agenda for C-suites, boardrooms, and even governments.

We at Microsoft believe that digital transformation is not only about technology, it requires business leaders and organizations to re-envision existing business models and embrace different ways of bringing people, data, and processes together to create better or higher value for their customers.

Our Digital Transformation study of 2018 showed that there will be widespread disruption to the traditional business and operations models of all organizations – approximately 48% of South East Asia's GDP will be derived from digital products and services by 2021, created directly through the use of technologies.

In comparison, only 6% of South East Asia's GDP today is derived from digital products and services. This is the speed of change that all organizations must grapple with.

Imagine that you are operating a fast-fashion clothing chain in Malaysia. This means that by 2021, half of your business will be derived from online or digital channels.

The study has shown organizations are seeing significant and tangible benefits from their digital transformation efforts today.

The top five digital transformation benefits that organizations experienced include increased profit margins,

productivity, customer advocacy, loyalty & retention, cost reduction, and revenue from new products and services.

Even more interesting is that these digital transformation benefits are set to grow by 20% or more in Malaysia in three years.

To realize the full benefits of the digital ecosystem and emerging technologies like AI, we'll need to work together to create systems that people trust.

Ultimately, for AI to be trustworthy, we believe that it must be "human-centered" – designed in a way that augments human ingenuity and capabilities – and that its development and deployment must be guided by ethical principles that are deeply rooted in timeless values.

The Digital ecosystem and AI continue to transform the nature of work, we'll need to think in new ways about education, skills and training to ensure that people are prepared for the jobs of the future and businesses have access to the talent they need to succeed.

As traditional models of employment transform, we'll need to modernize legal frameworks to recognize new ways of working, provide adequate worker protections and maintain social safety nets.

To enable people to thrive in today's economy, and prepare for tomorrow's, we believe it's critical for us to focus on the following areas:

- **Preparing today's students:** Every young person should have the opportunity to study computer science. The skills they gain will open the door to higher-paying jobs in faster-growing fields. This means equitable access to rigorous and engaging computer science courses and a focus on uniquely human skills must be top priorities.
-
- **Supporting today's workers:** We must also help today's workers gain skills that are relevant in the changing workplace. Distance and online learning and investments in on-the-job training programs will be essential. And we'll also need to improve how we identify the skills that businesses need.

- **Creating a skills-based marketplace:** To help companies find qualified employees and enable workers to find jobs, we'll need to move from a degree-based system to one that uses credentials that are widely recognized and valued by employers.

- **Providing legal certainty for employers and workers:** The rise of the on-demand economy raises important questions that are not clearly addressed by existing laws about how we classify workers. To enable innovation and to protect workers, legal certainty must be created so that workers and businesses understand their rights and obligations.

- **Developing industry standards to protect workers:** Business leaders have an opportunity to play a significant role in reshaping employment policy in the emerging economy by setting their own standards for on-demand engagements that include fair pay and treatment for on-demand workers.

- **Ensuring benefits move with workers and modernizing social safety nets:** As the nature of work evolves with technology innovation, the traditional system of employer-

The Digital ecosystem and AI continue to transform the nature of work, we'll need to think in new ways about education, skills and training to ensure that people are prepared for the jobs of the future and businesses have access to the talent they need to succeed.

provided benefits and government-supported social safety needs to be reformed to provide adequate coverage for workers and a sustainable contribution structure for businesses.

We are optimistic about the opportunities that digitization and AI bring to create a better future for all.

To ensure that we realize this future, it will be essential for governments, businesses, academics and civil society to work together in creating trustworthy AI systems and prepare people for a world where the skills they need to succeed will be constantly changing.

This will require the development of AI in ways that are human-centered and can ensure broad and fair access to its benefits as we move forward together.

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CHAPTER 6:

Megatrends: Shaping our future

Koh Kong Meng
Managing Director, South East Asia & Korea
HP Inc.

Southeast Asia is at the centre of significant economic transformation and rapid urbanisation. By 2030, Southeast Asia's urban population will grow exponentially by an estimated 100 million people, from 280 million people today to 373 million people.

During the same period, the population of Malaysia is estimated to reach 36.8 million, an increase of 18% from 2018. Some 80% of Malaysia is reported to be urban by 2030, according to Martin Prosperity Institute.

Our region is set to experience the fastest growth in affluent households, the largest increase in young members of the workforce, and the highest outlook for GDP growth.

As we look forward to growth in the region and in Malaysia, we need to take advantage of the megatrends; rapid urbanisation, changing demographics, hyper globalisation and accelerated innovation.

It will change the way we live, work, and play. And HP is ready – with new solutions and energy – to aggressively pursue the new opportunities that the region has to offer.

Rapid urbanisation

By 2025, 5 billion people will live in cities, 2.5 billion of them itself will be in Asia.

Urbanisation will welcome an additional 1.8 billion consumers to the world economy, 95% of them in emerging markets like Malaysia.

An increase in urban consumers will change the way we, as consumers, buy and consume products & services – increasing the need for more personalised and localised services.

3D printing capabilities by industry leaders like HP will enable cities to respond to the growing and changing needs of individuals by printing on demand whatever is needed— for construction, entertainment, shopping, education – rather than relying on a physical supply chain. Using 3D printing, complex assemblies can be redesigned into a single part to simplify production.

As millions of people move to cities every week, they will also place a huge strain on space, city resources, energy requirements, and infrastructure costs, forcing homes, offices, and cities to become smarter and more efficient.

To address this, we are seeing a surge in the number of smart city and micro-living initiatives. In the past two years, the number of smart city initiatives has almost doubled.

As more people move to cities, demand for housing and co-working spaces is also on the rise with micro-housing and co-working spaces becoming growing trends across the globe.

Large corporations, like HP, along with governments and city officials need to address the opportunities and challenges posed by this rapid urbanisation.

Looking for ways to enable cities, homes and offices to be more sustainable and efficient. Creating new services customized to urban users in cities all over the world. Developing products and services with new classes of consumers in mind.

Changing demographics

Globally, people are living longer and having fewer children, accelerating the aging population – often referred to as the "silver generation".

This contributes to a significant rise in this population, one that is much more

tech-savvy, more committed to staying active and working day-to-day, and equipped with more spending power than ever before.

This will create a significant shift for brands who today devote most of their marketing spends to people under the age of 30.

On the other hand, we also have a substantial youth workforce. According to CBRE, millennials make up 25% of the total working population in Asia Pacific.

They are not just an age group; they represent a mindset and a way of working. When it comes to technology, millennials want outcomes and experiences, not just products. They want their products, solutions and information to interchange between work and play as quickly as they do. They want everything to be mobile and interactions to be increasingly social.

Catering to this diverse customer base that spans generations will require companies to rethink how they design products, structure their global labor force, and what benefits and services they provide.

Hyper-globalisation

The world we currently live in is a globalised world and it will only continue to accelerate. As the global economy continues to become more interconnected, innovators will be able to scale at an unprecedented rate.

There will be a true global stage on which everyone can compete. Malaysia has placed a heavy emphasis in the digital economy and initiated many programmes to accelerate this space – playing an increasing role in Malaysia's journey towards becoming a high-income nation. For us, that means access to incredible innovations and tech talent from around the world.

On the flip side, it means that we are opening ourselves up to new threats and cyber security risks. These will only continue to increase as the world becomes hyper-globalised.

There will be an increased emphasis on technology companies to innovate and achieve much higher degrees of trust and resilience. HP's Security Lab has several initiatives underway to tackle the growing landscape of cybersecurity threats and how HP is designing for cyber-resilience in a Blended Reality future.

Companies will need to help customers navigate constant disruption, smart and securely in an increasingly globalised world.

While at the same time, embarking on supplier and government partnerships that enable them to move manufacturing closer their customers. Enabling them to provide on-demand products customised based on geography and personal preference.

Accelerated innovation

Technological development is occurring at a rapid pace. There are many technologies out there that are produced faster, cheaper and even more powerful.

Automation technologies will improve business efficiencies and reduce head count, and this is already having profound effects on our personal and professional lives.

Responding to these changes will require a shift in business models and increased levels of digital literacy.

As technology components mature and become commoditized, they become the building blocks for new breakthroughs to emerge.

Looking for ways to enable cities, homes and offices to be more sustainable and efficient. Creating new services customized to urban users in cities all over the world. Developing products and services with new classes of consumers in mind.

Koh Kong Meng
Managing Director, South East Asia & Korea HP Inc.

Emerging technology trends like Hypermobility, 3D Transformation, Internet of ALL Things, and Smart Machines will harness advancements in computing power, connectivity and immersive computing to deliver richer experiences.

These advancements will blur the lines between our physical and digital worlds to make us more productive and more creative, freeing us to spend time with the people we love.

At HP, we call this Blended Reality: the fusing together of our physical and digital worlds, to create new and improved experiences for people.

In this ever-changing state of our world, information technology, cyber security and the demands put on us in the region are challenging, to say the least.

But I firmly believe that with every change comes opportunity; the opportunity to accelerate, to innovate, to change and to go faster. To put it simply, our customers are evolving. And so must HP

Conclusion

At HP, our strategy remains rooted in reinvention to meet the needs of our employees, customers and partners in the region.

We do this by executing across our focus on our core products, growth segments and future innovations. We spend a lot of time looking at and understanding the megatrends that are shaping the world around us, and that we believe will have a sustained, transformative impact on the world in the years ahead.

We believe that these megatrends will shape our human experiences with technology over the next several decades. These trends will provide the framework and context we use for identifying potential areas of “corporate whitespace” relevant to HP.

As much as we are eager with the speed of technological change, HP keeps to the culture of embedding diversity and inclusion into everything we do. Our mission to increase diversity does not stop at HP.

Working with HP means sharing vision to imagine the future and make things happen. Our diverse supply base demonstrates our commitment to small, minority-owned, women-owned, disability-owned, and veteran-owned businesses.

The digital workforce comprises people of all walks of background. By embedding diversity and inclusion, it helps us to deliver products and services that work for everyone and everywhere.

For us at HP, there is no such thing as business as usual. The world is changing, and we are going to leverage that change and create opportunity.

As we do this, we will deliver new value to our customers and drive the entire industry forward.

