

REINVENTING LEADERSHIP IN THE DIGITAL AGE





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

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FOREWORD BY THE MINISTER OF COMMUNICATION & MULTIMEDIA



Y.B. SENATOR DATUK SERI PANGLIMA DR. MOHD SALLEH TUN SAID KERUAK

The Ministry of Communication & Multimedia (MCMM) is once again delighted to be a partner in PIKOM's effort to produce the seventh edition of its ICT Strategic Review Series for 2015/2016. I would like to take this opportunity to pay tribute to PIKOM's determined endeavour to publish such a research-oriented publication consecutively over the years. I am given to understand that the publication series has been appreciated and well-received by the industry throughout its course.

The current theme, "Reinventing Leadership in the Digital Age" is not only relevant, but also timely. Our nation as well as the rest of the world is undergoing economic and political adjustments attributed to digital 'disruptions'. The challenge is to constantly adapt and indeed, capitalise on the shifting parameters of the technological landscape, which increasingly require dramatic business transformation through reinvention or innovation.

At MCMM, we understand that today's business leaders are compelled to rethink in a profound and systematic manner how their companies have to be 'reinvented' in order for them to remain relevant and competitive. After all, business continuity, especially in the services sector, is imperative for Malaysia to reach the envisaged goal of becoming a developed nation by 2020. Indeed, the Government is committed to work closely and collaboratively with both the industry and academia to reap the full benefits arising from new age opportunities.

On that note, I congratulate PIKOM once again for this effort and I assure you that MCMM will continue to support such thought leadership publications as the ICT Strategic Review.

Y.B. SENATOR DATUK SERI PANGLIMA DR. MOHD SALLEH TUN SAID KERUAK

MESSAGE BY PIKOM CHAIRMAN



CHEAH KOK HOONG

After a stellar performance in 2014, the year 2015 has been episodic for Malaysia. Our economic projections have been dashed due to the plummeting Ringgit, drastic decline in global oil prices, falling commodity prices, record high debt servicing ratio, softening of the Chinese economy, the Greek financial crisis and political upheaval. Needless to say, all these internal and external factors are adversely impacting on trade, investment and cross-border capital flow.

Given the degree of openness of the Malaysian society and economy, the country has been experiencing more information and talent flow, besides a freer flow of goods and services. Due to the diversified structure of our economy supported by strong macro-economic fundamentals, the country is projected to remain on a steady growth trajectory (albeit at a lower gradient), mainly driven by domestic demand. On this score, we believe the information communications technology services (ICTS) sector will continue to register double digit growth of 14.2% in 2015, and subsequently 14.8% in 2016.

Despite challenging times, I am proud to note once again the successful completion of the ICT Strategic Review 2015/16 publication, the seventh of this series. This year's theme "Reinventing Leadership in the Digital Age" is both apt and timely. It is likely to draw the attention of both mainstream policy makers and industry players including academia for the simple reason that digital age competitors are disrupting virtually all industries. No company is immune. Tech innovation has been continuous, manifesting itself in various shapes and shades, whether through reinvention or outright innovation. More importantly, access to powerful digital technologies shatters barriers to entry, demanding even more dramatic business transformation. But, the challenge remains on awareness and readiness to embrace the changes and translate them into superb execution. It is our hope that a publication such as the PIKOM ICT Strategic Review 2015/2016 can not only provide valuable insights, but also provoke us to understand these changes that are upon us now. Perhaps with such understanding and awareness, we can be encouraged to embrace these 'disruptions' in a more positive manner and exhibit the kind of leadership that is congruent and aligned to the digital age (of opportunities).

We trust that you will find the articles in this year's series to be interesting, relevant, and thought-provoking; and more importantly, impactful to you.

I would like to take this opportunity to thank the Ministry of Communication and Multimedia (MCMM), particularly YB Senator Datuk Seri Panglima Dr Mohd Salleh Tun Said Keruak for his support of PIKOM and its activities.

Executive Summary

REINVENTING LEADERSHIP IN THE DIGITAL AGE



WOON TAI HAI PIKOM Research Committee Chairman

The ICT Strategic Review 2015/16 is the seventh publication in the series and this year's report focuses on Reinventing Leadership in the Digital Age. With a multi-dimensional perspective, we present here a wide spectrum of articles that identify key developments in information and communication technologies (ICT), with a special focus on leadership in the digital age.

Industry players, mainstream policy makers, development practitioners and members of the academia have put forward their thoughts, review, and opinion in the following chapters with regards to how the digital environment is progressing and advancing as it plays an increasingly significant role today. We would like to express our sincere appreciation to all contributors in ensuring the success of this publication once again. Some of our contributors have been supporting PIKOM's research endeavour since the first publication in 2009 and their openness and willingness to share their experiences and exposure have brought much benefits.

We are already experiencing how technology trends, talent development dimensions, business models, elements of good governance and public sector reforms are playing an integral part in driving the Malaysian ICT industry and the economy forward. It would be an understatement to say that ICT has effectively become a primary impetus of Malaysia's development which is gravitating more and more towards technology and knowledge-driven endeavours. The aspirations and vision of the nation also hinge on this platform in our bid to catapult the nation to fully-developed status in the not too distant future.

As we talk about leadership, we are also cognizant of the fact that this word has different shades of meaning and interpretations. It could simply mean the traditional traits of leading, guiding and motivating people to completing a task effectively, or it could be seen from a broader perspective such as leadership in an industry, sector, service, product or even an idea. No matter the nuances and varying perception, leadership equates to achieving goals and realising outcomes. Industries and companies are also fast becoming aware that legacy leadership characteristics may not be adequate in today's era. A critical look at reinventing leadership is imperative to encounter the fast onslaught of the digital age; and the question of whether the traditional leadership style is still relevant is perhaps of utmost importance. Today's leaders may not have the choice but to seriously rethink and strategise as to how their businesses and companies can remain competitive and relevant as we move into the future. Hence the theme of this publication "Reinventing Leadership in the Digital Age".

Peter F. Drucker, a renowned management guru has outlined the need and the rationale for reinventing leadership in his many books. He likened the computer triggering the information revolution to the steam engine igniting the industrial revolution. However while the steam engine

was the initiating innovation, it was subsequently the railroads that truly brought about the revolution to the entire transport industry and rapidly broke geographical boundaries. Similarly, the computer has helped man to perform daily tasks faster, cheaper and more efficiently; but it was e-commerce and the internet that became the key to the information revolution and borderless communications.

Today, the information revolution with all its processes, data, knowledge, gadgets and applications that together make up the digital world, has become one of the key components in all facets of the ecosystems, be it business, economic, political or social. The advent of the internet and the countless digitalisation processes have certainly led to unprecedented changes in the way we work, play, learn and perform daily tasks, business or otherwise. It has also, of course, brought massive changes and disruption to the process of these evolution and revolution. The borderless features of today's business model not only brings new opportunities, but also heralds in new threats in various forms and shades, posing challenges to traditional societal values, cultures and lifestyle. This in turn, has led to a new phenomenon and in fact a whole new word and industry - "Cybersecurity". Cyber threats are not only technical in nature but are also in the form of content posted on the internet and social media sites that can be detrimental to individuals, organisations and even to countries. In recent years, more and more of such occurrences like the undermining of products and brands and the reputation of business organisations to erode customer confidence has been on the rise via cyber-attacks. Vulnerable open platforms, malware to track and steal information, threats to privacy, online espionage, spamming mails, data breaches, ransomware scams etc. are all part of the growing phenomena of cybersecurity and cybercrime.

Meanwhile, human resources and talent management are also now at a crossroads. The common issues encountered today include managing (younger mindsets), hiring and identifying talent globally, retaining the best talents and managing a flexible and virtual workforce. Technology can also be seen as a double-edged sword since it can be leveraged upon to transform human resources and manage talent development but at the same time it has also provided access to faster and sometimes unreliable information, often leading to hasty decisions among the workforce.

Under such a challenging scenario, the theme of this publication is perhaps timely but "Reinventing Leadership" (easier said than done) demands a strong sense of creativity and will power, and it must be translated into different and timely execution. While companies endeavour to reinvent themselves, many are also challenged by the financial requirements of the digital investment as well as the risks that come along with it. Hence, it is also imperative to bear in mind that some of these financial returns in particular in terms of cost savings will only be realised in the medium to long terms. However, the bigger returns can come in the form of creation of new markets, innovation breakthrough, regional and globalised reach, breaking the traditional barriers, achieving market leadership and potentially be positioned ahead of the curve. These are perhaps some of the ultimate "outcomes" to be sought after in assuring long-term sustainability and profitability for an enterprise, be it large or small.

What are some of the key areas of focus then, one may ask? Reinventing leadership can be in the context of increasing customer satisfaction, enhancing employee relations, building cross-border relations, securing institutional support, improvising security & mitigating risk, achieving sustainable quality with efficient processes, knowledge management, innovation, market globalisation and enhancing human capital (this is certainly not an exhaustive list). In essence, these are not new areas but very much the traditional building blocks of businesses; albeit the approach to managing these areas will need to be critically reviewed. Henceforth, the crucial question – How much do you need to "Reinvent your leadership in this Digital Age"? Towards this end, this publication has once again compiled a number of thought leadership articles centered on the theme; offering insights and strategic direction in addressing contemporary and newer issues and perhaps some thoughts on how to take your business to the next level.

CHAPTER I: THE MALAYSIAN ECONOMIC AND ICT OUTLOOK 2015/16 BY PIKOM

In 2015, the Malaysian economy lost its growth momentum due to a number of factors internally and externally. Internal factors included inflationary pressure exerted by the Goods and Services Tax (GST) that was implemented in April 2015; falling commodity prices for crude petroleum, palm oil and rubber; and political uncertainties perceived as affecting economic growth. External factors included the ringgit depreciation against major currencies worldwide from the last guarter of 2014; negative impact of the softening of the Chinese economy; devaluation of the Yuan; while strong US economic growth has affected external trade and investment. Taking cognizance of on-going economic and political setbacks, the international development banks and agencies like the World Bank, International Monetary Fund and Asian Development Bank have all lowered Malaysia's growth rate for 2015. Likewise, PIKOM has revised the growth rate to 4.9% for 2015 from its earlier projection of 5.0% growth. Nonetheless, the growth rate for 2016 is expected to reach 5.0%. Continuing positive growth is expected for 2016, fueled mainly by domestic demand, supported by a generally low inflation rate, low unemployment rate, favorable lending rates for businesses and household as well as investment loans. Meanwhile, the ICT outlook is projected to post double digit growth of 14.2% in 2015 and 14.8% in 2016. ICT Sector growth will primarily come from the intensification of digitalisation elements in the transformation and corridor projects. Nonetheless, the country's economic and ICT sector growths are challenged by currency woes, impact of indirect taxes, subsidy and fiscal deficit rationalization, workforce competency, employability of graduates and talent migration, in particular ICT professionals in search of better remuneration and career advancement.

CHAPTER 2: ASEAN ECONOMIC COMMUNITY: DIGITAL LEADERSHIP IN THE CONTEXT OF E-ASEAN

Chapter 2 focuses on the ASEAN Economic Community (AEC) and provides a perspective on digital leadership in the context of e-ASEAN. Since its formation in 1967, ASEAN has mainly focused on regional integration despite its diverse political, economic, social and cultural settings. In the face of the impact of new-age ICT technologies on the global economy, society and governance as well as the individual's lifestyle, ASEAN has moved up in its value proposition and in 1999, initiated the e-ASEAN Framework which was duly signed by the Governments of Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. The Framework at the ASEAN level is aimed at promoting cooperation to develop, strengthen and enhance competitiveness in the ICT Sector, reduce the digital divide, enhance public and private sector business partnerships, and promote the liberalization of trade in ICT products, ICT services and investments. Following this in 2007, ASEAN moved to the next level when its leaders adopted the ASEAN Economic Blueprint that served as the basis for the establishment of the ASEAN Economic Community 2015. The AEC envisages a single market and production base, a highly-competitive economic region, a region of equitable economic development, and a region fully-integrated into the global economy. In other words, ASEAN has been constantly reinventing its leadership towards freer movement of goods, services, investment, skilled labor, and a freer flow of capital and information. Indeed, past achievements in these aspirations are quite limited due to the vast differences not only politically and economically, but also technologically. Nonetheless, the paper proposes that in the current digital age, there is a need to reinvent its leadership so as to explore more concrete and doable initiatives such as an annual publication series, regular workshops, regional-level research, setting up of virtual malls and establishing ASEAN-level academies for capacity and capability building in digital knowledge and skills.