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CHAPTER 7:

The rise of digital entrepreneurship within today's sharing economy

MDEC

While the sharing economy has become increasingly accessible to the public with the emergence of digital platforms such as Grab within Malaysia and Southeast Asia - and Airbnb, which is touted as the world's largest hotel chain - this concept is not new, according to Malaysia Digital Economy Corporation (MDEC).

Traditional cultural behaviours such as pooling and sharing resources and services have been transformed by technology into potential new business models based on peer to peer sharing mechanisms or crowdsourcing, explained Nordarzy Razak Norhalim, who is MDEC's director of the Sharing Economy Ecosystem Division (SEED).

SEED implements many sharing economy initiatives, especially targeted to benefit the B40 group, who are Malaysians with median household income of RM3,000 a month or lower.

B40 is one of the three household income groups that Malaysians are categorised into by the Department of Statistics Malaysia: Top 20% (T20), Middle 40% (M40), and Bottom 40% (B40).

The median income of each group is used as one of the benchmarks of economic growth. (Department of Statistics Malaysia report 'Household Income and Basic Amenities Survey.')

MDEC, via its Sharing Economy Ecosystem Division, has implemented many initiatives, which are driven in collaboration together with other agencies under the stewardship of the Ministry of Communications and Multimedia.

"The sharing economy is driven by the participation of people in providing services through sharing of their resources and skills, and is disrupting incumbents in many economic sectors globally," said Nordarzy.

"We recognized that the sharing economy enables the Rakyat to generate income and become job creators in the long run."

Rapid upscaling of traditional systems

"Digital technologies have fuelled a rapid upscaling of traditional systems," he continued. This, coupled with the fact that Malaysians are used to a sharing culture, points to a fertile ground for growth.

How does the sharing sector fit into the bigger picture? He explained that the growth of Malaysia's startup community together with the sharing economy landscape is an early testament of Malaysia taking on the 4th industrial revolution.

What do business leaders need to do to stay on top of these changes?

"Businesses need to rethink their business model, relook at their internal operations, and review their products and services as the first phase of preparing for these opportunities."

"The Sharing Economy does present opportunities for companies in Malaysia." Nordarzy went on to detail possible courses of action, presented below in bulleted form:

- Focus more on the core-business e.g. a restaurant - serving good food and beverage - the sharing platforms can help to address and manage non-core activities such as food delivery.
- Reduce some of the operational costs by tapping on opportunities to crowdsource via sharing economy platforms.
- Discover new creative opportunities and do look and think beyond traditional ways of doing business.

Malaysian success stories

And what local platforms would you point out as success stories during 2017?

"One of the local platforms that stood out in 2017 would be ZeptoExpress, which provides on-demand delivery and logistic services," said Nordarzy.

"They provide game-changing delivery services whereby they are now offering their clients same day delivery services (within 3 hours)."

"Already, they are engaged in rapidly expanding their network of partners (crowd-sourced individuals who could do delivery - whether having car, motorbike or even on foot)," he added.

"Their strength also lies in their technology capabilities whereby they are also now offering usage of their fleet management software on a subscription basis. After a year in operation, they have managed to serve a total of 1,400 clients with 74% of them becoming returning customers."

Essentially, ZeptoExpress is a same-day last-mile delivery service promising deliveries within a 3 hour window, where customers are able to request for delivery service using mobile apps or website platforms.

Crowdsourced partners will be notified and once payment is made through ZeptoCredit, BillPlz or Paypal, the delivery service will begin immediately.

The company's intention is clearly to disrupt the urban logistics and on-demand delivery services, as well as to give citizens opportunities to earn income from taking up delivery assignments.

"As for local freelancing platforms, Malaysia has a number of active platforms such as kerjadigital.com and freetimeworkz.com," said Nordarzy.

"Although these are new in the market place, they are slowly building up their workers' profiles as well as pushing for demand from the local corporations."

Asked how local platforms compare with their foreign counterparts, he replied: "In the case of ZeptoExpress, a comparable model would be UberRUSH - a segment of Uber focusing on delivery services, Deliv (www.deliv.co) and Roadie (www.roadie.com). Most of the platforms in this category normally focus on certain specific locations or a country."

"In the case of ZeptoExpress, they are already expanding their distribution network to also cover other countries," said Nordarzy. "Indeed, in 2017, it already has coverage in London and is planning to expand to the Philippines and Vietnam by Q3 2018."

"These foreign or global platforms are far better in terms of technology, the supply and demand compared to local platforms," he admitted.

"As a freelancer, getting higher-paying gigs is not just a matter of signing up on popular global platforms like Upwork.com, freelancer.com, guru.com, 99design.com - just to a name a few. You will have to branch out, establish a great portfolio of past work and maybe even prove yourself through tests that showcase your skills."

"As the digital nomad lifestyle and other digitally inspired trends grow, I would expect the number of freelance resources to also keep pace and increase," Nordarzy explained.

"In the US, 57.3 million US citizens are freelancers and the freelancing economy in that country is worth US$1.4 trillion in 2017. And it's interesting that Fortune 500 companies have already started adopting on-demand talent."

Removing barriers

Returning to the question of opportunities for Malaysia, he pointed out that, "These low hanging fruits

"We recognized that the sharing economy enables the Rakyat to generate income and become job creators in the long run."

"In Malaysia, we believe that the Sharing Economy is creating a new phenomenon of full-time freelancers."

are unsurprisingly in the logistics and tourism sectors – which are local variations of global sharing platforms."

"However, even these quick-wins need to be supported with various enablers," he continued. "These enablers include reviewing regulations, encouraging direct market participation, enhancing literacy & awareness, as well as continuing to build an ecosystem that inspires innovation coupled with a solid digital infrastructure."

Sharing economy burgeoning well in urban areas

Nordarzy admitted that the sharing economy is burgeoning well in urban areas - "where there are plenty of under-utilised spaces - such as commercial, residential, and so on, assets - such as transportation, tools, and clothes, as well as a talent base of expertise and skills. All glued together with good internet connectivity, as well as high digital adoption."

"From the perspective of good governance, there is a need to look into the policies - for the benefit of both the sharing economy sector as well as for the people working in it," he said, adding that Malaysia's challenges fall mainly into the following areas:

- **Market/demand perspective:** There are trust issues as companies have yet to better understand and trust the sharing economy model), and there may be policy/regulatory constraints, as well as a residual resistance to change.
- **People perspective:** Again, it takes time to build trust as some consumers are used to a digitised sharing economy, wariness about personal tax declarations, and the need for a clear safety net for people/freelancers working in the sharing sector.
- **Crowd services players:** Sustainability needs to be built, and proven, as currently most platform players are startups, and reliability - in terms of quality and consistency of deliverables from freelancers - also at an infancy stage.

"Looking ahead, MDEC will continue fostering the growth of the sharing economy in Malaysia, with a couple of initiatives piloting in 2018 for tourism and logistic sharing economy," Nordarzy explained.

"We are also looking into other components for sharing economy enablers such as digital ID, e-payment interfaces and open data & API standards development."

"In Malaysia, we believe that the Sharing Economy is creating a new phenomenon of full-time freelancers," Nordarzy said.

"With this in mind, the Global Online Workforce (GLOW) programme - for highly skilled Malaysian professionals - will be expanded to benefit the M40 group - for them to be part of the global freelancing talents, the workforce of the future."

What kind of growth does Nordarzy expect in the near future?

"Malaysia only had five sharing economy players back in 2013, and by 2017, it had surpassed 70 players," he said.

"The players are mostly in the digitally enabled/crowd services category - where matching of demand to supply is done on a digital platform - but the actual work performed is manual such as running errands, delivery services, housekeeping and plumbing - with the services valued at an estimated RM95 million in 2017."

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CHAPTER 8:

Women & technology: The IBM differentiator

IBM Malaysia

Information technology has proven to be a transformative agent that has empowered communities and fuelled economic growth through the decades.

Ironically, at a time when opportunity in technology has never been greater, women are retreating from the fields of science and technology at alarming rates.

Recent global reports indicate women make up less than a half of students enrolled in Science, Technology, Engineering and Mathematics (STEM) degree courses.

In Malaysia, national statistics indicate that the number of women undergraduates in STEM courses had fallen by half in the past decade. By 2015, women made up less than half of the graduates in engineering and technology. Of that number, more than half did not pursue careers in technology.

Women participation in the Malaysian workforce for 2018 is 54% compared to Singapore (66%), Thailand (70%), Cambodia (77.9%) and Laos (81.2%).

However, the beacon of hope can be seen in IBM with its strong heritage and leadership in Diversity and Inclusion. In IBM Malaysia, women make up more than half the workforce and 30% of them are in leadership and management roles.

In fact, three key positions in IBM Malaysia - the CEO, CFO and CHRO - are helmed by women.

To ensure that women are uplifted, the leadership at IBM Malaysia collaborate to appoint women advocates across functions to continually champion a culture of inclusiveness.

Aspiring and young women of talent are nurtured and encouraged to join various internal and external activities such as ICAEW-Women in Leadership, LeadWomen's Women Directors Programme, TED-inspired talks, panels, roundtables and community conversations.

Breaking Barriers to STEMs

One of the biggest challenges facing the uptake of careers in STEM by women is the conscious and unconscious gender stereotypes propagated by society that the field is reserved for men. This inadvertently shapes the choices young girls make about their futures.

Certain messages coded in curricula, textbooks and the media can reinforce long-standing gender biases.

They perpetuate notions that men are cut out for certain professions, such as engineering, while women are more suited to others like nursing which discourage young women from enrolling for and completing STEM degrees.

IBM CEO Ginni Rometty once noted: "You can't be what you can't see."

A study by the Center for Talent Innovation underscores the notion. The study found that 27% of women in tech feel stalled in their careers and 32% are

IBM CEO Ginni Rometty once noted: "You can't be what you can't see."

The IBM workforce in Malaysia averages 47 hours in education to acquire new skills in areas like blockchain, cloud, analytics and cybersecurity. This translates to more than 70,000 hours of training for the women population here.

likely to quit within one year.
In the face of such challenges, it has become vital to continually highlight achievements by women over the course of history, especially those emerging from STEM careers.

For example, the first ever compiler tools for the Harvard Mark I computer was developed by Rear Admiral Grace Hopper in 1952. Today, the world's fastest supercomputer, the IBM Summit, is being run by two women engineers. One of IBM's most prolific inventor is Lisa Seacat Deluca with over 600 patents in her name.

Closer to home is software development engineer Chong Chye Neo, who rose to become the first woman managing director for IBM in Malaysia.

Thriving in the new era

A recent study by the Boston College Center of Work & Family found that opportunities for women in STEM are driven by inclusion across career environments, empowerment to think freely and the ability for women to bring their 'whole selves' to work.

Nurturing a steadfast belief in the positive role of women is high on IBM's agenda.

Rometty reiterated that IBM thinks about diversity the way we think about innovation - both are essential to the success of its business. When we innovate, technology becomes smarter for clients and creates new opportunities for growth.

The IBM workforce in Malaysia averages 47 hours in education to acquire new skills in areas like blockchain, cloud, analytics and cybersecurity. This translates to more than 70,000 hours of training for the women population here.

IBM's commitment to diversity, lived out through its policies and workplace practices, has been widely recognised by the industry.

For the fourth year in a row, IBM is a recipient of the Catalyst Award for its leadership in building a workplace that values diversity and inclusion.

IBM has earned a spot on the Working Mother 100 Best Companies list for 33 years. It has also earned spots on the Best Companies for Multicultural Women and NAFE Top Companies for Executive Women lists and the Diversity Best Practices Inclusion Index.

For industries and businesses to thrive, it is clear that gender parity is fundamental.

Three ways to raise equity at the table

1) **Identify talent early:**
Managers identify employees who are one, two and three levels below the executive level - but already display extraordinary leadership - and initiate a development journey for them.

2) **Focus on both technical and** non-technical women:
It is imperative to prioritise women for potential technical leadership roles and develop programmes to advance women in those roles. An instance is to develop a 'pipeline' of talent aligning mid-career women with an executive coach and sponsor. Other programs include offering face-to-face workshops and learning labs, and creating a development roadmap to track progress and readiness for the next milestone in technical women's career paths. Beyond the technical aspect of technology, there is an important place for non-technical skills: Expertise in new media, social media strategy, online business models, digital marketing, e-commerce, gadgets, and information technology infrastructure, which are all essential to the technology ecosystem. These are also important skills and it is important to assist the women access training and educational opportunities in this field too.

3) **Lift up women everywhere:**
Around the community and not just the workplace. It is not only vital but prudent to ensure that communities around us are also empowered. One way to do this is to partner with organisations that are directly working with women and exploring synergies in which women in the community can be equipped with ICT skills.

Research has shown a clear positive link between increased gender diversity and financial results across different industries and countries.

The role played by women cannot be discounted, trivialised or minimised. Women must be present and well represented in STEM to drive innovation across all industries.

"Anything's possible," - Lisa Seacat Deluca

DeLuca is a distinguished engineer, inventor, and Director of offerings specialising in the internet of things (IoT) and running the IoT Building Insights team, an offering that aims to reduce energy usage and improve occupancy experiences within buildings.

By tapping into the endless stream of IoT data, DeLuca dreams up data-driven innovations that will solve every day problems.

Born and raised in Helena, Montana, DeLuca has always been interested in computers, gadgetry and playing video games.

She took up programming classes in senior high after she had already been accepted to Carnegie Mellon University to pursue a computer science degree.

She joined IBM upon graduating in 2005 and filed her first patent in 2006, and has followed it up with more than 600 patent applications – and 400 patents issued to date!

DeLuca is the creative mind behind a vehicle-based GPS that can pick up location data from things like a hotel-room key card; a necklace that lights up every time a given Twitter hashtag is used; a mechanism for identifying exactly what a truck is actually carrying so the ads on the outside can be adjusted on the fly (maximising ad revenue); and an alert that notifies you when a topic of interest comes up during a conference call.

Her current project allows facilities managers to make sense of the numerous sensors across their entire enterprise, then analyses the data using machine learning algorithms for anomaly detection and energy and occupancy prediction – a solution that will help make our enterprises smarter.

DeLuca is the only woman in IBM's history to receive the 100th Plateau Achievement Award, an internal award system at IBM that has recognised less than 20 IBMers ever.

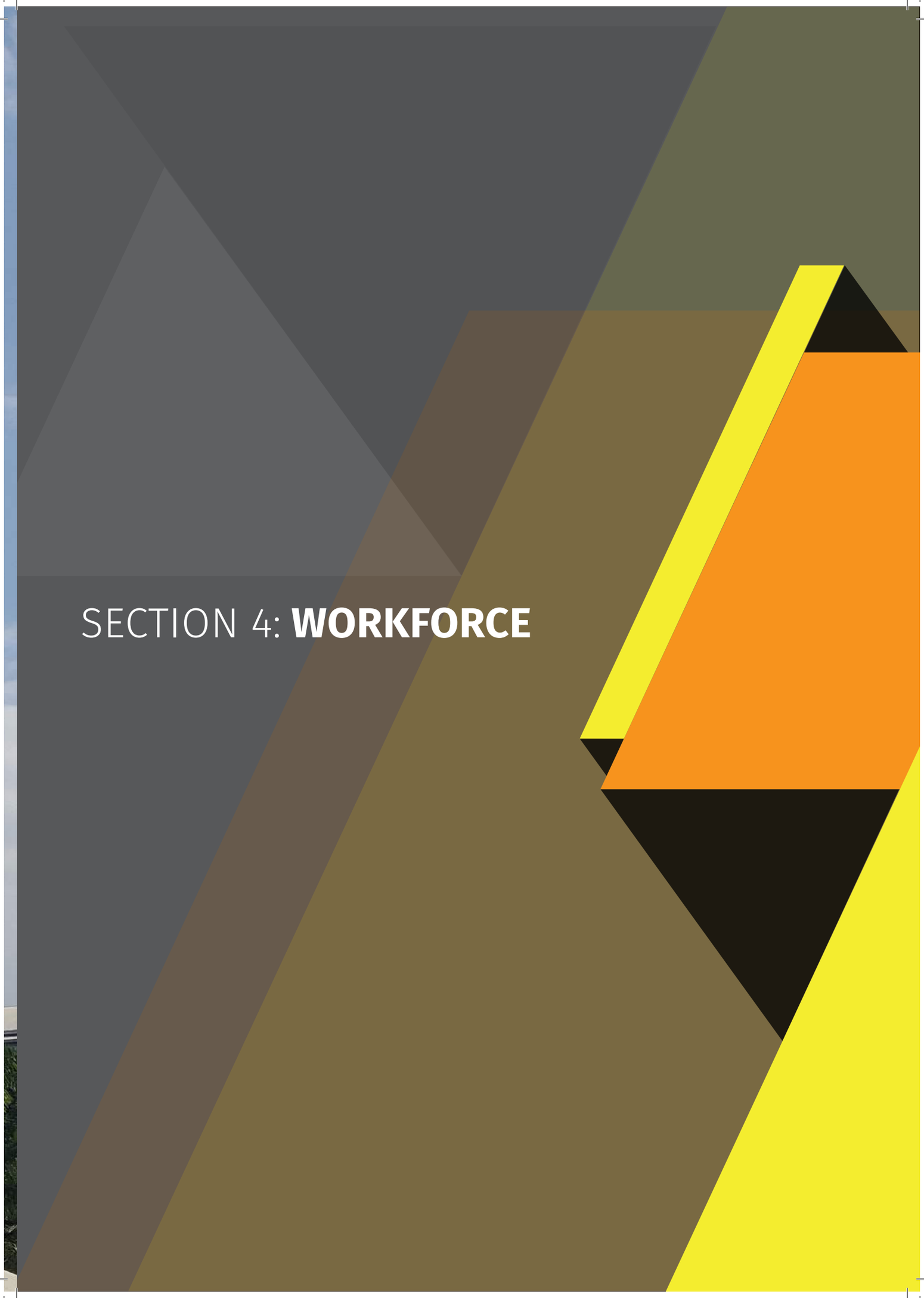
In addition to being a prolific young inventor, DeLuca is the self-published author of two children's books, 'A Robot Story' - teaching kids how to count to ten in binary - and 'The Internet of Mysterious Things' - the first-ever children's book that uses NFC tags to explain how IoT devices work; the founder of SplitTix, a start-up hoping to revolutionise the live event experience; a committer in the Apache Cordova open source community; an ambassador for the American Association for the Advancement of Science and Lemelson Foundation's initiative to encourage young inventors; DeLuca is a mother to twin boys AND twin girls.

Advice from Lisa:

Passion: If you love what you do, it's easy to become a recognised leader in your field. It becomes more than just a job, it is a hobby and that love will shine through on the projects you work on. That positive energy will also inspire your co-workers for final projects everyone can be proud of.

Ideas: Coming up with new ideas is the easy part of innovating. Anyone can come up with ideas very quickly. It's taking the time to write them down and do research to figure out if it's a great idea or how to make it an even better idea - that's really the bottleneck in innovation.

Risk: As Lisa's father always advised her, "you can't turn them down until it's offered." Don't turn yourself down before giving yourself that opportunity to fail. It's all about taking chances on yourself and be willing to learn new things. Try out STEM internships to see what STEM professionals do in real life on a day to day basis. The exposure to things you've never done before is critical in finding out if the career is something you might enjoy.