CHAPTER 3: LENDING A HUMAN TOUCH TO DIGITAL LEADERSHIP

Although digitization is considered a buzzword, the paper views it as a transformation of the way we live, respond, decide and create. On this pretext, the author from Leaderonomics has highlighted three broad shifting trends as a consequence of digitalization and three leadership principles that could carry us successfully into this era. The three consequences of digitization elucidated in the paper include digitization and leadership, the 3 shifting trends of digitization and the 3R's in lending a human touch. Pertinently, the paper has stressed that digitalization in an organization cannot simply be successful if we digitize only the human aspects. Instead, it has to be at the personal level with the quality and ability to exert influence over employees within the organization and externally with customers in the context of performing a transaction. The three shifting technology trends include 'enable', that is, breaking many traditional barriers and enabling connections at never-seen-before pace and capacity; automation where technology is replacing a whole or a portion of their organizational structure for the customer experience and the organization's succession plan; and analytics meaning data harvesting using various digital platforms and using business intelligence to treat customers better and improve organizational performance nuances. The 3R's in relation to human touch highlighted in this paper are respect how leaders interact in a digital organization such as face-to-face engagement, having empathy and bottom-up listening; reliability - viewing vulnerability, uncertainty, complexity and ambiguity (VUCA) in a digital environment; and redefining - leveraging on technology for better options and not the easier options including foresight to grow value beyond the organizational profits by truly embracing humanity. The paper has also made due references to the Malaysian experience, in particular, the Digital Malaysia national ICT initiative that entails thought leadership, political will, visionary thinking, and consistent communication of goals and plans.

CHAPTER 4: THE DIGITAL OVERHAUL: RETHINKING MANUFACTURING FOR THE DIGITAL AGE BY IBM

Interestingly, this chapter by IBM has highlighted the need to rethink or reinvent leadership in the manufacturing sector for various reasons. From the global manufacturing perspective, the paper has highlighted that manufacturing closer to their customer base now makes the most sense; the need to adapt manufacturing activities and rethink global value chains to reflect changes in operating costs; and conditions in traditional offshoring and production platforms. Many organizations are once again relocating their manufacturing and production operations due to rising labor costs in China and other emerging low-cost regions; high supply chain and logistics costs, and wide cost differentials around the world for electricity and natural gas. Industries more sensitive to transportation costs, such as consumer goods and appliances, are "near-shoring" - moving manufacturing to locations near or within their key markets. Manufacturing costs have also been affected due to rapid changes in wages, labor productivity, energy costs and exchange rates. Warranting attention are hidden costs pertaining to speed to market, greater agility, and increased ability to customize products and services for specific market segments as well as realigning to global sourcing networks and production footprints. Succinctly put, continued advances in areas like big data and analytics, cloud, the Internet of Things (IoT), robotics and additive manufacturing are ushering in new opportunities to drive efficiencies and optimize manufacturing - with tremendous implications for global value chains. Indeed, these technologies facilitate the elimination of labor, help make regionalization and localization more economical, and enable improved customer service and production efficiency at every level.

CHAPTER 5: LEADERSHIP IN NATIONAL ICT RD&C: A MIMOS PERSPECTIVE

Chapter 5 is by MIMOS Berhad, whose *raison d'être* is to support the domestic ICT industry to become more innovative and competitive by developing sound technologies for its use. By mandate, therefore, MIMOS is an enabler. In this regard, the paper has highlighted that MIMOS, through its R&D endeavor, enables the local ICT industry by championing four critical strategies that impact innovation. These include a) conducting market-oriented R&D; b) developing strategic technology platforms; c) generating, protecting and exploiting Intellectual Property (IP); and, d) energizing technology-focused innovation ecosystems. In enabling the industry to be more productive, MIMOS also indirectly enables other R&D partners in the country, viz. universities and research institutes, to realize the value of their research and technology development activities.

CHAPTER 6: CHANGE MANAGEMENT – COMPELLING BUSINESS CASE FOR CHANGE

This chapter on change management has given the context that irrespective of size, companies generally have a simple goal - progress and stability. A stable environment is critical for continuity and usual growth earnings for business stakeholders; prices stay in check; people stay in their jobs; and more importantly, life is good for the employers and employees. In reality however, the economy, businesses and markets are subject to various vulnerabilities and risks that at times blow comfortable scenarios to smithereens. The factors that affect stability include market transparency, labor mobility, global capital flows, political instability, and instantaneous communications. Under such circumstances, lost shareholder value, reputation and jobs for employees are inevitable, thus warranting attention on change management. This is not only imperative for businesses, but also for governments. There are numerous models in the market to address change management processes and associated tools and templates. However, this paper is confined to the Pritchett Change Management Methodology and has highlighted the importance of human capabilities, adaptiveness, and methodology. The Pritchett model, abbreviated as AD³S=Adapt, in essence entails five key processes - A for assess the imperative; D for define organization readiness actions; D for develop people readiness; D for deploy participants for implementation and S for sustain energy for gain and pay-off. For making a successful transition through change management requires leadership qualities and execution excellence. However, the transition can be considered successful if and only if adding value and sustainable results are fully realized as envisaged. Like in any other program, the implementation of change management requires the appropriate resource allocation and appropriation besides institutional and leadership support and commitment. Communication and learning are imperative to model implementation. Companies will reap the rewards only when change occurs at the level of the individual employee, and more importantly, a mindset shift is crucial and it must start from the top.

CHAPTER 7: SUSTAINABILITY LEADERSHIP BEGINS WITH THE PREVENTION OF GREENWASHING

This chapter begins by defining greenwash as "disinformation disseminated by an organization so as to present an environmentally-responsible public image" as per the Oxford English Dictionary; it connotes deception in promotion. By making due reference to the UK Guide to Greenwash, the author has brought forward 10 signs of greenwash based on international codes and research. They are: fluffy language; green products versus dirty companies; suggestive pictures; irrelevant claims; best in class; just not credible; gobbledygook; imaginary friends; no proof; and outright lying. The paper has cautioned that the escalating occurrence of greenwashing can have a deep negative effect on consumer confidence in green products, eroding the consumer market for green products and services; and negatively impinge on investor confidence in environment-friendly firms, eroding the socially-responsible investing capital market. The rising global tendency in greenwashing claims and the mounting demand for tighter government oversight have caused many countries around the world to mull over, develop and execute suitable regulatory procedures to battle this trend, especially through the ISO 14020 series that deals specifically with aspects of environmental labels and declarations.

CHAPTER 8: SMART GOVERNANCE TOWARDS CHANGING THE LANDSCAPE OF THE MALAYSIAN PUBLIC SECTOR

Chapter 8 has highlighted that the Government has been always reinventing public sector leadership in responding to a strong demand all over the world calling for governments to be more efficient and effective in their service delivery. The introduction of New Public Management (NPM) in the 1990s has been the catalyst for governments to innovate new strategies and programs to fulfill their aspirations in meeting the needs of the citizens. The use of Electronic Government (e-Government) has been one of the most successful inventions in the new millennium to improve the quality of government service delivery. The Malaysian government launched the e-Government Flagship in 1996 to reinvent the government with the aim to be more transparent and accountable in providing its services. The Government recently introduced its Government Transformation Programme (GTP) to complement the initiatives undertaken by e-Government projects. Both these projects are aimed at achieving the country's Vision 2020, i.e. making Malaysia a high-income developed nation. This paper seeks to explore the contents and success of both the projects while trying to establish "complementary link", i.e. smart governance between them towards changing the landscape of the country's public sector management. Set to continue its efforts during the Eleventh Malaysia Plan (2016-2020), the Government is committed to transforming the public service by becoming more citizencentric, rationalising public sector institutions for greater productivity and performance, strengthening talent management, enhancing project management capacity and capability, and capitalizing on local government for quality services at the local level. Specifically, to reform the public sector through digital technology leadership, the 11th plan has identified a number of specific technological directions and applications. These include proliferating open data among agencies; encouraging cross-agency data sharing; developing public sector cloud computing infrastructure; leveraging big data analytics; increasing usage of online services; maximizing the usage of Urban Transformation Centres, Rural Transformation Centres and Mobile Community Transformation Centre Services.

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PIKOM would also like acknowledge the invaluable contribution of all the authors for this series. Specifically, we would like to thank the Ministry of Communications and Multimedia and (MCMM), Leaderonomics, IBM Malaysia Sdn Bhd, MIMOS, Pritchett Malaysia, Green Data Centre LLP and Nottingham University Malaysia Campus, as well as many others who have spared the time and resources for the publication. We hope these key players in government, industry and academia will continue to lend their support for the future.

Lastly, PIKOM would like to register its sincere appreciation to the entire team in the PIKOM Secretariat for their individual support in the course of preparing this publication.

QUOTES:

"Change is the constant, the signal for rebirth, the egg of the phoenix" by Christina Baldwin

"Progress is a nice word. But change is its motivator and change has its enemies" by Robert F. Kennedy (1925 - 1968) .

CHAPTER 0I:

Malaysian Economic and ICT Industry Outlook For 2015/16

The National ICT Association of Malaysia (PIKOM)



INTRODUCTION

The Malaysian economy has been losing its growth momentum as a result of inflationary pressure from the implementation of the Goods & Services Tax (GST) in April 2015 and a weakening ringgit since the last quarter of 2014. Compounding this scenario has been the continuous capital outflow from our shores; threat of a default on Greek debts; continuing drop in commodity prices, in particular crude petroleum, palm oil and rubber; and increasingly negative perception of the country. Furthermore, being an open economy for trade and investment, the country's growth is also exposed to the softening of the Chinese economy including the devaluation of the Yuan and a strong US growth momentum.

Nonetheless, the government and some analysts are still confident that the favourable economic fundamentals here in terms of employment, inflation, business lending, household borrowing and trading are still strong. The popular sentiment is that there will be positive growth in 2015 and 2016 mainly driven by domestic demand. If compared with the economic downturn in 1997, the current financial infrastructure, in particular the banking system, is more robust, leading many to believe that Malaysia can weather the present economic storm.

Despite these economic setbacks and political challenges, leading international institutions such as the World Bank, International Monetary Fund (IMF) and Asian Development Bank (ADB) as well as PIKOM project positive economic growth for Malaysia in 2015 and 2016, albeit at a lower rate in 2015. The World Bank has cut its 2015 growth forecast for Malaysia's economy to 4.7% from an earlier estimate of 4.9% on expectations of slower export growth and investments in the oil and gas industry as well as moderate private consumption next year. Similarly, the IMF has maintained a growth rate of 4.8% for Malaysia in 2015, mainly on account of private investment in the non-oil sector and a boost to activities with its main trading partners like China, the US, India, ASEAN and East Asian countries. The ADB has forecasted a lower growth rate of 4.7% in 2015 for Malaysia as a result of the slump in prices for oil and other commodities. However, the ADB has projected a markedly higher 6.0% growth in 2016 on the expectation of robust growth in the Services Sector, in particular communications, tourism spurring the hotel and restaurant business, wholesale and retail trade, real estate and business services, a buoyant household spending and business expansion.

Taking into consideration the domestic demand, private and public consumption, and investment, real imports and exports, and the continuing political instability as well as prudent measures adopted in addressing on-going financial issues, PIKOM has lowered its projection of the Malaysian economy to 4.9% for 2015 and 5.0% for 2016; see Figure 1; earlier forecasts were 5.0% and 5.2% respectively, as reported by the ICT Job Market Outlook 2015 released in mid-year. As shown in Figure 1, growth forecasts for the third quarter is 4.5%, which is poised to trend upwards to 4.7% in the fourth quarter.



Figure 1: Quarterly GDP Growth Rates: Q12011 - Q42015 Data Source: Bank Negara Malaysia

I. SERVICES SECTOR MOMENTUM

The Services Sector has been positioned as the main source of growth in the bid to transform the Malaysian economy into becoming a high-income advanced nation by leveraging on the rapid pace of growth from the previous decade and accentuating this to the next level. In 2014, the Services Sector contributed 55.3% to the GDP and this is forecasted to reach 55.6% in 2015. As shown in Figure 2, the Services Sector, comprising electricity, gas and water, wholesale and retail trade, hotel and restaurants, transport, storage and communications, finance insurance, real estate and businesses as well as government services, has registered an average annual growth rate (AAGR) of 8.5% during the 2007-2015 period with its GDP value expanding from RM254.3 billion to RM487.9 billion. Under this tempo of growth, the Services Sector is poised to touch RM529.4 billion (representing 55.8% share of GDP) in 2016, and reach 58.0% by 2020 when the nation aspires to be a developed nation.

The Services Sector Blueprint announced by the Government in March 2015 has also identified ICT as one of the key drivers and enablers of the Services Sector transformation via strategies to impact human capital development, internalisation strategy, sector governance reform and investment incentives. This will also put the ICT Sector in the forefront of growth opportunities in line with the positive outlook for the industry for years to come.

If this growth momentum in the Services Sector can be sustained not only in the years ahead, but also beyond 2020; then it will certainly reduce the country's decade-long reliance on commodity-related sectors, which has often resulted in fluctuating growth dependent on global commodity prices.



Figure 2: Malaysian Services Sector GDP Growth: 2007-2016 Data Source: Bank Negara Malaysia and PIKOM's Estimate

2. DOMESTIC DEMAND

Over the years, domestic demand in Malaysia has been largely driven by private and public consumption expenditure through a private-public sector partnership strategy. The overall consumption expenditure expanded from RM302.6 billion in 2005 to RM746 billion in 2015, registering an AAGR of 11.0%. Under the current economic momentum, the consumption is poised to reach RM827.7 billion by 2016. Figure 3 shows the private and public consumption expenditure growth at 11.0% and 10.8% respectively. However, the share of private consumption expenditure has incrementally expanded from 79.4% in 2005 to 80.4% in 2016. To reduce the fiscal deficit, the Government's consumption expenditure has also been scaled back; registering only 3.6% growth in 2015. Maintaining an optimum balance between domestic consumption and the fiscal deficit is often a 'double-edged' sword; as any slowdown in efforts to boost domestic demand may also affect the economic growth of the country. Hence, it is crucial for an alternative revenue model like the Services Sector to be identified to drive the growth and increase the size of the economy.



Figure 3: Final Consumption Expenditure of Public and Private Sectors: 2005-2016 Data Source: Bank Negara Malaysia and PIKOM's Estimates

3. EXTERNAL DEMAND

The Malaysian tangible exports registered an AAGR of 5.0% with the value expanding from RM481.2 billion in 2004 to RM744.1 billion in 2015 after experiencing a dip in 2009 due to the Global Financial Crisis (refer to Figure 4). In tandem, the Malaysian tangible imports also registered positive average growth of 7.2% during the period 2004 to 2015. Prior to 2015, the trade balance was positive in favour of Malaysia. However, due to the plummeting Ringgit, the trade balance was negative in 2015, where the cost of imports exceeded the value of exports. The scenario of imports exceeding export value will continue to persist into 2016 under the current exchange rate situation. However, the weakened ringgit is also an opportunity for more of our goods to be exported and possibly neutralise the impact of the higher importation cost.



Figure 4: Malaysian Exports and Imports of Goods: 2004-2015 Data Source: Bank Negara Malaysia

3.1 DIRECTION OF TRADE

Malaysian Exports

Over the past decade, the direction of Malaysian exports has drastically changed. As shown in Figure 5, exports to the US and Canada region have declined significantly from 19.4% in 2004 to 8.8% in 2014 in line with trade expansion with other countries - with China from 6.7% to 12.1%; ASEAN from 24.8% to 27.4%; Oceanian region from 3.6% to 5.0%; and with India from 2.4% to 4.2%. However, as mentioned earlier, this can be a window of opportunity for our exporters to sell more goods and services to other countries; in particular to the US, which is facing an upward growth in their economy.



Figure 5: Direction of Malaysian Exports of Goods in 2004 and 2014 Data Source: Bank Negara Malaysia

Malaysian Imports

In tandem, the sources of imports have also shifted direction significantly. Share of imports from the US and Canada region dropped from 14.9% in 2004 to 8.1% in 2014; see Figure 6. During this period, imports from China, being our current major trading partner, increased from 9.8% to 16.9%; ASEAN 23.85% to 25.5%; Oceania region from 2.0% to 3.4%; and with India from 1.2% to 2.0%. This clearly shows a shift towards the East especially to the ASEAN region and it is envisaged such trade will continue to grow with the advent of ASEAN Economic Community (AEC).



Figure 6: Direction of Malaysian Imports of Goods in 2004 and 2014 Data Source: Bank Negara Malaysia

3.2 TRADE IN SERVICES

With the implementation of MSC Malaysia initiatives since the mid-nineties, followed by the promulgation of the Services Sector as the new engine of growth (as shown in Figure 7), the export services or credit to the country's current account expanded at an AAGR of 3.3% during the period 2004-2015. The import services or debit to the current account expanded significantly at an AAGR of 7.3% during this period. As can be seen in Figure 7, since 2011, the debit has exceeded the credit value, indicating that Malaysia is a net importer of services. With the weakening Ringgit, Malaysia's net trade-in services may not get any better.



Figure 7: Exports and Imports of Malaysian Services: 2004 - 2015 Data Source: Bank Negara Malaysia and PIKOM's Estimates

3.3 FOREIGN DIRECT INVESTMENT (FDI)

Figure 8 shows the flow of foreign direct investment in credit and debit terms respectively during the 2008-2015 periods. From the figure it is obvious that there was a kink in the trend in 2009 when the country's investment was plagued by the Global Financial Crisis. FDI credit grew significantly at an AAGR of 4.6% from RM89.3 billion in 2008 to RM122.1 billion in 2015, indicating that the country is very much FDI-dependent for its economic growth. The foreign investment of Malaysians also expanded significantly from RM65.3 billion to RM77.3 billion, but growing at a lower AAGR of 2.4%. Hence, the policy of the country must not only be conducive to foreign investors but must also provide an environment of stability and be free from natural disasters. It is pertinent to remember that the country's value proposition must not only be sound, but also sustainable over the long term.



Figure 8: Malaysian Foreign Direct Investment in Credit and Debit: 2008-2015 Data Source: Bank Negara Malaysia and PIKOM's Estimates

Figure 9 and Figure 10 show the direction of FDI in credit and debit terms respectively. In both credit and debit terms, the bulk of FDI dealings are from Europe, Northeast Asia and ASEAN. Five-year aggregated totals are used to iron out any fluctuation in investment trends.



Figure 9: Direction of Malaysian Foreign Direct Investment in Credit: 2010-2015



Figure 10: Direction of Malaysian Foreign Direct Investment in Debit: 2010-2015 Data Source: Bank Negara Malaysia

4. MACRO INDICATORS

Despite the weakening of the Malaysian Ringgit, the country's macro-economic fundamentals remain largely stable. This is attributed to the following:

4.I INFLATION

Inflation in 2015 is poised to hover at 2.5% from 3.1% in 2014 (refer to Figure 11). However in 2016, the inflation rate is expected to rise to 3.0% mainly due to higher importation costs arising from the weakening ringgit. The government's ongoing subsidy rationalisation efforts beginning in 2013 and the 6% Goods and Services Tax (GST) implemented in April 2015 continue to exert pressure on the inflation figures. Nonetheless, inflationary pressure is expected to remain subdued, helped in part by lower oil and gas prices. Generally, the inflation rate is expected to be hover in the 2.5% - 3.0% range.



Figure 11: Malaysian Annual Inflation Rate: 2010-2016 Data Source: Bank Negara Malaysia and PIKOM's Estimates

4.2 LENDING RATES

The ratio of outstanding national debt to GDP purchaser's value grew significantly from 54.5% in 2009 to 70.8% in 2015; it peaked at 74.0% in 2013; as reflected in Figure 12. The outstanding national loan expanded from RM388.3 billion to RM794.3 billion, registering an AAGR of 12.7% during the 2009-2015 period.

The ratio of housing loan debt to GDP also increased from 31.0% in 2009 to 40.9% in 2015 when the loan value expanded from RM221.3 billion to RM459.5 billion, having grown at an AAGR of 13.0%.



Figure 12: Outstanding National Debt and Housing Loan Ratio to GDP: 2009-2015 Data Source: Bank Negara Malaysia

In response to the rising household debt, Bank Negara Malaysia increased the OPR to 3.25% on 10 July, 2014. Prior to this, the OPR had been at 3.00% since May 2011. This led to an increase in the average lending rates from 4.59% in 2014 to 4.63% in 2015 for commercial banks and

6.13% in 2014 to 6.88% in 2015 for investment banks, thus making domestic investment costlier for both households and businesses; see Figure 13. However, the overall lending rates in the country are still favourable for investments.



Figure 13: Average Lending Rates of Commercial and Investment Banks: 2000-2015 Data Source: Bank Negara Malaysia

4.3 UNEMPLOYMENT RATE

As acknowledged, Malaysia has been experiencing a tight labor environment since the early nineties. As such, even after the Global Financial Crisis 2009, the unemployment rate only reached 3.6% in Q12010 and then 2.7% in Q32014 before going up to 3.1% in Q22015; see Figure 14. The key challenge is retaining and attracting talents back to the country to fill employment in specialist areas including the Services Sector.



Figure 14: Unemployment Rate in Malaysia: Q12010-Q22015 Data Source: Bank Negara Malaysia

4.4 FOREIGN EXCHANGE RATE

As shown in Figure 15, the value of the Malaysian Ringgit, particularly against the US dollar, weakened from RM3.157 in August 2014 to RM4.2518 in September 2015, registering a 27.1% drop in value. This will certainly affect the importation of goods and services, and in the long run, will have a ripple effect on the entire economy. Another pertinent issue is the uncertainty created by such fluctuation with the USD, as it is not known if the 'bottom' has been reached.



Figure 15: Foreign Exchange Rate, Malaysian Currency against USD: January 2014- September, 2015 Data Source: Bank Negara Malaysia

5. ICT INDUSTRY OUTLOOK

The ICT Industry outlook can be broadly grouped into two categories - ICT products (manufacturing) and ICT Services. As published in the ICT Satellite National Account by the Department of Statistics Malaysia (DOSM), the GDP value of ICT products, broadly constituting computers and peripheral equipment, communications equipment, consumer electronic equipment and miscellaneous ICT components and goods, dropped significantly from RM40.2 billion in 2005 to RM37.4 billion in 2014, registering a negative AAGR of -0.8%. However, the total ICT value increased from RM72.7 billion to RM115.9 billion with an AAGR of 5.3% during the 2005-2014 period. The positive growth is attributed to ICT Services, whose GDP share of the entire ICT Sector increased significantly from 44.7% to 67.7% during this period, indicating the growing importance of ICT Services industry in Malaysia.

Further examination showed that the hardware production component in the ICT Manufacturing Sector, in particular integrated circuits, semi-conductors and electronic transistors, has registered a significant decline in terms of production units. As shown in Figure 16, production of integrated circuits and semi-conductors registered a negative AAGR of -3.4% and -7.7% respectively during the period 2008-2015. The electronics transistors segment recorded a positive growth of 2.2%, which is considered very low in comparison to its performance during the early nineties.



Figure 16: Production Volume of ICT Hardware Segments in Malaysia: 2008-2015 Data Source: Bank Negara Malaysia

The performance of these three ICT manufacturing industries is well understood upon examining the five-year period since 1990, as shown in Figure 17. During the nineties, all the three ICT manufacturing segments registered significant growth and brought about significant earnings for the country through exports. But thereafter, the five-year growth rates plummeted when Malaysia began to lose its low-cost competitive edge to newly-liberalized economies in Asia, in particular China and Vietnam. Besides that, with the emergence of new digital technologies, the demand for these micro-electronics components also fell, leading to the closure of some of the plants.





On the other hand, as in the previous years, the ICT Services industry registered a double digit growth rate of 14.2% in 2015 when its value-added services expanded from RM62.1 billion in 2014 to RM70.9 billion in 2015; see Figure 18. The Malaysian economy on the other hand is expected to experience a dip in 2015, but is nevertheless projected to experience an upswing in 2016. Under this assumption, the ICT Services Sector is also poised to record another double digit growth estimated at 14.8% (RM81.4 billion). The share of ICT Services to GDP is also expected to increase from 3.3% in 2000 to 6.9% by 2016.

Given the current momentum, the overall outlook for the ICT market in 2015 and 2016 is expected to be positive, driven in particular by the ICT Services Sector barring any unforeseen global 'shocks' or major turmoil. The ICT hardware manufacturing sub-sector will continue its downward trend.



Figure 18: Overall ICT Services Value-Added and Share to GDP: 2000-2016 Data Source: Bank Negara Malaysia

The ICT Services components include telecommunications, entailing fixed and mobile telephony services, Internet access, satellite and data communication services; computer services comprising hardware and software wholesaling, retailing and consulting, programming as well as repair and maintenance activities; publishing activities entailing both traditional and online printing; motion picture, video and television programmes and information services activities such as data processing, hosting data while web portals are considered as content activities.

As can be seen from Figure 19, structurally, the share of telecommunications in the ICT Services industry is projected to decline from 65.2% in 2010 to 59.5% by 2016. In tandem, the content industry, entailing programming and broadcasting activities, significantly doubled its share from 3.8% to 7.6% over the six years. Share of computer services also expanded from 22.5% to 24.7% during the period. However, it is important to note that the overall size of the ICT services market is expected to double in 5 years from 2010 to 2016, from RM41.6B to RM81.4B with the largest sub-sector still dominated by Telecommunications and Computer Services.