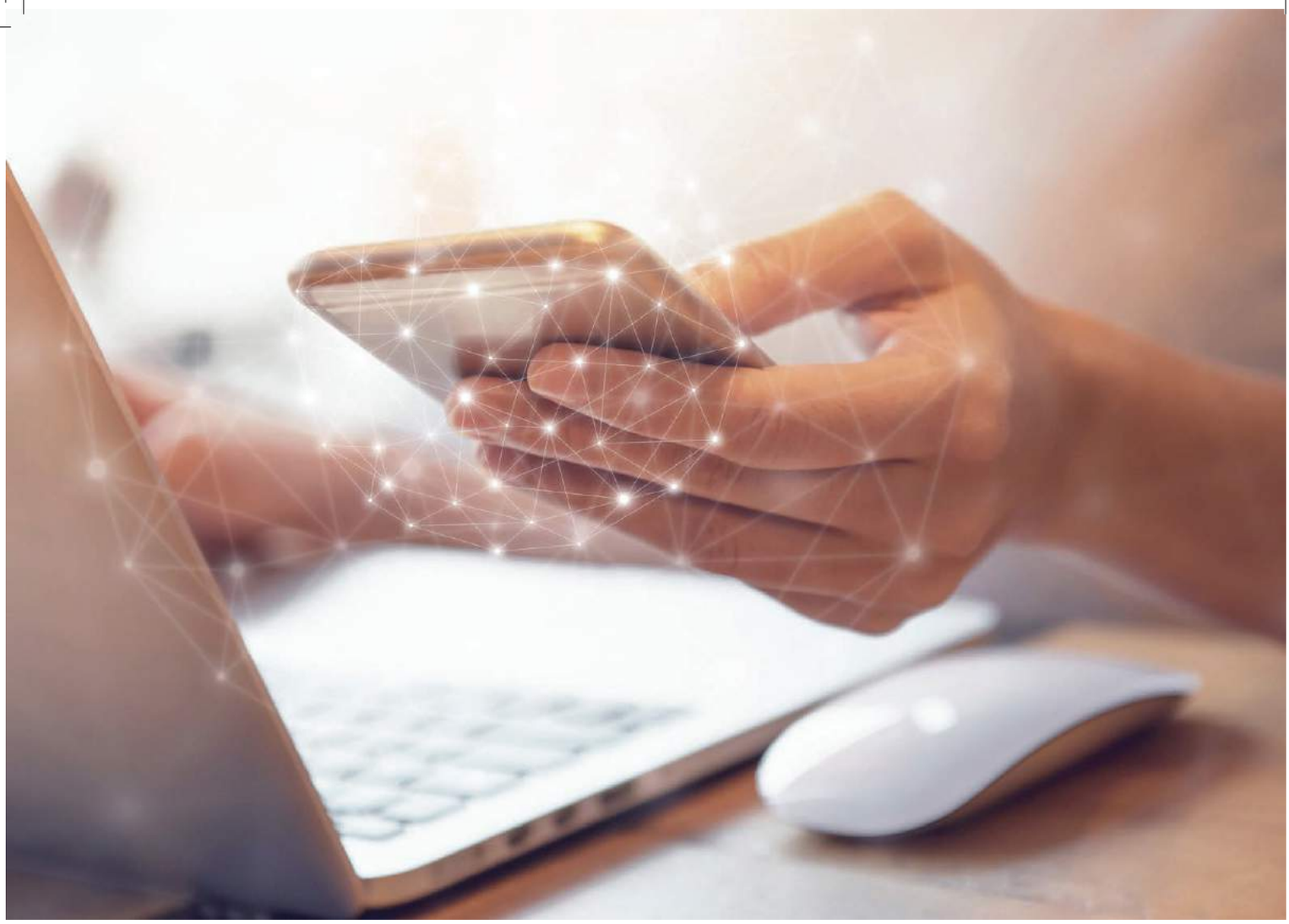


SECTION 4: **WORKFORCE**

CHAPTER 9:

The HR digitisation race: Your key to digital success

Persolkelly



Every business is a software business. Paper was a revolutionary product and gave birth to millions of monopolies all over the world. It shaped the world as we know it today. However, all good things must come to an end.

Similarly, with competition at its peak, good companies which fail to capitalise on latest trends will fall behind and soon perish.

The marketplace today is strictly digital or pushing towards it. Studies show 72% of the community wants a digital marketplace.

Unfortunately, data also reveals very few are actually ready for this change. The White paper organisations must change, evolve their recruitment and management process to meet the urgent demands of the rapidly digitised world.

A successful company of the future will be efficient with their data, look at statistics and make the workplace easier for everyone involved.

The data will be used to drive growth and create unique business models that improve business. From giant conglomerates to tiny start-ups, the race to go digital is in full swing.

Companies are hoping to foster a sense of agility, creativity, and freedom which was never possible with a white paper set up.

Why should you digitise your human resource?

It's true that millennials are different from the past generation. They have ready access to technology the previous generations never thought about.

Naturally, they are better at using tech. This has led to a common misconception that tech is for the youth.

Though tech is most widely appreciated by the young, it isn't limited to anyone. Any age group can access tech and have an easier time doing things. While today's youth won't understand the pain of a desk full of papers or a slow internet, everyone can benefit from the move to a digital future.

Digitising the organisation makes things simpler, even when it may involve some investment in the present.

Improves employee experience

Employees are probably the most integral part of an organisation. They are the wheels that drive an organisation forward.

A happy employee will, in turn, lead to a happy customer. Digitisation has revolutionised customer experience.

An interaction between a customer and an enterprise includes a social media aspect; for example, the customer might never buy from you but may still be a fan of your product.

Digital media will drive the same level of engagement between the employee and the employer. A digital workplace makes for a more collaborative and independent workplace, which boosts morale and drives performance.

The employee experience is a staple to growth and creating an internal social aspect is one way to improve worker experience.

For example, an email might be the way to go for most HRs but a video message doesn't hurt. A video message creates a form of intimacy that's hard to replicate via emails.

Promotes workforce mobility

In the 1990s, visiting a corporate office would give you a much different impression from today. Everyone dressed in ties and concentrated in their small cubicles staring at a bulky monitor.

A workplace today is clean and interactive. A water fountain is a place for chitchat. People don't sit in cubicles but have desks that make interactions possible. Companies have a huge lobby where you are bound to run into employees from other departments.

For companies with offices all around the world, digitisation can also promote a sense of community.

Companies are moving towards a virtual workplace and technology is a core fundamental to this phenomenon.

No matter where you are from, you can just log in and have a conference from anywhere around the world. Not to mention, remote workers have lower stress levels, display better performance.

Gamifying the workplace

Fun activities are a great way to keep kids engaged in schools. They keep their stress levels low. They are a welcome change from the bookish classrooms and help foster the bond between classmates.

Similarly, in the corporate world, gamification is quickly taking its place as part of the employee experience.

Getting a small discount on a purchase or getting reward points for some fun activities is always a fun to have.

The small badges or designations really boost our morale. It enforces a sense

An interaction between a customer and an enterprise includes a social media aspect; for example, the customer might never buy from you but may still be a fan of your product.

of family which was hard to achieve beforehand.

With digitisation, it is super easy to keep track of millions of people. Streamlining important processes has helped us expand and create more engaging systems, things that would never have been possible without technology.

Now, companies aiming to promote employee welfare are trying to infuse the gamification element in their workplace. Gamification improves engagement and employees' experience. And it is surprisingly easy to fuse gamification with work.

For example, most employees must complete different compliance tests and activities. Firms can award achievement levels and badges for quicker work and top performers, which can be showcased to all employees.

So instead of just finishing the job, they would want to be the best at it and get the job done quickly and efficiently.

Challenges to digitisation

Technology is a boon for the modern world with its tremendous potential. However, the conventional pessimists think differently.

The argument that tech can make us less productive because of the distraction element is viable but not today.

If an employee wants to be inefficient, he doesn't need a device or excuse to be so. There are multiple ways to be unproductive.

But for a diligent employee, it can increase productivity ten folds. Orthodox thinking like this has led to stuttered growth in some departments.

Digitisation also comes with a risk of over digitisation. Sometimes, automating every process can make it robotic and take the compassion out of work.

Greeting your employee with an email might be great, but handing a termination letter via email is a disastrous scenario and horrible PR.

There are some areas where we need to tread lightly. Human beings are social animals and taking it away from them is never good for the organisation. Technology is an enabler and not a replacement. Hiring employees via an integrated software is not right.

Smart automation and creative digitisation is a boon but the same can be a curse in many instances. It is ultimately up to us to decide how we move forward with digitisation and shape our destinies.

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Attracting the right talents

Hiring the right candidates these days has become a challenge in a tough labour market. This problem arises because employers find it difficult to attract the relevant candidates.

In a recent candidate study by Australian-based Research Ink on Malaysians talent, 73% of them were actively searching for new opportunities while around 25% of candidates who found jobs were actually monitoring when they got the job. This state of mind is an important engagement barometer.

Active candidates are always actively on the lookout for new career opportunities. Individuals from this category always keep applying and majority of them are fresh graduates, while monitoring candidates are individuals who only browse job ads but do not apply.

Meanwhile, what an active candidate looks for in a career opportunity would totally differ from a candidate who only monitors. It would certainly take more to persuade a monitoring candidate than an active candidate on accepting a job offer.

For a monitoring candidate, job alerts and prompt notifications would be the important engagement tools to inform them of such career opportunities. Besides these tools, Company Reviews, a much sought after feature from JobStreet.com also provides vital information to candidates on their future employer.

Thus, more transparent information directly from the company would persuade the right talent to make the decision to pursue a new career opportunity.

Ratings and reviews have become a norm in the travel industry. Expect the same when talents search for career opportunities. Hence, it is not only important to describe a company's employee value proposition (EVP) but also show relevant rating and reviews from peers.

Having been able to understand the candidates' needs; it is also very important to understand employers' expectation. With the employers in mind, JobStreet's SiVA Recruitment Centre has been revamped and upgraded to a new platform.

The SiVA Recruitment Centre is developed as one-stop online recruitment solution that is easy to use, matching employers to their ideal candidates faster, anytime, anywhere.

HR and Hiring managers can collaborate to screen candidates' applications to achieve a joint hiring decision faster. Multiple candidate cards that are displayed on the search landing page will also ease the decision making process.

The candidates are ranked based on relevancy, screened by new search filters that find the most suitable candidates by location, industry, language, years of experience.

Meanwhile, Talent Search, an enhancement of the previous Resume Search, is an additional feature in the new SiVA Recruitment Centre, which allows hirers to source top caliber talents beyond the available job applicants.

Contact us to learn more at marketing-kl@jobstreet.com

CHAPTER 10:

The importance of HR analytics and why HR should embrace it

JobStreet.com

Historically, technical terms such as big data and analytics are commonly associated with computer nerds and data geeks.

Today, these terms are everywhere. Big data and analytics are largely used in marketing, customer service, operations and even human resources (HR).

HR professionals today need to realise that the HR landscape is more complex than ever and embracing these new technical skills will help them make strategic HR decisions.

First, let us start by understanding the definition of these terms.

The term "big data" refers to a large collection of data sets that needs to be analysed computationally to reveal insightful information on employee, customer or transactional data.