Figure 19: ICT Services by Sub-Sector Breakdown: 2010 and 2016 Data Source: Bank Negara Malaysia

From a sector breakdown perspective, it can be seen that the share of exports of telecommunications, computer and information services to the overall exports services component have significantly expanded from 3.4% in 2005 (that is, RM2.38 billion out of RM69.08 billion) to 6.7% in 2015 (that is, RM8.97 billion out of RM132.23 billion); see Figure 20. In tandem, the share of imports of telecommunications, computer and information services to overall services imports also expanded from 3.4% (RM2.56 billion out of RM75.35 billion) to 7.5%, (RM11.17 billion out of RM148.92 billion). This is evident that the Services Sector (both export and import) within the ICT industry has indeed been enjoying growth by leaps and bounds. The challenge is "can we tip the scale and export more services than import services?"



Figure 20: Exports and Imports of Telecommunications, Computer and Information Services: 2005-2015 Data Source: Bank Negara Malaysia

5.1 FOREIGN DIRECT INVESTMENT IN INFORMATION & COMMUNICATION SERVICES

FDI in information and communication services grew by an AAGR of 14.4% with the investment expanding from RM19.70 billion in 2008 to RM50.64 billion in 2015, as shown in Figure 21.



Figure 21: Foreign Direct Investment (FDI) in Information and Communication Services: 2008-2015 Data Source: Bank Negara Malaysia It is interesting to note that in 2008, the share of FDI for information and communications services to the overall services sector was only 18.7% or RM19.7 billion of the total RM105.1 billion. This proportion is projected to constitute 21.8% by 2015, that is, RM50.6 billion of the total RM232.0 billion. FDI is still an important driver not only for the economy, but also the ICT industry as a whole as investments in the ICT industry can be huge and attract the 'knowhow' to boost the industry. It is therefore imperative that consistent and conducive policies in attracting FDI are put in place and these policies must be flexible enough to adapt to the dynamism of the global conditions.

CONCLUSION

In concluding, these are some key factors that can impact on the economy and industry and it is imperative that priorities must be given to mitigating these impacts.

Currency Woes

The continuing weakening of the Ringgit value will impact groups of people differently and depending on whether the suppliers are dependent on the importation of goods and services. For domestic producers, wherein the services and materials are mostly acquired locally, any direct impact to their costs and bottom line will be minimal. However, if these goods and services are from overseas, in particular if they are priced in USD, Pound and/or Euro, then they can be adversely affected in terms of the increased selling price, margin erosion and even loss of revenue due to cancellation of orders. Hence, it is important that these suppliers seek alternatives including using hedging financial instruments to mitigate the exchange risks and also to source from countries (including locally where possible) where the currency exchange rate is perhaps not as unfavourable as compared to the USD. Further, it may be advisable to reduce the time lag between an order (contract signed) taken and delivery of goods to the customers to mitigate the risks of exchange rate fluctuations.

On the other hand, local exporters will probably benefit from a weaker currency especially if their goods and services are priced in USD, since their local cost of production is still the same but the selling price (in ringgit terms) will increase. The demand from abroad may also increase if they price their products strategically.

While the weakening Ringgit is a major cause for concern for most people, it is perhaps the instability of the currency against the USD that has compounded the overall impact on the economy and business. Not knowing if it has hit 'rock bottom' means decisions cannot be made readily and the tendency to adopt a 'wait and see' posture is certainly not conducive to the productivity of the country.

While some may argue that a weaker ringgit may boost local tourism, but a large portion of our goods and services are also imported and this will still have a flow-on effect on consumers who will have lesser purchasing power.

Impact of Indirect Taxes

The GST implemented in April 2015 is essentially aimed at broadening the tax base and increasing taxation revenues by increasing the number of payees; it is often known as an indirect tax. Alternative means of taxation is urgently required to offset the national external debt which has significantly risen in recent years. Currently, only 14% of the working population pay income tax (direct taxation). Under the sales and service tax (SST) regime, there is also a disadvantage of a time lag in collecting them. However, under the GST system, all consumers are now compelled to pay based on consumption and the collection of these taxes is either on a monthly or quarterly basis. Many have also argued that this form of tax is regressive and will impact the poorer echelon of the population.

Since it is at the early stages of implementation, there are still some teething problems, in particular the readiness of SMEs to comply with the system; a lack of understanding on items that are tax-exempted and zero rated; difficulties faced in assigning tax code for each item in terms of cost incurred and complexities faced in GST-related accounting software; and higher costs passed down by suppliers to those companies with revenue under RM500,000 which are not compelled to register.

It is expected that overall consumption will actually reduce in the months after the implementation, impacting the third and fourth quarters of 2015. Nevertheless, GST implementation is inevitable and as experienced by other economies which have implemented such consumption tax, it will take some time before the economy stabilises and consumption resumes.

Subsidy Rationalisation

Subsidy rationalisation via the floating of petrol prices in the market may help to reduce the Government's burden. However, a hike in petrol prices is likely to result in the rising cost of living which would make many, in particular those in the lower rung of society and those starting careers, to tighten their belts.

Being a petroleum-producing country, the Government's revenue is linked directly to world oil prices and this certainly poses challenges in reducing the fiscal deficit since the country relies heavily on such income. Falling commodity prices are not only confined to crude oil, but also oil palm and rubber, becoming a "double-whammy" for the nation.

Competent Workforce

Despite its dynamism, the nation is still facing a number of persistent challenges pertaining to having a competent and quality workforce. Some of the common contributing factors cited include a short supply of skilled ICT graduates from Institutes of Higher Learning (IHL); quality of graduates who are not able to meet industry demand; and lack of professional recognition and accreditation for ICT disciplines. All these can certainly impact the ICT industry in the long term.

In response to some of these challenges, many IHLs are already reviewing their curriculum and are also engaging with industry experts to come up with a curriculum relevant to the industry. Associations like PIKOM will continue to promote specialist and certification programmes including working closely with ministries and agencies to ensure a continuous competent workforce for the industry.

Talent Migration ("brain-drain")

With the weakening currency, talent migration across borders is likely to pick up especially to Middle Eastern destinations. When the rate was at RM3.66 against the USD, countries like Kuwait, Saudi Arabia, United Arab Emirates (UAE), Bahrain and Qatar were already paying at least 1.75 time higher for ICT professionals in comparison to their counterparts in Malaysia. (Source: ICT Job Market Outlook in Malaysia, June 2015 - PIKOM). With the exchange rate at RM4.23 against the USD, the multiplication factor rises to 2.04 times, (taking into account purchasing power parity), thus giving more impetus for cross-border job relocation.

This problem can potentially be accentuated once ASEAN 2015 takes effect, enabling a greater flow of goods, services and people across borders. The local ICT industry will certainly face a talent retention problem when ICT graduates and experienced professionals are compelled to search for greener pastures to take advantage of the weak currency.

While salary may not be the only motivator, it is important to note that the salary gap between fresh graduates and more senior positions is widening; and comparatively they are also earning less than their counterparts in other countries such as Australia and UK. On the positive side, ICT salary will continue to grow in the years ahead due to the demand in the industry; and this is expected to increase by 7.4% in 2015 over 2014. (Source: ICT Job Market Outlook in Malaysia, June 2015 - PIKOM).

As a measure to mitigate this "brain-drain", a critical review of the overall remuneration for local ICT workers is perhaps a good starting point.

CHAPTER 02:

ASEAN Economic Community: Digital Leadership in the Content of e-ASEAN

The National ICT Association of Malaysia (PIKOM), Malaysia



INTRODUCTION

With some farsightedness, five foreign ministers met officially on August 8, 1967 in Bangkok, Thailand to discuss the possibility of setting up a regional economic bloc. Looking back, these senior government officials representing Indonesia, Malaysia, the Philippines, Singapore and Thailand would be amazed at how far this inter-governmental organisation has advanced, moving from its political formation towards regional integration. The Association of Southeast Asian Nations (or ASEAN), as it became known, was established after the founding fathers inked the ASEAN Declaration. They were foreign ministers: Adam Malik of Indonesia, Narciso R. Ramos of the Philippines, Tun Abdul Razak of Malaysia, S. Rajaratnam of Singapore, and Thanat Khoman of Thailand. Brunei subsequently joined as the sixth founding member on January 7, 1984.

After nearly five decades, ASEAN is now at a crossroads in terms of politics, culture and socio economy. Given this scenario wherein the digital age has also led to a greater flow of goods, services, talents and information as well as networking opportunities, irrespective of geography, time, traditions and cultures, it is certainly timely to re-examine and perhaps reinvent leadership so that it can be more versatile in assimilating and driving such dynamism across the region.

However, ASEAN member countries are at different levels of digital experience and maturity; besides the traditional disparity measured in terms of GDP, trade imbalance, investment flow, standard and the quality of life. For example, Malaysia has shifted its focus to the 'Innovation Divide', (which has become the main ICT thrust since the 10th Malaysia Plan and is now ushering into the 11th Plan), whereas in the case of the less developed ASEAN nations, the focus may still be on the 'Digital Divide'. The disparity in digital leadership in this region has necessitated the need for "re-inventing leadership" in the digital era, and unless this is done, the existing digital divide will make it difficult for the ASEAN Economic Community (AEC) to achieve its objectives collectively. Just as there are ample of opportunities in the digital era, it can also be major stumbling blocks in particular to a free flow of goods and services in the region.

The United Nations International Telecommunication Union (ITU) appropriately describes this predicament as the "Information Society Gap in ASEAN". A framework for an e-ASEAN agreement signed during the ASEAN Informal Summit in Singapore in November 2000 was intended to narrow the digital divide and enhance living standards of ASEAN nationals through information and communication technologies (ICT), with a view of enhancing economic cooperation across the wide digital divide between member nations. We have seen various union and regional partnerships that are continuing to impact the countries and nations, whether economically and/or politically. The European Union (EU), for example, when it came into being in 1951, comprised only six nations, but today, it has extended to 28 countries. While there are still ongoing challenges, the member nations have been able to complement and leverage on each other's strengths in order to compete with the rest of the world. Along with the EU, there is also the Transatlantic Economic Council (TEC), which promotes economic cooperation between the United States and the EU. Coming on much later is the Asia-Pacific Economic Cooperation (APEC), which was formed in 1989. It currently boasts a total of 21 Pacific Rim member economies that promote free trade across the Asia-Pacific region.

When four nations - namely Myanmar, Vietnam, Cambodia and Lao PDR - were accepted into ASEAN, the challenge for member countries was to leverage on each other's strengths in order to achieve common economic success as a regional bloc. The mindsets of the governments
also have to change to be in line with the changes in times as the world enters the digital era with agility being the buzzword these days. Hence, governments and regulators must play an important role in promoting and leading their nation to be competitive, agile and adopt an open-market mindset by crafting effective policies and regulations, in particular for telecommunications, cybersecurity, promoting a level-playing field market conducive to the prevailing environment.



Stages of economic integration around the World (each country coloured according to the most integrated form that it participates with):

- Economic and Monetary Union (CSME/EC\$, EU/€)
- Economic union (CSME, EU, EEU/EAEU)
- Customs and Monetary Union (CEMAC/franc, UEMOA/franc)
- Common market (EEA, EFTA, CES)
- Customs union (CAN, CUBKR, EAC, EUCU, MERCOSUR, SACU)
- Multilateral Free Trade Area (AFTA, CEFTA, CISFTA, COMESA, GAFTA, GCC, NAFTA, SAFTA, SICA)

e-ASEAN FRAMEWORK AGREEMENT

At the Third ASEAN Informal Summit of November 1999, a decision was made to establish a free trade area for goods, services and investments for the info-communications industries under a new e-ASEAN Agreement. Essentially, the Governments of Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam were involved in the formulating of the e-ASEAN Framework and endorsement on the November 24, 2000 in Singapore.

The objectives of the e-ASEAN Framework are to promote cooperation to develop, strengthen and enhance the competitiveness of the ICT sector in ASEAN; promote cooperation to reduce the digital divide within individual ASEAN Member States and among ASEAN Member States; promote cooperation between the public and private sectors in realising e-ASEAN; and promote the liberalisation of trade in ICT products, ICT services and investments to support the e-ASEAN initiative.

Since then, ASEAN has come of age and unfortunately little has been achieved in these past 15 years due to various reasons including differences in political aspirations and the ongoing vast digital gap.

ASEAN ECONOMIC COMMUNITY AND AEC BUSINESS ADVISORY COUNCIL

The ASEAN leaders adopted the ASEAN Economic Blueprint at the 13th ASEAN Summit on November 20, 2007 in Singapore to serve as a coherent master plan to guide the establishment of the ASEAN Economic Community 2015. AEC envisages the following key characteristics: (a) a single market and production base, (b) a highly competitive economic region, (c) a region of equitable economic development, and (d) a region fully integrated into the global economy.

The AEC areas of cooperation include human resources development and capacity building; recognition of professional qualifications; closer consultation on macroeconomic and financial policies; trade financing measures; enhanced infrastructure and communications connectivity; development of electronic transactions through e-ASEAN; integrating industries across the region to promote regional sourcing; and enhancing private sector involvement for the building of the AEC. In short, the AEC will transform ASEAN into a region with free movement of goods, services, investment, skilled labour, and freer flow of capital. While the desired outcome is certainly well defined here, a key ingredient for the success of such implementation was not obvious i.e. what areas of leadership would it entail to drive this plan?

DISPARITY IN GDP GROWTH AMONG ASEAN MEMBERS

The more established ASEAN member countries are growing their GDP at an average of 5.0%, but the new entries such as Cambodia, Laos and Myanmar are developing at a much higher pace of between 7.0% and 8.0% and this is expected as there have the opportunity to leapfrog. The other member countries can also leverage on this new growth by jointly investing in ICT-related areas. This is perhaps one way to reduce the digital divide and at the same time open up new markets.

Country	2011	2012	2013	2014	2015	2016
Brunei	3.4	0.9	-1.7	5.3	3.6	3.4
Cambodia	7.1	7.3	7.4	7.2	7.3	7.3
Indonesia	6.5	6.3	5.9	5.2	5.5	5.8
Laos	8.0	7.9	8.0	7.4	7.2	7.7
Myanmar	5.9	7.3	8.3	8.5	8.5	8.3
Malaysia	5.2	5.6	4.7	5.9	4.9	5.0
Philippines	3.7	6.8	7.2	6.2	6.3	6.0
Singapore	6.1	2.5	3.9	3.0	3.0	3.0
Thailand	0.1	6.5	2.9	1.0	4.6	4.4
Vietnam	6.2	5.3	5.4	5.5	5.6	5.7

Gross Domestic Product (GDP) Growth Rates at Constant Prices of ASEAN Countries, 2011-2016 Source: www.economywatch.com It was decided during the 12th ASEAN Summit that ASEAN member countries would affirm their strong commitment to accelerate the establishment of an ASEAN Community by 2015. By 2015, ASEAN would be a single market (currently with 625 million people) and production base with free movement of goods and services, skilled labour and both investment and freer flow of capital. It is hoped that with this commitment made in January 2007, the ASEAN Community will become a highly competitive economic region enjoying equitable economic development, and become fully integrated into the global economy by 2020.

This year is also significant for Malaysia as chair of the ASEAN Community. There are three integral pillars, namely the ASEAN Economic Community (AEC), ASEAN Security Community and the ASEAN Socio-Cultural Community that will enable the region to achieve its Vision 2020. The ASEAN-Business Advisory Committee of Malaysia (ASEAN-BAC) under the purview of the Ministry of International Trade and Industry (MITI) could play a significant role in spearheading the envisaged e-ASEAN initiative. The areas of cooperation within the AEC, which starts in 2015, include: human resources development and capacity building; recognition of professional qualifications; closer consultation on macroeconomic and financial policies; trade financing measures; enhanced infrastructure and communications connectivity; development of electronic transactions through e-ASEAN; integrating industries across the region to promote regional sourcing; and enhancing private sector involvement for the building of the AEC.

DISPARITY IN THE CURRENT STATE OF THE DIGITAL AND INFORMATION SOCIETY IN ASEAN

Region	2005	2010	2014
Africa	2%	10%	19%
Americas	36%	49%	65%
Arab States	8%	26%	41%
Asia Pacific	9%	23%	32%
Commonwealth of Independent States	10%	34%	56%
Europe	46%	67%	75%

Internet users by region

Source: International Telecommunication Union (ITU)

Infrastructure: The digital divide and comparison between ICT performance within and across countries can be measured using the ICT Development Index (IDI), published by the ITU. Based on a scale of 0 - 10, it is a composite index based on eleven internationally-agreed ICT indicators used by governments, operators, development agencies, researchers and others as a benchmark on the level of ICT development in a country. These indicators can be categorised into three sub-indices or clusters known as *Access, Use* and *Skills*.



Source: International Telecommunication Union (ITU)

By Access, we look at ICT readiness measured against fixed-telephone subscriptions; mobilecellular telephone subscriptions; international Internet bandwidth per Internet user; households with a computer, and households with Internet access. The *Use* sub-index measures the ICT intensity in terms of the Internet; fixed (wired)-broadband subscriptions, and wirelessbroadband subscriptions, while the Skills sub-index measures the ICT capability or skills, which focuses on adult literacy, gross secondary enrolment and gross tertiary enrolment.





Source: ITU

Based on the ITU report in 2014, there is still a wide digital gap between Singapore which has an IDI of 7.90 compared to Myanmar with an IDI of only 1.80. Singapore is well ahead of the other nine ASEAN member nations, ranking among the top 25 on the global IDI and in the fifth placing in a list of seven top ICT champions in Asia (in the order of Korea, Hong Kong, Japan, Australia, Singapore, New Zealand and Macau). Although Brunei (IDI 5.43) and Malaysia (IDI 5.20) are second and third to Singapore within the context of the ASEAN region, nonetheless these two nations are still lagging behind Macau (IDI, 7.66). In Asia, Singapore is ranked fifth, while Cambodia (IDI 2.61), Lao PDR (IDI 2.35) and Myanmar (IDI 1.80) are among the lowest. This clearly shows the huge gap in both the digital and technical agility within the ASEAN Economic Community and for any partnership or regional cooperation to truly take place, the gap has to be first closed.

Generally, ASEAN scores low on the IDI, efforts to keep up with the rest of the world have to be stepped up especially in the CLMV countries (Cambodia, Laos PDR, Myanmar and Vietnam). In 2013, Denmark scored the highest IDI of 8.86, followed by South Korea with 8.85. Although Thailand has moved ten notches up from the 91st position in 2012 to 81st position in 2013, Malaysia's ranking dropped to the 70th position in 2013 from 64th position in the previous year. This is an indication that a number of countries around the world are catching up fast in the adoption of ICT and unless Malaysia and other ASEAN countries adopt an aggressive approach to introduce ICT to its people, the region will be left behind in the much talked-about era of business agility.

A similar scenario can be painted about wireless-broadband penetration in Asia and the Pacific Region for years 2012 and 2013, with Macau and Singapore right at the top, while the rest of the ASEAN member nations are still tailing from afar. Thailand has shown a dramatic increase between 2012 and 2013, whereas Indonesia, Philippines, Malaysia, Vietnam, Cambodia and Brunei are inching forward slowly. Myanmar has seen near to zero increase in wireless-broadband penetration within the ASEAN Economic Council.

In most parts of Asia, including the AEC, affordability is still a major consideration. It remains the biggest barrier to Internet access for home use in many developing countries. Affordability is measured using prices in Purchasing Power Parity (or PPP\$) which is the price that the Internet Service Provider sets for the service. The PPP takes into consideration the living costs and currency fluctuations to determine (a) affordability to the infrastructure (for fixed line, broadband and mobile) (b) device affordability (computer and mobile phone) and (c) communication cost (post-paid and pre-paid, Internet subscription).

Based on the same ITU report in 2014, Philippines, Brunei and Malaysia are still high on PPP\$ for both fixed-line and mobile cellular phone services, compared to Singapore and Vietnam, which means that there will always be a higher entry level for fixed (wired) broadband and mobile broadband services in these countries. To increase broadband penetration, most of these countries would have to first reduce the prices of their broadband services significantly in order to achieve a higher penetration.

Diffusion of ICT products and services: Analysing further the IDI, one of the major contributions to Singapore's high IDI is its Access Index of 8.61 which is on one end of the digital divide, while Myanmar's Access Index of 1.72 is on the other end. While it can be argued that Access is relative to total population, geographical spread and general affordability, it is also a question of governmental decisions and willingness to invite major investors to invest in the ICT infrastructure. A country like China, with over 1.3 billion in population spread out over approximately 9.5 million square kilometres, recognises the importance of broadband as a "strategic public infrastructure for China's economic and social development in the new age." This is despite China already having a relatively high fixed broadband penetration of 14%, which is above the global average of 9%. In 2014, China Mobile announced that it would enter the fixed-line market, and this will see an even higher penetration rate in the former Communist country. Countries like Korea has already reached a 38% fixed-broadband penetration, which is one of the highest recorded worldwide, while others including Hong Kong, New Zealand, Macau, Singapore and Australia are already having high levels of between 25% and 30% fixed broadband penetration. There is no reason why the CLMV countries cannot follow the examples of China or Korea.

A way forward for these CLMV countries is to adopt mobile broadband. Within the last one decade, cellular mobile broadband has seen a big jump from a mere 4% of the world population in 2007 to 32% in 2014, equivalent to an 8-fold increase within just a period of seven years. Growth in Fixed Broadband, which requires huge capital investment in the laying of cables, is nearly stagnant in both developed and developing nations. The trend now is mobility which will provide ubiquitous and pervasive use of the Internet, and this is supported by the introduction of miniaturised and user-friendly mobile devices. The only challenge or barrier to this phenomenon, however, is the costs involved.

	2007	2010	2014
World population	6.6 billion	6.9 billion	7.2 billion
Fixed broadband	5%	8%	10%
Developing world	2%	4%	6%
Developed world	18%	24%	27%
Mobile broadband	4%	11%	32%
Developing world	1%	4%	21%
Developed world	19%	43%	84%

Worldwide Broadband Subscriptions



Wireless-broadband penetration, Asia and the Pacific, 2012 and 2013

Note: Macao (China) penetration of 303 per cent by end 2013 and 289 per cent by end 2012 Source: ITU





Source: International Telecommunication Union (ITU)

Human capital: Closely related to each other are the other two clusters: the *Use* Index and *Skills* Index. Until and unless the average population in ASEAN member countries are taught how to use and leverage on the Internet, the uptake of ICT in the conduct of business will continue to be low. Again, based on these two sub-indices published by the ITU, understandably, Singapore is well ahead of the other ASEAN member nations, while Myanmar, Cambodia and Lao PDR are lagging far behind. Malaysia and Thailand, which are second and third in the ASEAN ranking for *Use* Index, has only reached half the *Use* Index of Singapore, while Internet adoption and use in Myanmar is almost non-existent.



More developed member countries such as Singapore should encourage and promote the transfer of ICT capability through skills transfer to countries such as Myanmar, Lao PDR and Cambodia. Over time with integration of people, services and products, the ASEAN Economic Community could potentially become a common marketplace for these ICT products and services both for the private and government sectors.



BUSINESS AGILITY IN THE CONTEXT OF e-ASEAN

When Gartner's Nexus of Forces (social networking, mobility, cloud and big data analytics), a concept that has become increasingly being talked about as the future 'reality to come', eventually merge, the ASEAN Economic Community will inevitably face new business models and challenges. Entry barriers into the region will be less, which in turn, will spur an increase in competition within and outside the region.

Less than a decade ago, most companies were contented with a website, but a survey done in November 2009 and August 2010 showed a big increase in the number of commercial organisations keen to deploy, or planning to deploy, mobile applications on smartphones. Based on the research by VDC Research, the rapid increase in mobile workforce which exceeded one billion in 2010 is indicative of what the world will be like in a matter of years or even months. Globally, mobile employees (as a percentage of total employees) in large organisations have increased from 11% to 17%, while for the mid-sized organisations, the increase has gone up from 28% to 37%. It is anticipated that these numbers will continue to grow.



Source: VDC Research

Within the last ten years, the region has also witnessed a phenomenal growth in mobile business or m-Business. New business opportunities have emerged as a result of the convergence of electronic business with wireless technology. In short, business can be conducted round the clock from anywhere around the world in order to meet the informational and transactional demands of the end users. Process and technology bottlenecks will hopefully be a thing in the past, leading to increase in customer satisfaction, revenues and productivity. Eventually, the cost of doing business will be reduced substantially, compared to the traditional business processes.

Because of the need for better mobility, the ICT landscape in ASEAN is also expected to change, with devices becoming miniaturised and taking the shape of wearable technology. More and more myriad devices will also be introduced and inter-connected to each other with the proliferation of the Internet-of-Things (IOT) and these will not be confined to computer, tablets and mobile phones.

e-ASEAN – A DIGITAL LEADERSHIP FRAMEWORK TO TRANSFORM THE REGION

The establishment of e-ASEAN, therefore, has to be given priority as we usher the era of business agility. Under e-ASEAN, there are five flagships, namely:

- Establishment of ASEAN Information Infrastructure (AII)
- Growth of electronic commerce
- Liberalisation and facilitation of trade and investments in ICT products and services
- Capacity building and e-Society
- e-Government

In each of these areas, there is a task group established, each with a 'shepherd' and 'coshepherd.' In the case of establishment of AII, for example, the Philippines, assisted by Singapore, will be involved in enhancing intra-ASEAN connectivity, developing recommendations for the "least connected" ASEAN members, developing convergence principles and engaging with global Internet policy formulation. This is an important initiative that will enable containment of Internet flow within ASEAN through using peering technology where countries can leverage on exiting national networks; hence, reducing the cost of the Internet traffic, which currently flows through the United States. This will also be able to provide greater security for electronic transactions. To achieve this, it requires cooperation of all ASEAN member nations.