These valuable information can help in making good business decisions. Often, these sets of data are so large and complex that it becomes quite impossible to process them using traditional data-processing methods.

Analytics is the process that relies on simultaneous application of statistics, computer programming and operations research to discover and reveal such valuable information from these big data.

When it comes to HR analytics, it simply refers to applying analytic processes in the HR department, namely its people data.

In short, HR analytics enables HR professionals to gain a deeper understanding into their workforce and use this knowledge to provide the best solutions to business issues.

Here are some credible reasons as to why you need to leverage on HR analytics:

1. Better insights

A typical HR department has tonnes of data in various systems, however the insights and intelligence of these data are seldom extracted simply because it is too time-consuming and complicated.

These readily available, unused sets of data have the ability to bring better insights such as identifying top performers or list out employees who are struggling in their tasks.

This leads to better decision-making when it comes to employee promotions or planning an employee training programme.

2. Better influence

A good HR data interpreter will have the ability to spot trends and answer specific questions such as "Why is there such a high turnover rate in the company?".

HR can now have a better influence in management's decision-making with strong evidence of their data, putting them at the same level as data-driven divisions such as finance, sales and marketing.

A result-oriented HR department with substantial data will appear more business-like and demands greater respect and attention from other business divisions.

3. Better hires & retention

Rather than relying on "gut feelings", the ability to analyse a good set of data can help HR professionals weed out bad applicants and avoid bad hires.

Predictive analytics allow HR to foresee the right people to hire and identify who are most likely to become successful leaders.

By analysing these sets of data, HR can also understand why some employees leave, and why they stay.

This can help HR plan for a better recruitment strategy as well as strategies to boost employee engagement plan.

4. Better prepared

It is always better to be prepared than to be caught off-guard. HR analytics helps you fully understand what is currently happening and what is required to keep the business operations running smoothly.

In fact, generally, whatever that is measured will likely receive rectification and an improvement when errors are highlighted.

Continuous improvement will then dramatically reduce the number of weak decisions and lower the rates of error.

Similar to how analytics has changed the field of every other business aspect, HR analytics is changing the field of HR.

Like it or not, HR's ability to harness and grasp modern technology will dictate just how far a business can go.

HR professionals who want to succeed in today's competitive digital world must be able to learn fast and adapt to the changing business trends.

It might be big data and analytics today, but you'll never know what new trends are coming just around the corner so it's best to always be versatile and arm yourself with all the necessary knowledge you need to gain any immediate opportunities.


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CHAPTER 11:

Is HR really going to see a human vs robot war? Myth vs reality

JobStreet.com

The scare of *robo-takeover* is a bit too loud. Yes, artificial intelligence is taking over quite a few human roles, in every field; including Human Resource Management but what we really need to see is: will this automation make HR redundant or facilitate it? Are we really going to face a wipeout of HR jobs or do we need to be on the lookout for which roles are being taken over and which ones are being empowered.

More than any other category, HR is one segment true to its name '***Human Resource***'.

This sector is one that will always rely on EQ and human relationships making it impossible to be taken over by automation completely. However what will help it foster is augmented intelligence; softwares that are being built to help human processes.

There will be certain human resource roles that will be automated (not taking over an employee but giving them more time to engage in more productive tasks).

Automated resume screening:

Out of the very mundane jobs of an HR manager, one is to sift through stacks of resumes to identify candidates that match the objective of the job you are trying to fill. This task has been taken over by various types of resume screening softwares.

These softwares are a whole category within themselves: varying from the kind of solutions they can provide to you to different kind of processes they use to help reduce the use of manpower in this field.

Some resume screeners are customised; they work with the applications that have been sent to you by candidates as a response to your job vacancy (that was posted by your company online on your website, facebook page or other recruitment websites). The software is fed with keywords that you are looking for in your candidate. It then matches those with the resumes received and filters out the non relevant ones while keeping those that match your required qualification, experience, interests, education and so on.

While these softwares do the job of basic matching and choosing, there are softwares that go further ahead by pulling information and characteristics of selected applicants from their registered profile.

A good example is 'SiVA Recruitment Centre' by JobStreet.com.

It's an integrated candidate management platform that streamlines the recruitment process to do less with more. The SiVA Recruitment Centre allows employers to fast track talent sourcing, screening and job application processing all in one platform anytime, anywhere.

This however does not mean that these softwares have taken over the job of an HR manager. Instead this task is so basic that once automated, it leaves an HR manager with more time to focus on policies and strategies that require EQ more than a coded function of the brain.

Recruitment chatbots:

It might sound like a sci fi movie but we have reached the point in technology where we can launch a complaint to an automated customer service representative. Not just that, we are also most likely to be interviewed by a chatbot, if we happen to apply for a job.

What exactly are Chatbots? A Chatbot is a software that interacts and converses with people on the internet.

Today's Chatbots use AI and Language interpretation to assess a candidate. These softwares are backed up to ask various questions and give answers about the environment of a company, the policies they have and the benefits they offer.

XOR, Job Pal and Stanley (by Talkpush) are other recruitment chatbots.

Digital interviews:

The painstaking process of sitting and repeating the same questions over and over again with multiple candidates has been totally swept out and revolutionised by digital interviewing software.

These programs evaluate candidates with 4 - 6 open ended questions. gather data by assessing the verbal response, intonation, speech pattern, facial expressions and non-verbal gestures.

Some of these softwares can be customised as per your company's hiring needs. They are mobile friendly and work well with both IOS and Android.

HR is here to stay:

With the given advancements in technology, HR professionals have nothing to fear.

Their jobs are least likely to be taken over by automation. Human Resource handling involves roles that depend on Emotional Quotient and intelligence. There are things that need to be dealt man to man, heart to heart and mind to mind, which makes it very clear that bots or robots are not taking over this category in the near future.

What is happening is bright with positivity. This is one field that has been highly aided by technology. The automation in this category has helped come up with solutions to make work faster and less painstaking, giving more time to HR managers to build relationships and work on employee enhancement.

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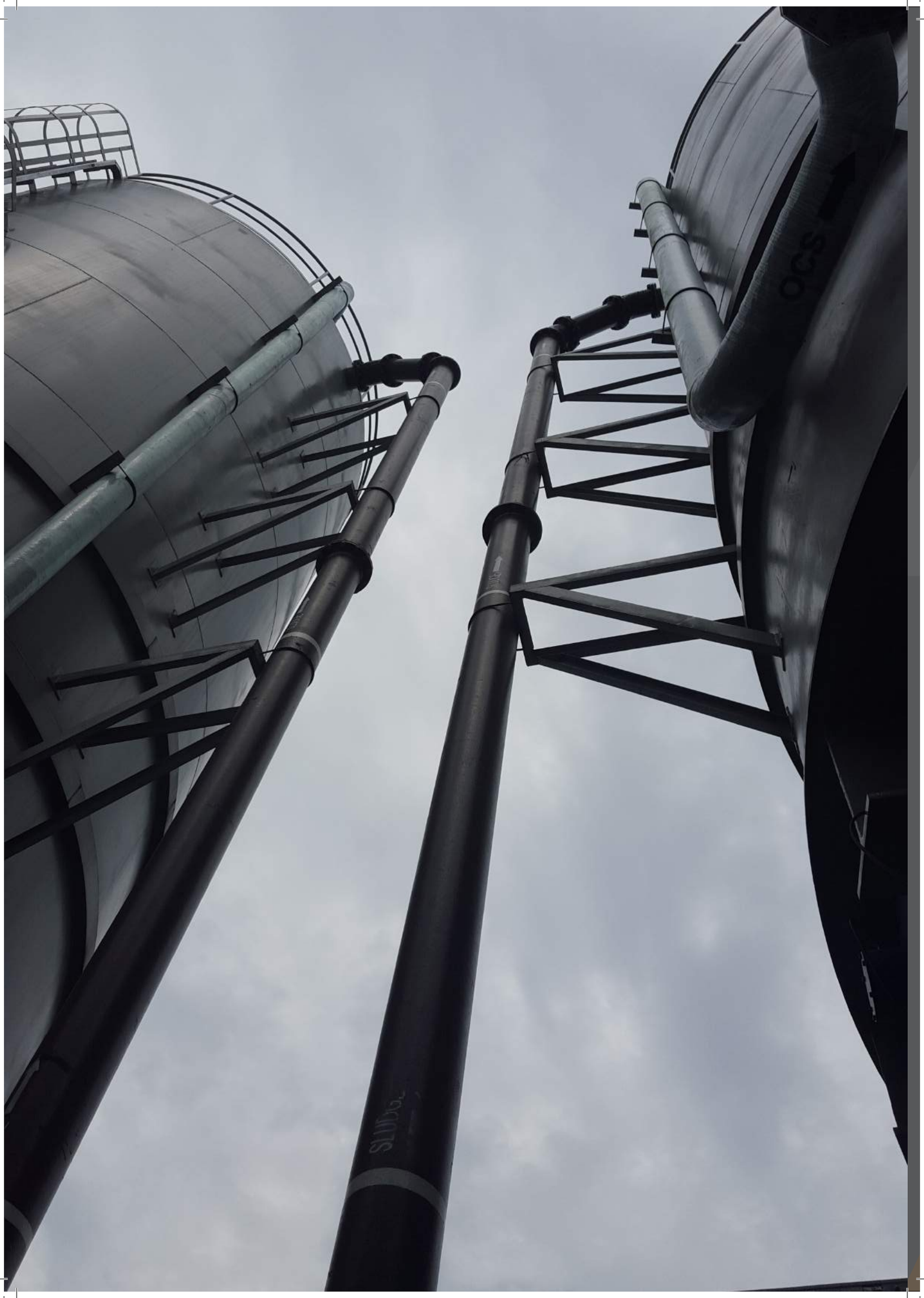

SECTION 5: **TECHNOLOGY**


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CHAPTER 12:

Blockchain: Building a futureproof business

Stephen Chia
NEM Southeast Asia

Hearing the buzzwords "Fourth Industrial Revolution (4IR)" or "Digital Transformation" no longer raises puzzled looks. That doesn't come as a surprise — it is being applied to everything from banking to payment, and even unconventional sectors such as healthcare and agriculture.

A host of emerging, disruptive technologies powering 4IR – artificial intelligence, machine learning, augmented / virtual reality, robotics, IoT (in its second push), blockchain and so on are destined to reshape the business world.

Consider this: A recent report by Microsoft found that by 2021, digital transformation will add an estimated USD1.16 trillion to Asia Pacific's GDP, 60% of which will be derived from digital products or services.

While 85% of organizations in the region are in the midst of their digital transformation journey, only 7% can be classified as Digital Leaders.

As the lines between technology and the real world increasingly blurs, the message is clear – to survive and thrive in a digital ecosystem of the future, businesses need to take technology seriously and transform today.

Blockchain, in its simplest form, means a digital distributed ledger, which – when applied correctly – brings enormous advantages to organizations which are looking to stay ahead of the competition.

From legacy mediocracy to greater transparency, security and efficiency

The first and foremost thought on most business leaders' minds is this: how will investing in blockchain benefit my business?

Across many industries around the world, forward-thinking companies are already applying blockchain technology to disrupt and migrate from legacy business models, and as a result, they are seeing significant business benefits including greater transparency, increased efficiency such as speed of transactions and enhanced security. All of these put together enables overall reduced costs.

Because blockchain is a type of distributed ledger, all 'participants' or 'nodes' in the chain share the same documentation which can only be updated when everyone agrees to it.

To change a single transaction record would require the agreement (or collusion) of the entire network, which would be highly improbable. This makes data on a blockchain more accurate, consistent and transparent.

In terms of security, blockchain is a much better alternative compared to other traditional book keeping systems. Firstly, as mentioned before, data is stored across a network of computers instead of on a single server, which forms the 'blockchain'.

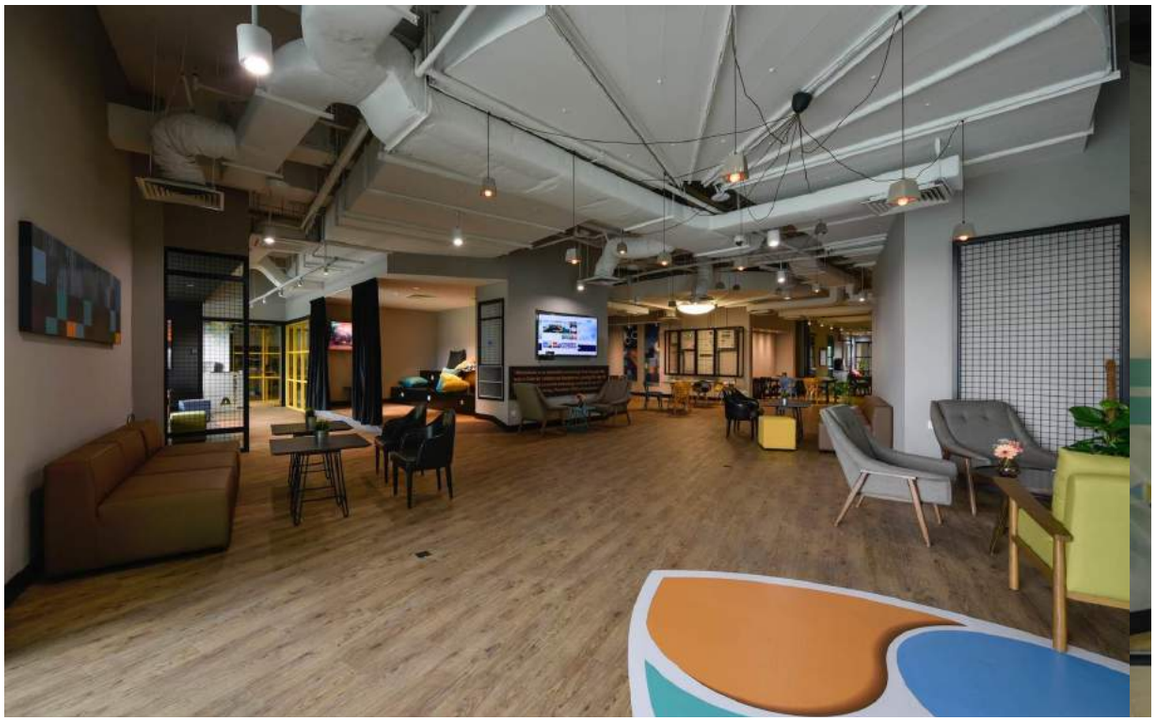
Next, a transaction must be agreed upon by the entire network before it is recorded, after which it is encrypted and linked to the previous transaction.

These two facts make it very difficult for hackers to compromise the transaction data. In any industry which involves sensitive data such as financial services and government, healthcare, this is crucial in revolutionizing how critical information is stored or shared to prevent fraud and security breaches.

Speaking of traditional systems, they are usually paper-heavy processes

Not only do companies have to think about digital natives – start-ups and businesses born in the cloud – they have to take into account established businesses proactively transforming into digital businesses, modernising their architectures and embedding high levels of automation into their operations.

Security and privacy are never far off the list of considerations, so think of a platform that offers a degree of both security and privacy as far as use of assets and data is concerned.



which are time-consuming processes prone to human errors.

For example, it is common for different participants to have their own copy of the same document, or in the case of digital copies, different versions.

By building the system on a blockchain foundation, transactions are recorded using a single digital ledger that is shared among all participants so you don't have to reconcile multiple ledgers.

As a result, there is less clutter, and clearing and settlement can occur much quicker when everyone has access to the same information.

Stay ahead, not behind

Competition notwithstanding, the Malaysian government has also begun looking into the potential of blockchain technology.

New standards are being drafted by the Department of Standards, and focus is given to industries deemed as "pace-setters" in the country.

For starters, 10 new standards will be introduced on blockchain technology, with three expected to be ready in 2019.

Application-wise, the Malaysian Industry-Government Group for High Technology (MIGHT) is looking to use blockchain in three of the country's largest industries: renewable energy, palm oil industry, and Islamic finance.

By putting energy on the blockchain, sellers would have to declare how their electricity is generated, giving consumers the choice to buy electricity directly from their preferred source.

This would spur competition and encourage faster adoption of renewable energy. Private solar panel owners would also be able to sell any excess electricity – wasting less electrical energy as compared to distributing electric power over long distances from power stations.

In agriculture, palm oil is Malaysia's biggest export, accounting for nearly half (43.1%) of the country's agricultural income, according to official figures.

With such high stakes, putting produce and its certifications on the blockchain will allow for a more sustainable supply chain, as all participants can track the source of palm oil and monitor the transactions.

Government bodies can also use the data to track the sources and regulate the industry for a more sustainable approach.

There is also an interesting proposition for the Islamic banking sector. Under the Syariah law, it is forbidden to collect interest and any debt created must be backed by material goods such as gold.

Conventional banks on the other hand tend to rely on intangible assets such as futures. This results in complex processes that require multiple party contracts and comes with higher legal and administrative costs.

Blockchain can help mitigate these costs while allowing banks to remain compliant to Islamic laws.

For example, banks can develop smart contracts that are automatically executed and enforced on the blockchain. This will prevent tampering and ensure transparency.

More importantly, of course, would be competition from rival businesses, or partners for that matter. As more and more organisations realize the urgency of starting on the digital transformation journey, you wouldn't want to be left behind.

Not only do companies have to think about digital natives – start-ups and businesses born in the cloud – they have to take into account established businesses proactively transforming into digital businesses, modernising their architectures and embedding high levels of automation into their operations.

NEM: Educate, engage and encourage

For some, it may seem like a gargantuan task to consider blockchain technology. Where do you start? Which platform is best suited for my business?

The first thing to do is to clarify the confusion. To many, blockchain and bitcoin are one and the same, but they are not!

***Stephen Chia** is the Regional Head for NEM Southeast Asia as well as a council member of the NEM Foundation. More information on NEM can be found at NEM.io while information on the NEM Blockchain Centre can be found at nem.my.*

Bitcoin is just one example of how the blockchain platform can be used to attain the benefits.

People should think less about cryptocurrencies, and more about the various implementation possibilities of the technology.

With that out of the way, look for a platform that keeps its designs simple and functional.

Adopting a platform as such is far more suited to quick and easy integration with current enterprise-grade technology, than having to build from ground up.

Think of it as a plug-in system that can be built on top of current technologies to allow for integration with blockchain technology, in turn, allows the company using it to draw benefits from the inclusion of a blockchain-based system in their existing technological framework.

For example, this means the company's team of programmers can consider pretty much any programming language and are not restricted to a platform-specific language. It is highly customisable, and quick to deploy.

Security and privacy are never far off the list of considerations, so think of a platform that offers a degree of both security and privacy as far as use of assets and data is concerned.

Further, a multisignatory feature offers increased protection for transactions; it is designed as an on-chain multisig feature where again, it does not require a user to do any programming.

An on-chain multisig means whenever a transaction is signed by one party, it is broadcasted to the entire network. It sits there till it is signed by one or more parties, as defined by the multisig condition.

At NEM, we understand the pressure points for businesses. Our focus is getting adoption and real people using blockchain.

Like any other technology at the nascent stage, education and training is key.

That is why the NEM blockchain platform is tailored to help companies get into blockchain – from end to end.

We are committed to continuous education and engagement with the mainstream industries, governments and academia. It is now part of our programme to penetrate the markets globally.

The NEM Blockchain Centre (NBC) in Kuala Lumpur, Malaysia – the largest of its kind in the region – was opened for operation in July, serving as a blockchain learning centre, incubator and accelerator for organisations in Asia.

That's not all as we have also just recently opened a similar hub in various other locations worldwide.

These NEM hubs will play a huge role in helping businesses to build awareness and adoption of blockchain — if it's right for them.

The NEM blockchain is being adopted in a number of industries and services in Asia and around the world, including Appsolutely, one of the largest rewards and loyalty programme companies in the Philippines and a point-of-sale terminal for cryptocurrency for the retail industry (Pundi X) in Indonesia.