Singapore, along with Malaysia and Brunei, are spearheading e-Commerce in the region by developing a common e-Commerce legal framework for the AEC, providing consumer protection, establishing regional electronic payment system, protecting intellectual property rights, cybercrime legislation and prevention, developing authentication and security policies; and taxation issues. The presence of both CIMB and Maybank in different parts of ASEAN will certainly provide great opportunities for Malaysia to help spearhead mobile banking and e-Commerce in the region.

Meanwhile, both Indonesia and Singapore are involved in the trade liberalisation and facilitation for ICT goods, services and investments within the region, which among others will focus on harmonizing tariff nomenclature and customs valuation for ICT products. Under this initiative, Indonesia and Singapore will also be monitoring the latest development in the Asia-Pacific Economic Council and World Trade Organisation, before recommending them for implementation in ASEAN.

To help in capacity building and e-Society, Thailand will be working alongside the other four CLMV countries to provide SMEs with training and education, help to spearhead regional human resource development initiatives, development of common ICT professional standards and community-based e-centres.

In the area of public delivery services, Malaysia, a pioneer in e-Government, will help to facilitate inter-government cooperation and freer flow of goods, information and people and help introduce e-government services and applications such as e-Passport, e-taxation, e-democracy and online in governance and making processes more accessible for citizens and businesses in member countries.

There are also other areas of collaboration that e-ASEAN is working alongside other economic regions. For example, e-ASEAN + 3 is a joint agreement signed with China, Japan and Korea in 1999 on East Asia Cooperation, where the objectives are to encourage technical cooperation in information technology and e-commerce. This includes the development of an Asia e-Learning, East Asia Special Cooperation Initiative and Seminar on ASEAN-China ICT. E-ASEAN has also looked into collaborating with Australia and New Zealand under the ASEAN-CER. With the Asia Pacific Telecommunity, e-ASEAN is looking at addressing its capacity building and exploring other possible areas of cooperation.

Science and Technology development - In order for members of ASEAN community to compete effectively, it has to focus on innovation, research and development, commercialization and protection of its Intellectual Property. The member countries can no longer depend on technologies that are "imported" from the more advanced countries. New ideas will have to be developed and released into the market. But, for any innovation to be worth commercialising,

there needs to be a market size big enough to achieve good returns. No single country can sustain the viability of an innovation when commercialized, but ASEAN's market size is big enough for the new ICT product or innovation to gain traction. There needs to be a framework within the eASEAN for innovations to be introduced to the market, such as the legal framework under eASEAN for the protection of intellectual property currently being spearheaded by Singapore.

As a country, Malaysia is currently involved in a number of macro research and development (R&D) projects. The journey from as early as the 7th Malaysia Plan (1996-2000) has seen many more initiatives being adopted for innovative projects that can help bridge the digital divide, opportunity divide, application divide, the innovation divide. The latest under the 11th Malaysia Plan, the focus is on digital opportunity such as miniaturization of devices (and wearable technology), cloud computing, cognizant computing, big data analytics, e-commerce (and M-commerce), and the millennial generation (or Gen-Y).

Malaysia's ICT Roadmap 2012 charted the emerging

MACRO R&D THRUSTS



Source : MOSTI and PIKOM

ICT-LED INNOVATION THRUST



Source: EPU & PIKOM

Two other trends that are coming to e-ASEAN are in the area of Communications and Networking, and Green Computing (or Green IT). In the former, it is about online connectivity and real time interactivity elements in communications, networking and business transactions, where data can be accessed from anywhere in the world; while the latter is about designs that take into consideration the environmental challenges in the design and manufacture of computers, servers and other computer peripherals, to minimize carbon footprint. There is also a need to recycle rare metals in ICT products. Imagine that a tonne of gold ore yields only 5g of gold, but a tonne of used mobile phones (which contains no less than 20 rare metals) yields a staggering 400g of gold. At the same time, data centers have to be designed to minimize their energy consumption and GHG emissions. This is crucial because they are among the fastest growing parts of the ICT industry. Green Future Networks (GFNs) are network systems designs which tackle energy saving and embrace the challenge to reduce the environmental impact of future networks.

While Malaysia has developed its Green ICT policy and programme thrust pertaining to infrastructure, behavioural and energy efficiency, most of the other ASEAN members lack coherent strategy and have yet to adopt the green initiative. Pertinently, the e-ASEAN initiative under the infrastructure dimensions can explore smart systems and designs in buildings and manufacturing; under behavioral dimensions ASEAN members can work together in implementing carbon accounting practices, building virtualization and tele-working models and electronic waste disposals; and under energy efficiency dimensions collaboration may explore data centres and electronic devices development. Developing appropriate business models and partnerships warrant due attention in all aspects.

WAY FORWARD: MALAYSIA'S CONTRIBUTION TO e-ASEAN

As the chair of the ASEAN Economic Community in 2015, Malaysia plays an important role in championing the development of eA-SEAN, especially in the information communications technology areas that it has the core strengths such as the formulation of ICT policies and programme strategies, MSC Malaysia programme, e-Government, ICT investments, grants and loans for innovation, R&D, commercialisation, patenting and development of ICT talents.

Instead of competing in a "red ocean" for a small market of 30 million, companies providing broadband and mobile services should start venturing into CLMV countries, either through joint ventures or forming other forms of partnerships with local companies. At the same time, some of the local innovations can find their new markets in the other ASEAN countries. For e-Commerce or mobile commerce (m-commerce) to thrive, Malaysian companies have to think in terms of regional markets instead of depending on the Malaysian market alone. The Government through the Multimedia Development Corporation (MDeC) can, and should provide digital leadership in research and development, innovations and pioneer IT incubator projects, in one or two CLMV countries that it can adopt. More Malaysian banks should follow the footsteps of CIMB and Maybank in becoming regional players and offering Internet banking.

Besides addressing low hanging fruits, ASEAN Governments with the support of private sector partnership and regional and global industry associations (such as PIKOM, ASOCIO, APIA, WITSA), as well as with the support of international development organizations (like World Bank, International Monetary Fund, Asian Development Bank) can kick start several key initiatives to promote e-ASEAN. For example:

- ASEAN Digital Review a series of publications featuring the latest update of information and knowledge sharing that can be published online and accessible to the ICT personnel throughout the region;
- Annual ASEAN Digital workshops that can be held in ASEAN cities on rotation basis;
- ASEAN Digital Research there is a need to establish a regional funding mechanism for research on soft factors impact of contemporary ICT on economy, society, governance and individual life style;
- ASEAN Digital Virtual Mall buy and sell ICT products and services online which is uniquely an intra-ASEAN site;
- ASEAN Digital Academy to provide capacity and capability programmes either online or via tertiary institutions that are already established. Scholarships to be provided by ASEAN to encourage young people from the CLMV countries to undertake studies in the field of ICT.

In 2016, Lao PDR will assume the role of ASEAN Chair but it is imperative that the initiatives and programmes are continuously carried forward to achieve the congruent goals set out to form an ASEAN bloc, in particular the e-ASEAN programmes in aligning the respective digital states and reducing the digital gaps between the most and least-developed economies.

CHAPTER 03:

Lending a Human Touch to Digital Leadership

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INTRODUCTION

Digitalisation is the "buzzword" of our generation, and would be so in the near future. Being in an interesting time where we are at the tipping point between realization of the effects of digitalization and actually being digitally transformed leaves us with a the narrow chute of opening to delve into what it means to be a leader in such a digital era. More importantly, there are various ways to approach the understanding of digital leadership but the purpose of this article is to look at three broad shifting trends as a consequence of digitalization and three leadership principles that could carry us successfully into this era. We also look at the growth of ICT in Malaysia and draw from cultural dimensions to understand how human leadership of the digital era in our country would look like.

PART I: DIGITALISATION & LEADERSHIP

Digitalisation is a broad word that can be defined in many ways but its core message is about the adoption of technology into different areas of our life. Often confused with the term "digitization" which is defined by the conversion of analog values into discrete values, digitalization goes beyond this simple conversion – it is a transformation of the way we live, respond, decide and create. It also means it involves more complicated aspects of our human being, and digitalization in an organisation cannot simply be successful if we digitize the human aspects. While leadership can also be defined in many broad aspects, in this particular article we are scoping it to mean a person or a role that has influence over people and within the organisational context whereby there is some form of transaction that goes on internally with employees and externally with customers.



Industry digitization index 2012

Figure 1: This figure illustrates the different industries that are transformed digitally. Source: PWC The 2012 industry digitization index

PART 2: THE 3 SHIFTING TRENDS OF DIGITALISATION

Various research efforts by top consulting organisations, and opinions of thought leaders have pointed to the increased permeation of digitalisation in changing the core of how organisations function. To cover these shifting trends, we look at three key trends that have resulted as a consequence of digitalisation; namely Enabler, Automation and Analytics.

Enabler

Undeniably, the use of technology has broken many traditional barriers and enabled connections at never-before-seen pace and capacity. This has thus led to the enabling of new organisational business models while disrupting current models, change in dynamics of relationships and allowing space for new exponential growth.

We have been so used to the strategy models of 1950's, in the era of Management Theory X and Y, when industrialisation was thriving. Inevitably, this has led to strategies that are based on the certain, the stable and the predictable. However, as we may have noticed in recent years, these technological disruptions have led to the foundations of such strategy to be shaken. For example, 20 years ago, if we would like to understand deeper about a subject, we would rely on the encyclopedia or a subject matter expert of whom may not be easily reached. Fast-forward now, we are almost always taking out our smartphones to access the thousands, if not millions of web search returns on Google just for one specific question. This means that the data and content that are often held dearly by organisations as part of their IP no longer solely belongs to them. Philip Evans, who is a fellow of consulting company BCG notes that revolution in digitalisation and technology has contributed to the growth of many small organisational networks, some owned just by a single person who becomes part of a bigger production chain. Thus, that leaves the traditional organisational strategy and business model vulnerable to new entrants who can disrupt their business at various stages of the value and production chain. Organisations may have to change their strategy to include these small-time competitors who hold strong production power due to the availability of technology in order to continue competing in the market. Back to using Google as an example, we see acquisitions of what were smaller startups such as Instagram and Nest at exorbitant prices in order to continue ensuring their presence in the future market. In our own experience working with talents from a multinational distribution organisation, even the concept of creating an online distribution channel resulted in internal conflicts as this may mean cannibalisation of their current physical distribution channels.

On top of that, Evans has also suggested that digitalisation would result in organisational and business structures that are horizontal instead of vertical. We no longer see Supplier A providing to Supplier B to supply Vendor C who sells to Vendor D and reaches Organisation E. We now have Organisation A curating from Organisation B, C, D, E and so forth. In Malaysia, a current trend is the rise of personal concierge services available to masses and these were once only accessible to the elites. This changes the dynamics of how organisations build their business model not only in considering their future strategy, but also how they interact with stakeholders who are now at the same level of decision-making with them. An acquisition gone sour will reflect on the character of the leader who is in charge of the acquisition and because the organisations are so intrinsically connected now, that reputation of leaders are more likely to spread as quick as wildfire.

Within the organisation itself, we see strategy and business model including IT/technology as a consideration; however, we also note that there is a difference in the extent of such adoption

in the organisational strategic plans. For some organisations, IT/technology still remains a cost that has undecided returns on the organisation's future while other organisations have built their strategy to include an IT architecture. For many Chief Information Officers (CIO), this has been an uphill struggle particularly to change the mindset of stakeholders to see technology as an influencing factor of the organisation's competitive advantage beyond just another cost on the budget. So those who have been fortunate enough to take the position of a CIO will need to look for their human touch and live up to their concept of user experience in architecting the technology with the strategy of the organisation. It also means that technology is no longer one tactic of the strategy but it is of value add to the entire strategy because it includes people in its architecture.