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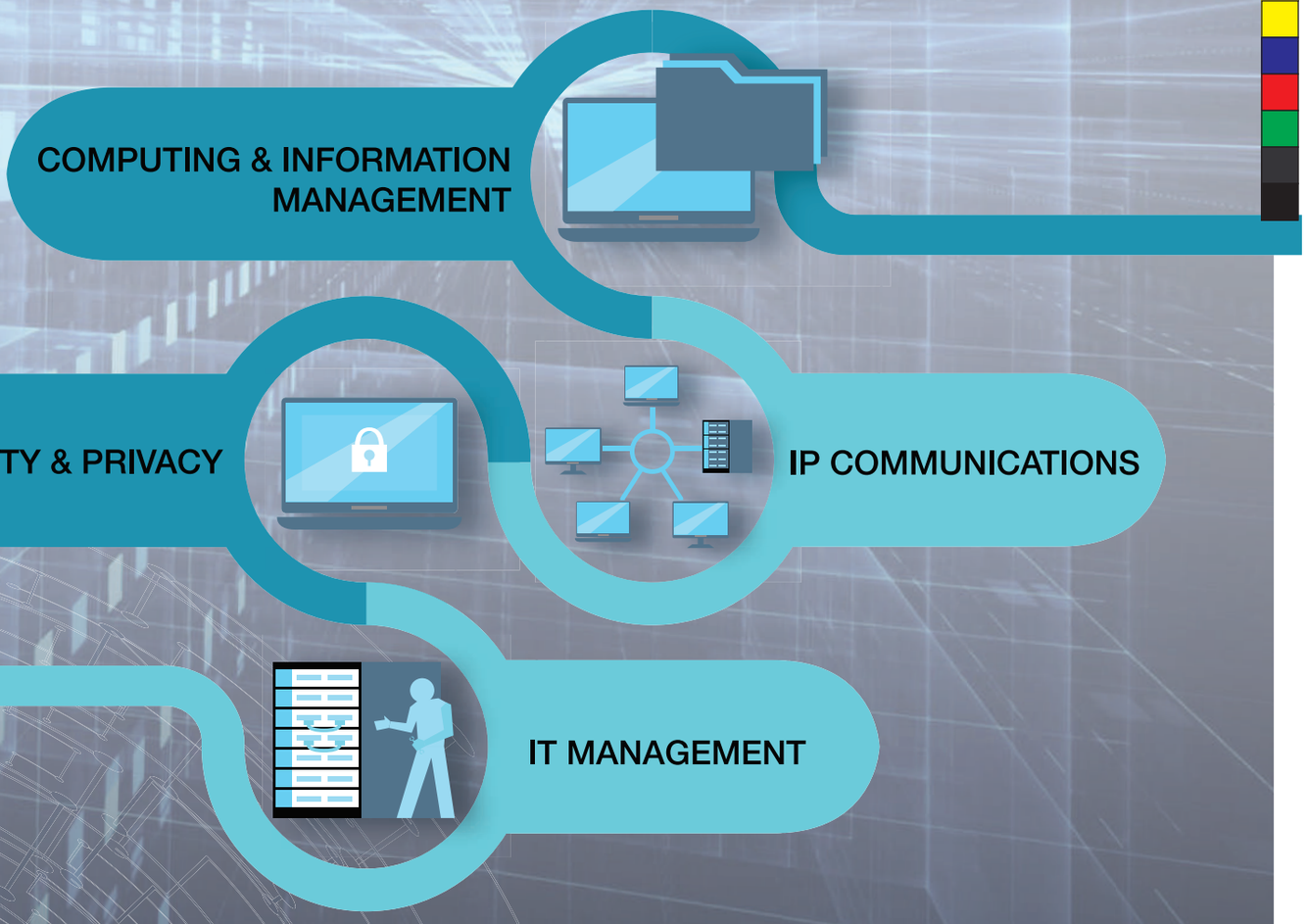

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CHAPTER 13:

Analysing blockchain's impact on talent management

By: Anthony Raja Devadoss,
Managing Director & Business Head,
PERSOLKELLY Consulting – APAC

The world went into a frenzy and everyone was losing their minds on the newest gold rush. Bitcoin prices were soaring to unprecedented heights and investors were rushing in to get their hands on this asset. Their values kept soaring through the years before reality check dawned upon us.

This was how blockchain was introduced to the world. While the technology is mostly associated with cryptocurrency, there is a lot more to blockchain than meets the eye. Before the bitcoin rush, blockchains were already a known technology in the business world, with its potential to transform work as we know it.

Why Blockchain in HR?

As the market moves towards short-term contracts over long-term assurance, millions more are applying for the same job. While digitisation has made things easier, it is not a replacement for human interaction.

Organisations still need human insight. For example, someone might be faking their entire resume, something extremely hard to detect for grassroots organisations. Moreover, workers may have multiple skills which can be hard to fathom. They may be evolving even now, learning new skills through online courses. It becomes hard to keep track of everything happening in the freelance market.

As the core workforce keeps expanding, it will only get harder to keep track of everyone's credentials, let alone verify them. The corporate world needs technology that is reliable and secure. Something that can be trusted to verify the candidates, their skills and organisations. This would exponentially

improve the system of screening candidates and diminish the time taken by recruiters and managers.

Blockchain may be the answer to all these problems.

How might Blockchain impact your HR?

Just like bitcoins which tracks a new transaction as it occurs, blockchain can help HRs and company heads keep track of new candidates or employees in the whole organisation. When anyone sends a packet of data across the network, the data will be verified by everyone with permission. When adding new data to the system, the new block needs to be verified by each node in the system.

A blockchain system is encrypted and can only be accessed by certain individuals inside the corporation. These individuals have a digital ID which in turn is verified by blockchain before giving access. Each node inside the network must have the same information stored which every other node agrees to.

Integration of blockchain tech in a company removes the hassle of manually verifying data and managing a large number of people. There is no way to tamper with the information as there are thousands, if not millions, of blocks that need to be edited to cause any significant data breach.

A blockchain is secure because even the smallest change is copied through every block in the network. Anyone trying to cheat the system is identified immediately. A block cannot be deleted or edited. You can only add information and if some data doesn't match the other blocks, the information is rejected.

As the core workforce keeps expanding, it will only get harder to keep track of everyone's credentials, let alone verify them. The corporate world needs technology that is reliable and secure.

A personal ID from a blockchain is totally secure and can be used in many ways, from signing legal documents to verifying employment or experience.

Who is using Blockchain?

Blockchain technology in companies is not very far away from reality. There are already companies that are trying to explore the potential of blockchain. Recently, Recruit Technologies announced a partnership with Ascribe to create a blockchain network aimed at automating resume authentication. Other companies have been touted to join this new race soon.

A better corporate system

Blockchain has developed a unique reputation as a secure system with confusing technology. However, bitcoin tech is getting familiar with every passing day. Blockchain will soon be sought to replace primitive sorting systems and even take over legal services.

Already commissioned to take over recruitment and HR roles, we can soon look forward to a future where keeping records, such as retail and medical, manually is consigned to history.

SPECIAL **FEATURE**

SPECIAL FEATURE:

What does the future hold for digital tax in Malaysia?

By Laurence Todd
Director of Research and Development,
Institute for Democracy and Economic Affairs
(IDEAS)

The issue of whether and how to introduce further taxes in the digital economy is a topic of much debate around the world, and Malaysia is no exception.

When tabling the Mid-Term Review of the 11th Malaysian Plan in October 2018, the government confirmed it was exploring the imposition of a new tax in the digital economy. But what is the justification for a new tax? And what are the options and their potential impact?

At a global level, popular concern has centred on whether large, digital multinational corporations (MNCs) are paying enough tax.

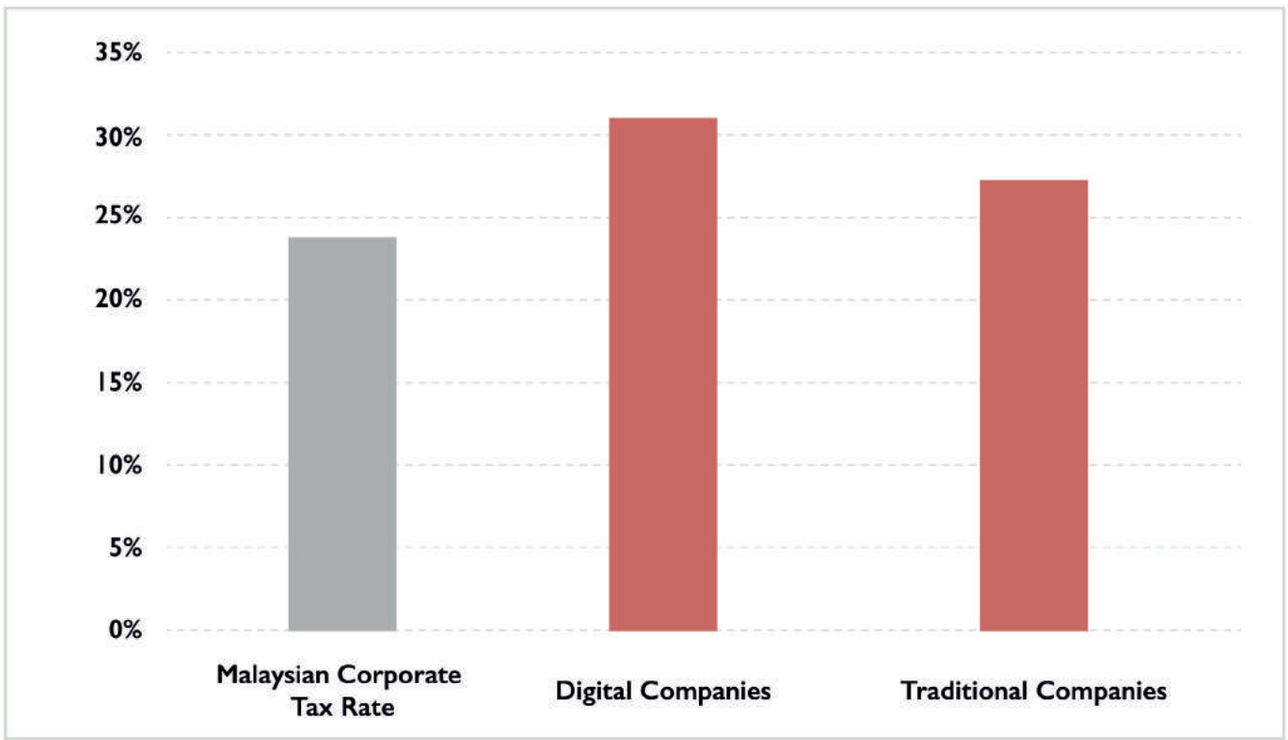
In part, these concerns prompted the Organisation for Economic Cooperation and Development (OECD)-led work on Base Erosion and Profit Shifting. This initiative has a significant effect on the way companies operate globally.

Research by the European Centre for International Political Economy (ECIPE) concluded that the effective tax rates of digital MNCs were the same if not higher than traditional brick-and-mortar companies.

At a recent Roundtable hosted by IDEAS on this topic attended by industry, academia and the government, there was agreement that overall tax take of digital companies is fair. Instead, the issue is where the tax is paid.

Many of the largest best-known companies pay the bulk of the tax in the US, where their assets and IPs are based.

But some countries are arguing that more tax should be paid in the countries where digital goods and services are consumed, not just where they are developed.



Tax Rates across traditional and digital companies (ECIPE, 2018)

This runs against the long-standing principle of taxation - namely that direct tax is paid where the value is generated.

The OECD is currently considering this issue and plans to report in 2020. Ultimately, this issue can only be settled by a global consensus; that is, it's not a disagreement between countries and industry about how much tax should be paid, but rather, a disagreement between countries and other countries about who the tax should be paid to.

Despite this, some countries are moving ahead regardless, with unilateral measures to impose additional direct taxes. These new taxes come in a variety of shapes and sizes.

Some countries are looking to redefine taxable presence based on new digital factors, such as user base. Other countries are looking at taxes on turnover, in other words, based on total revenue. Others are looking at taxes specifically designed to deter aggressive tax planning, such as the Diverted Profit Tax in Australia.

It is still early days for many of these new measures and the challenge will be whether these taxes can be implemented without creating an instance of double taxation which would be subject to legal challenge.

If Malaysia were to adopt this approach it would enter into a very challenging legal and political situation.

The options above all relate to new direct taxes. The other option being considered by many countries is to expand the scope of indirect taxes like Goods and Services Tax (GST) or Value Added Tax (VAT) to cover foreign supplied digital goods and services.

This is a less contentious issue globally: whereas there is disagreement over where the value of digital services is generated, it is clear where the consumption takes place.

Whatever form the tax takes, the costs of digital goods and services will likely increase.

It would also level the playing field between foreign firms and domestic firms providing digital goods and services who are already subject to consumption taxes.

In recognition of that, the OECD has issued guidelines on applying GST/VAT to foreign supplied digital goods and services, which a number of countries are now adopting.

In Malaysia, the Royal Malaysian Customs Department under the previous government announced its intention to amend GST so that it captured digital imports. At the time, Deloitte estimated the move would increase GST revenue by 5% to 10%.

Following the General Election, the new government abolished the GST and has replaced it with the previous Sales and Services Tax (SST), which would slightly complicate any further expansion to cover cross-border online transactions. But it could be done.

So it seems like new indirect taxation of the digital economy through reform of SST is a safer option for the Malaysian government, but what about the economic impact of introducing a new tax? Whatever form the tax takes, the costs of digital goods and services will likely increase.

In the case of any new direct tax, firms supplying digital goods and services to Malaysia will treat any new tax as an additional cost, and they will address this either by reducing operating costs and investment, reducing returns to shareholders or increasing prices.

Given that many digital goods and services are supplied in multiple countries, it is unlikely that firms would look to reduce operating costs in response to increased tax in any one country. Therefore, firms are likely to increase prices and reduce investment in response to additional taxes, at least to cover some portion of the additional cost.

As a consequence, the price of digital goods and services to the end user will likely increase.

Consumers' use of the internet is high in Malaysia. A survey by the Malaysian Communications and Multimedia Commission (MCMC) found that of the 32 million people in Malaysia, 24.5 million (76.9%) have access to the internet.

Of these, 70% use the internet to stream or download digital video and 49% use the internet for online shopping.

Any increase in prices for these goods and services would therefore be felt by a large number of consumers.

Firms could also respond to increased costs by reducing investment in goods and services tailored to the Malaysian market, lowering the overall quality of the products available to Malaysian consumers.

The costs of using digital platforms will increase for Malaysian businesses, impacting productivity and trade.

This is important, as access to digital platforms has been shown to increase the productivity of firms. A study by the World Bank found that the more intensively a company uses the Internet, the greater the productivity gains.

Increased internet usage is also associated with increased value and diversity of products being sold. A report by the US Congressional Research Service noted that: "The Internet, and cloud services specifically, has been called the great equalizer, since it allows small companies access to the same information and the same computing power as large firms using a flexible, scalable, and on-demand model."

Access to these services can help Malaysian companies to grow and compete in the global marketplace.

Social media platforms have been found to be beneficial in this respect too. In their paper on 'The factors influencing the use of social media by SMEs and its performance outcomes', Ainin et al. find that: "Facebook usage has a strong positive impact on financial performance of SMEs; similarly, it was also found that Facebook usage positively impacts the non-financial performance of SMEs in terms of cost reduction on marketing and customer service, improved customer relations and improved information accessibility."

Access to digital platforms is also important to Malaysian businesses - and particularly SMEs - looking to export their goods and services.

For many of these companies, access to international e-commerce platforms is essential. A study of US SMEs that utilise the e-commerce platform eBay found that 97% export.

Facebook's Future of Business Survey Report found that online tools play a role in SMEs' ability to trade internationally and grow.

"SMEs attribute growth - in revenue, resources, and employees - to their use of online tools to trade internationally. More than half of exporting SMEs (54%) report that more than 75% of their international sales depend on online tools and 65% of exporters agree that using online tools for selling internationally has increased their revenue."

The Digital Free Trade Zone (DFTZ) was specifically set up to improve Malaysian SME exports by onboarding SMEs to global e-commerce marketplaces and it is working: Malaysia was among the fastest-growing exporters to China on the cross-border platform of Alibaba, Tmall Global, in 2017.

There may also be fiscal implications to a digital tax. Given the productivity benefits of digital technology, the increase in business costs and a reduction in investment resulting from an increase in taxation will likely have a negative impact on the growth of the overall economy.

This means that the tax base would be reduced from where it would otherwise have grown to. It is therefore possible that a digital tax would have a nett negative impact on the overall tax revenue.

The issues noted above also emerge if the government pursues an indirect tax approach.

Consumers' use of the internet is high in Malaysia. A survey by the Malaysian Communications and Multimedia Commission (MCMC) found that of the 32 million people in Malaysia, 24.5 million (76.9%) have access to the internet.

However, the added problem with a new direct tax is that it is likely to encourage other countries to follow suit.

This would mean the costs for Malaysian businesses exporting digital goods and services to those markets will increase. As we noted above, these additional costs will likely result in higher prices, making those Malaysian businesses less competitive in overseas markets.

The decrease in competitiveness from higher prices will be particularly harmful in the case of taxes based on revenue.

As noted above, some of the unilateral measures being considered include taxes on gross revenue rather than profit.

If these are adopted in Malaysia's export markets, they will be detrimental to Malaysian SMEs which are often loss-making in the early years of development.

Twitter recorded its first profits for 12 years in February this year; if it had been subject to additional turnover taxes, it might not have survived.

A survey by RAM Holdings Bhd estimated that 28% of Malaysian SMEs are operating in the red, compared to 13% for larger corporations.

In other words, these taxes could act as a significant barrier to entry for new firms, which support incumbents, reduces competition and ultimately worsens the outcome for consumers.

Therefore, the government should clarify its intentions regarding a new digital tax.

A new direct tax is likely to create a whole host of legal and political issues, in addition to significant economic costs.

Increasing indirect taxation instead, through the expansion of the SST scope would be the less controversial course of action.

However, it would still involve higher costs and that impact would need to be considered carefully against the need to raise greater revenue.

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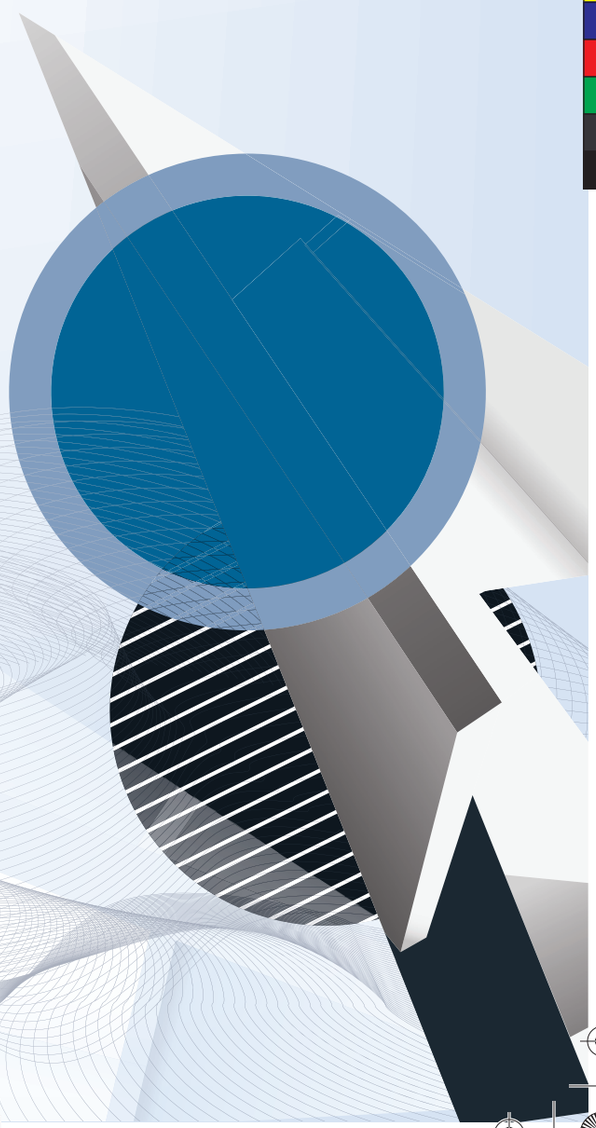

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PIKOM, the National ICT Association of Malaysia, is a not-for-profit organisation. It is the largest association representing information and communications technology (ICT) players in Malaysia. Since its inception in 1986, PIKOM has come of age as 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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