Option	Description	Example	Benefits	Value
 Use digital technology to enhance traditional business models 	Use automated and digital services to compete with and extend existing manual services	 eBay auction model Life insurance computing algorithms Dell/Amazon - dynamic pricing 	 Make better use of self-service channels including customer service through social media 	 Reduced cost to serve Reduced time to revenue
	Shift the core business model from selling products towards offering services	 IBM Streetcar/Zipcar 	 'Pay as you go' model extension 	 Increased share of value-chain and share of wallet
	Transform hardware offerings into service offerings	 Xerox/HP offering 'Managed Print Services' Apple/Amazon integration of product with ongoing service (iTunes) 	 Integrating products with services engenders combined loyalty Longer-term relationship with customer 	 Increased annuity revenue streams from services Increased customer lifetime value
2. Transform existing business models digitally	Offer entirely new services that cannot be provided manually	 Google/Yahoo - online search capability Skype - VoIP Salesforce.com - software-as- a-service Facebook/LinkedIn - social media marketplaces 	 Volume of potential customers using the often free service 	 Shareholder and reputational value
	Offer existing services through new digital channels	 100flowers - purchase through Facebook Tesco - purchase through smartphone app Dell - customer service through Twitter 	 Customer convenience engenders loyalty 	 Increased revenue streams Reduced cost to serve
3. Invent entirely new business models or different engagement models		 Virtual currency used in online games and social networks Google/Yahoo - Advertising revenue linked to search Facebook - sell digital customer data giffgaff - a 'people-powered' mobile operator business model 	 First to market Fast to market through digital channels High customer loyalty and low cost to serve with giffgaff 	New revenue streams

Figure 2: This figure illustrates examples of business models transformed by digitalisation. Source: Ersnt & Young, The Digitisation of Everything

Cascading down the internal lens enabling trends of digitalisation within the organisation, are employees who play a key role in the digital transformation. This group of stakeholders requires the human touch of a leader because the main connection between any strategy/business model and its customers is the people who are running the strategy and serving the customers. The bulk of an organisation is its employees, hence we strongly believe that humanising this organisational aspect is key to managing the digitalisation of organisation. To understand digital enablement impacting employees, we will explore intricacies related to the overall culture as well as innovation capabilities.

Starting with culture, this can be defined as the overall climate of the organisation that is influenced by both the obvious and subliminal habits and rituals within the organisation (Alvesson, 2013). The advent of digitalisation means that organisations will see more interactions between different departments, between machine-and-people, across hierarchies, across geographical barriers among others. A very simple example is this; texting an employee on work issues during annual leave. At one glance, this is an illustration of how simple it is to keep in touch despite not being physically possible. Yet, this has raised various issues of work-life balance, intrusion into private time that has resulted in organisational well-being concerns such as burnout, disengagement and absenteeism. Another example of a technological bane in connecting impossible boundaries is the growing policy of flexible working and remote working. However, this has also made performance management more challenging - do those observable in the office necessarily work harder than those who are intangibly offsite? Even though KPIs are put in place to determine performance objectively, our technology has not enabled enough perception that effort of those who are not visible tangibly are seen to be performing equally on par. Moreover, this increased sharing that has almost no boundaries allows information within the organisation to move faster than we can comprehend; it is as if we now have a digital grapevine. This is great news for mass communication as we no longer need to rely on the typed memo pasted on a notice board to spread important information as most organisations would have internal platforms and intranet chatting capabilities. This also means that even discrete information can spread across this digital grapevine without people leaving their physical space. Discrete information can be sensitive, or influential such as retrenchment news, policy changes down to minute issues such as how bosses have made certain decisions. This makes the water cooler conversations less necessary as people have digital water cooler sessions at the tips of their fingers. Organisations can leverage this to their benefit but also need to be aware that within an unhealthy culture, this may mean gossip and malice can spread faster. This will also mean that employees within the organisation need to be more aware of their behaviour and actions as information can travel beyond their comprehension, and thereby jeopardising their reputation.

Next, the culture will also impact the innovative capabilities of the company. In an era where all information is available freely, what may make or break an organisation is its capability to constantly change and manage the change. Constant change would rely on its employees' capabilities and capacities to think agile, to draw on interconnectedness, to be at a peak performing mental state in order to sustain the innovation and turn the ideas into executable products or services. A key cultural influence is in terms of a safe environment to experiment and one that enhances the collaborative capabilities of an organisation. With technology enabling these collaborations (i.e. SCRUM sprints), what matters in sustaining innovation is the psychological safety in which people feel safe taking interpersonal risks and won't feel judged if they fail. Let's face it, innovation will impact others within and beyond our circle and it will take guts and empowerment to act on it.

Automation

In automation, we are looking at organisations leveraging technology in order to replace a whole or a portion of their organisational structure. We see automation happening in various processes both as input and output which impact different stakeholders, especially both internal and external customers. Hence, we are looking at automation's impact on the customer experience and the organisation's succession plan.

One aspect of an organisation that will never change is the concept of a customer as the recipient of an organisation. No matter in which space it is, it will always be serving another party. This "other party" can be a paying retail customer, an organisation it supplies to or a community it serves. With the advent of digitization, organisations have incredible accessibility to their customers and vice-versa. We see this on two fronts, experience management technology and data harvesting (which we will cover a bit more in Analytics). First, experience management technology is what we define to be the various hardware and software that contribute to creating a customer's experience such as customer relationship management (i.e. SalesForce), proposal management platforms (i.e. Proposify), online catalogues or even cameras with infrared thermal readers. Each of these technological pieces aims to advance customer experience to the next level by providing efficiency and ease in process of obtaining their input, product and service. Burberry, the iconic British luxury brand has successfully increase their growth rate by using technology to support their in-house customer experience while using ERP systems to bring together global processes and data (Westerman, Tannou, Bonnet, Ferraris & McAfee, n.d.). More importantly, this has increased expectations at the customers' end when it comes to the level of service. If a mamak in Malaysia can implement an iPad point-of-sale system to take down customer's orders, what level of service are we expecting for organisations who brand themselves with more premium psychographics? This form of automation can easily become differentiation factors and strategic competitive advantage for organisations who use them right.

When we take a look internally at how automation impacts the employees, we see the biggest change when it comes to Human Resources Management or now more commonly known as e-HRM. For example, there are various platforms for talent management systems in the market. We know conceptually that talent management has three key components which are Talent Recruitment/Selection, Talent Development and Talent Retention. Thus, e-HRM provides efficiency and sustainability of data by automating process such as CV filteration, performance management and individual development plan tracker. Interestingly, this has both increased and decreased the amount of time leaders spend in talent management. It has increased the amount of time leaders take to input their performance feedback into complicated tables, understanding how to use a development tracking software yet decreased the face time they actually have with the identified talent. This irony has led employees to become just a checklist of goals and a rounded number for their bonus check at the end of their year. There is no element of human relationships as managers are so used to being behind the screen that the one hour mandatory face-to-face performance feedback is regurgitating data they have struggled to input. Automation has conveniently become the crutch for leaders and managers who prefer not to deal with the messiness of human emotions. This explains why big organisations such as Deloitte and Accenture are moving away from an over-reliance of performance technology and shifting to structures that promote just-in-time feedback without compromising the effectiveness of automation (Cunningham & McGregor, 2015). On top of that, automation also means that certain roles can be replaced with technology and that usually means limited types of talents being absorbed into organisations. Beyond getting our education system to realise automation and its effect on future jobs, roles in organisation are starting to be redesigned to complement their talents and needs of the organisation. Otherwise, we end up with a homogenous pool of talents, and that may not be healthy for an organisation looking to grow. Ultimately, succession planning is about growing future leaders for the organisation, and no complex algorithm can possibly replace the experience of growing a talent through realtime relationship or considering the user experience in designing a role.

Analytics

Analytics is almost always the welcomed result of technology enablement and automation. Data harvesting using various digital platforms provide massive amount of output that can assist organisations in better understanding the ecosystem the play in. From a business perspective,

this provides organisations with a distinct advantage to treat their customers better, by personalising the end product or service, by predicting what the customer may want in the future, and in the bigger scale, understanding buying patterns that will help organisations create the right products and services. Internally with organisations, it means better capability of tracking whether it is talent development, organisational engagement level or extrapolating future budget. On the other hand, this leaves us with the conundrum of data privacy, as pointed out by Marie Wallace, an analytics strategist with IBM. In her journey with data, she finds that one of the biggest challenges faced by analytics brought on by digitalisation is the inevitable mistrust on what happens to data that has been collected. Much like the issues organisations like Facebook have been embroiled with, customers' trust are easily eroded when they are not aware that certain private data is being harvested or that these data are been used for purposes they do not know.

How do organisations balance between using data for the good of customers vs for the need of the organisation? This is very much a grey area which has been debated whether in terms of in-bound marketing, website cookies etc. But what this also means is that organisations and especially its leaders in working with customer's data need to be more transparent and ready to divulge when needed. In Wallace's internal project with IBM on collecting social connection data of its employees, she finds that the simple act of being transparent and consciously giving employees the options on what to share and how it is to be used has resulted even in the most skeptical employees who are against technology to be providing important information on these social connections. The other conundrum organisations almost always face with analytics is the amount of data and how to make meaningful sense out of it. More importantly, how do leaders manage the large volume and diversity of data to draw insights that will be relevant to decision making? Thus, analytics while is an exciting outcome of digitalisation, is also the perplexing outcome when it comes to integration and application.

PART 3: THE 3 R'S IN LENDING A HUMAN TOUCH

As described in Part 2, it is no longer a matter of if digitalisation changes the trends of organisations, but when it changes the organisation. More importantly, it will mean very different ways of leading our organisation beyond data bytes and moving towards instilling the human touch. Hay Group's research on the future of leadership speaks about the need for leaders to have digital wisdom. While their context looked at the wisdom in accepting what is new and not natural to what we have always known, we see this digital leadership wisdom lending its human touch to this digital era through the 3R's of Respect, Reliability and Redefining.

Respect

How does it feel when someone respects you? Respect encompasses a large area of leadership particularly relating to how leaders interact in a digital organisation. Examples of respect being exhibited by leaders are fostering face-to-face engagement, having empathy and bottom-up listening. As mentioned above, digitalisation allows for the breaking of geographical boundaries, constant accessibility to people and the use of technology in improving efficiency of people processes. BUT, this cannot happen in a vacumn nor can it be taken for granted. If anything, the leader needs to focus more on humanistic aspects in complementing the digital power. In our work as a leadership development organisation, an infamous situation that often happens with digitalisation is when employees are not aware of the competencies they are being measured against; hence, in development programmes there is no benchmark of progress to be tracked.

When we probed deeper, we realised that even their superiors are not aware of these competencies because beyond its complicated competency jargon, it is time-consuming to facilitate the understanding of these measurement especially if there is a digital (fire)wall they can hide behind. It is exactly because of the ease of giving feedback that leaders need to respect employees enough to speak to them face-to-face, to coach them because data is now available at their fingers. Especially when structured with just-in-time feedback, leaders have no excuse to not use available data to increase the pace of development by providing the real-time engagement as a mentor and facilitator. Other ways of respecting relationships is to understand the different boundaries that have been blurred by digitalisation. Whatsapp messages at 11pm and emails at 3am may not be a concern to a leader who is naturally a night owl but it creates a perception of unnecessary urgency on the recipient's end. The convenient digital wall we have leads us to forget there is a real breathing living human being on the other side. Leaders end up practicing what Daniel Kahneman calls the System 1 thinking which is a fast-paced thinking process we use to quickly segregate our world efficiently as opposed to System 2 which moves more deliberately and is rational in coming to decisions - angry emails to clients are an example of System 1 thinking. Furthermore, it is easy to leave our mindset to be influenced by the urgency of a rushing world that we forget to listen because it requires attention and slowing down. Technology is an asynchronous communication method hence clarity of communication can be compromised sans the non-verbal cues. Hence, it is extra effort needed to take the perspective of the person we are communicating and relating to - Can I tweet about a particular work situation? What would be the best way to send this message? Similarly, this accessibility has resulted in the interesting notion that ideas can now travel in various directions of the organisational structure (i.e. upwards, across, downwards) which means that leaders' active listening is put to the test first in sieving the amount of information and second in relying on the bottom-up messages to make decisions. Charlene Li, who is a thought leader in the area of digital leadership suggests that the one key thing leaders of this digitalised era need to give up on is control. Now that barriers of communication are looser and interconnected, employees may have the fastest information available on the ground particularly if they are in contact with externals such as customers. To imagine that only leaders have access to certain information would be distaste to the capabilities of technology; thus leaders, open up your ears, your followers may know more than you think. At the same time, as respectful leaders, it also means that they set certain boundaries rather than giving up total control but these boundaries are set in engagement with their followers. The democratising of information means that respect is earned and leaders who role-model the right behaviour and boundaries will reduce instances in which communication goes out of hand such as how tweets have led to employees being fired. This respect goes beyond the policies of no-Facebooking-during-work-hours and instead focuses on building the right relationships to bring out the best of digitalisation.

Reliability

Lending a human touch to digital leadership also requires the second R of Reliability which is a key component of leadership particularly in the VUCA (Vulnerability, Uncertain, Complexity, Ambiguous) environment. This showcases an irony because how could reliability exist in the midst of all these uncertainty even more so when digitalisation presents with itself such broad horizons and boundaries. Thus, the human touch a leader needs to provide is by being both competent in capability and character. With the availability and accessibility to information, leaders can very well build their repertoire as an expert-generalist (Simmons, 2015), which combines certain depth pillars across a breadth of areas. This would not have been possible 10 years back when developing one's expertise is a slow one-track path. But now there is no excuse

to build one's competence particularly across different areas. Leaders who are comfortable in their space and are constant learners are more likely to gain the trust of followers when it comes to credibility and it is this trust that will help followers navigate through the complexity of digital organisations. The other aspect of reliability is on character. This is when a leader's integrity and ethics are relied on beyond the data protection policies, the rumour mill and digital grapevine that can be disastrous to an organisation. And reliability in character can only be obtained through conscious vulnerability in which the leader, however expert-generalist they are, are willing to humbly accept when they do not know. The years of the bravado, superhero leader are over and followers look to leaders who are true to their words; leaders who talk the talk. When overcommunication becomes the norm, when there are digital walls between people, a leader's words and actions becomes the anchor of how people will act in an organisation. A callous email, a leak in customers' data privacy that is not carefully handled by a leader becomes the leader's lasting brand. As mentioned earlier, the vast communication networks in the digital world easily spread messages even when it is not helpful. Followers need to know their leaders are people they can trust in empowering the organisation's purpose which is often an expectation of alignment with their personal values. While countries such as Malaysia has the Personal Data Protection Act, what we need is ethical leadership who police such acts and rules rather than leaving it to purely justice systems. An ethical leader who seeks consistency by being a competent character and capability is more likely able to lead their followers at this tipping point of the great digitalisation transformation.

Redefining

Finally, the third R refers to Redefining whereby the leader of this digital era humanises his or her leadership by leveraging on technology for better options and not the easier options. Stakeholder value now includes the impacted community, the suppliers and the lone developer; thus, when leaders have the foresight to grow value beyond the organisational profits, it is when the organisation truly embraces humanity. The future of jobs was an area we discussed in the automation brought about by digitalisation. Can the leader in this era redefine their talent space enough that they have the foresight to impact educational systems to bring in the right talent? Part of our graduate development work involves integrating the organisational needs and university needs to develop a pool of selected talents that will be the beginning of the organisation's pipeline. On one hand, we see the leaders who are far-sighted enough to see the disruption of pipeline in the looming digital era, on the other hand, we see young potentials benefiting from the apprenticeship and the right development that builds their skills for a career.

Leaders in the digital era need to be able to see beyond their current space and dream of the best. Of course, the fast pace of newness that comes from digitalisation needs to first be embraced with openness by the leader who sees opportunities for innovation as this then inspires the organisation to dream and see the impossible. Leaders that humanise digitalisation do not just protect people from its negative consequences but also empower their followers to dream even further than they can. An inspiring organisation is a humanistic organisation as it taps into the best and most ideal capabilities of its employees. Even when it comes to managing the change that happens at a faster pace, leaders can leverage the accessibility to build more champions particularly with middle managers who are often touted to be toughest sceptics. The right dissemination of information and respected boundaries of communication can be key to leaders to mobilise their most operational layer to enact change and redefining the organisation's growth.

PART 4: MALAYSIA - NOW AND WHERE TO NEXT?

Even in Malaysia, leadership has been identified as one of the key drivers in building a successful and sustainable digital ecosystem for the country (Digital Malaysia, 2013). This form of leadership is particularly defined by thought leadership, political will, visionary thinking, and consistent communication of goals and plans. With a Digital Malaysia Initiative to increase citizen income and unlock entrepreneurship potential particularly for those below 40, it is safe to say that there will be more and more leaders who are directly involved in technology and lead digitalbased organisations. In the Digital Malaysia e-book, it is also noted that there are 8 key projects in changing the digital landscape in Malaysia; two of which we feel is a great reflection of the need for leaders with digital wisdom in the country. The first is related to the initiative mention above in which the project focuses on microsourcing jobs to those in the B40 (the 40% of citizens at the lowest income tier) particularly those who are at a disadvantage such as single mothers, the disabled, the underprivilege by providing them a small space for their input in order to generate financial output. This is similar to Andrew McAfee's observation on how hobbyists are flourishing and they are capable of producing input that once was only possible by giant manufacturers. This also signifies that Malaysian digital leaders need to be prepared to respect the different backgrounds of people that their organisation may work with and redefine the boundaries of team as well as what it means to collaborate in achieving performance. The other interesting project we noted is called the Asian e-fulfillment hub in which Malaysia intends to ride on the e-commerce growth particularly in the logistics sector whereby Malaysia can use its regional connectivity to integrate different values parts of a logistics process (i.e. packaging and tracking) in order to create satisfying customer experience at a lower cost. This could mean potential for leaders of organisations to go regional or even play in a global space whereby their reliability is benchmarked against the best practices overseas - data protection is no longer and national responsibility, it is the integrity at an international level and agility in handling inter-cultural relationships.



Figure 3: EIU's Digital Economy Ranking. This figure illustrates Malaysia's standing in comparison to other countries in terms of the digital economy influence.

Source: Digital Malaysia e-book

We believe what is next for Malaysia could be extrapolated from the understanding of how we behave and one such perspective is our cultural landscape. Based on Hofstede's five cultural dimensions, Malaysia is generally understood to have a very high power distance, strong collectivistic way of relating, low preference for avoiding uncertainty, a normative culture and an ambiguous preference of masculine vs feminine values. The simplistic interpretation to this is that we respect hierarchies very much, are keen to foster relationships with a hold on moral values, tolerance from deviation of the norm or rules, more short-term thinking and a lack of preference when it comes to achievement vs passion. Combining this with active national digitalisation policies and global pressures to move towards the digital and technology, we would expect the leaders of organisations to face challenges when it comes to empowering employees to dream for the future and to strive for it. However, given the power distance, our need for relationships and our tolerance for differences, leaders could do well to humanise the impending digitalisation by role modeling with integrity, respecting the way we communicate and to leverage on capability to tolerate deviation to see innovation as non-threatening. We know that the national agenda is to increase Malaysia's ICT standing, so leaders need to already start seeing their followers as humans in this bigger growth agenda.

CONCLUSION

We end our exploration of lending the human touch to digital leadership with an understanding of how digitalisation trends do not immediately convert to successful distinct performances without an awareness of the need to include humanity. Since digitalisation is truly the powerhouse of future economic and social benefits, leaders need to embrace being part of this change, and remember that seeing people as whole does not create analogous inconsistencies and instead build the discrete pillars of foundation in sustaining the impacts of this welcomed digital transformation.

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CHAPTER 04:

The Digital Overhaul: Rethinking Manufacturing in the Digital Age

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DIGITAL OPERATIONS FOR TODAY'S WORLD

Digital operations unleash entirely new business models enabled by the Internet of Things (IoT) and fueled by mobility, cloud and analytic insight through a global network of instrumented, interconnected and intelligent people and things. IBM Digital Operations includes integrated services, software and infrastructure solutions. Our portfolio includes Predictive Asset Optimization, Smarter Home and Appliance, Smarter Energy, Connected Health, Instrumented Value Chain, Connected Vehicle, Digital Hospital of the Future and Connected Retail. Connect with us to navigate the dynamic, rapidly changing IoT landscape.

EXECUTIVE SUMMARY

Many sourcing and manufacturing decisions made since the 1990s have been based on the notion that Asia (specifically China), Eastern Europe and Latin America are lower-cost regions, while the United States, Western Europe and Japan are higher-cost regions. However, this view is increasingly outdated. Changes in wages, transportation and distribution costs, productivity and energy availability are upsetting the traditional equation to determine where to source, where to manufacture and how to go to market. Total delivered cost must be analyzed to determine the best places to locate sources of supply, manufacturing and assembly operations around the world.

Meanwhile, the age of digital manufacturing and operations is here and moving very fast. Technology advances and growth in areas such as big data and analytics, cloud, the Internet of Things (IoT), robotics and additive manufacturing are rapidly changing industry dynamics. These technologies are also generating a dramatic ripple effect as they change the nature of jobs in industries that supply, support and serve manufacturing as it becomes more knowledge intensive.

In the age of digital operations, information previously created by people will increasingly be generated by machines and things - flowing out of sensors, RFID tags, meters, actuators, GPS and more. Inventory will count itself. Containers will detect their contents. Manufacturing assembly will be robotic and analytically automated. The entire value chain will be connected - not just customers, suppliers and information, but also parts, products and other smart objects used to monitor the value chain. Extensive connectivity will enable worldwide networks to plan and make decisions in real time.

In addition, advanced analytics and modeling will help decision makers evaluate alternatives against an incredibly complex and dynamic set of risks and constraints. Smarter systems will make some decisions automatically - increasing responsiveness and limiting the need for human intervention.

To thrive in the digital age, we suggest manufacturers embrace a value chain redesign based on today's changing cost dynamics, as well as exploit new-era technologies to make their value chains more instrumented and intelligent. As they do, they should be prepared to address the shifting talent needs that accompany the move to digital.



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Changes in total delivered cost are forcing a value chain redesign.

New-era technologies are changing the manufacturing landscape.

The digital overhaul will create new knowledge-intensive manufacturing iobs.

MANUFACTURING'S DIGITAL REVOLUTION

The digital age has brought with it a new way of thinking about manufacturing and operations. Labor rate changes in emerging economies, coupled with challenges associated with logistics and energy costs, are influencing global production and associated distribution decisions. Significant advances in technology, including big data and analytics, the Internet of Things (IoT), robotics and additive manufacturing, are shifting the capabilities and value proposition of global manufacturing. In response, manufacturing and operations require a digital overhaul: The value chain must be redesigned and retooled and the workforce retrained – quickly.

GLOBAL MANUFACTURING'S CHANGING ECONOMICS

Many companies have discovered that manufacturing closer to their customer base now makes the most sense. Corporate decision makers are increasingly aware of the need to adapt manufacturing activities and rethink global value chains to reflect changes in operating costs and conditions in traditional offshoring and production platforms. With rising labor costs in China and other emerging low-cost regions, high supply chain and logistics costs, and wide cost differentials around the world for electricity and natural gas, many organizations are once again relocating manufacturing and production.¹

Some labor-intensive jobs are moving out of China to Southeast Asia or the next emerging lowcost region. However, in industries more sensitive to transportation costs, such as consumer goods and appliances, many companies are "near-shoring" - moving manufacturing to locations near or within their key markets. This trend has been most evident in Mexico and various U.S. states for the North American market and countries in Central and Eastern Europe for the European market.² As labor costs in China soar, manufacturing labor costs in the United States and the Czech Republic have decreased, further bolstering the argument for near shoring.³

Rapid changes in wages, labor productivity, energy costs and exchange rates have driven dramatic changes in relative manufacturing cost structures. Companies must evaluate their production locations based on total delivered cost and service levels, as they reassess and realign their global sourcing networks and production footprints. Although direct manufacturing costs may be cheaper in a given economic location, it is necessary to consider the multi-tiered value chain, including component parts and material supply, assembly, packaging requirements and added transportation and logistics costs. Also, it is important to consider the hidden costs of extended global value chains such as speed to market, greater agility, and increased ability to customize products and services for specific market segments.

GOING DIGITAL: TIRE MANUFACTURER

To better compete in the age of digital operations, a major tire manufacturer in Europe needed to redesign its supply network and production processes. Tire manufacturing uses multiple raw materials, including chemicals, rubber, metal and fabrics, in a complex process that requires hundreds of steps to produce each final product. Some tire components can be sourced only from a limited number of suppliers worldwide and require long lead times for delivery.

The manufacturer implemented a comprehensive forecasting, production planning and manufacturing execution solution to manage the company's diverse product portfolio. The new solution captures 10 million data elements that impact allocation and capacity planning, including individual plant, supplier, machine, product-related and workforce data; centralizes data to support a collaborative and iterative planning process across the global organization; and uses scenario-based analysis at the plant level for capacity planning and to anticipate potential bottlenecks.

THE TECHNOLOGIES BEHIND THE DIGITAL OVERHAUL

Continued advances in areas like big data and analytics, cloud, the Internet of Things (IoT), robotics and additive manufacturing are ushering in new opportunities to drive efficiencies and optimize manufacturing, with tremendous implications for global value chains (see Figure 1). These technologies facilitate the elimination of labor, help make regionalization and localization more economical, and enable improved customer service and production efficiency at every level.

The IoT provides a foundation for digital technologies to transform manufacturing



Figure 1: Digital manufacturing technologies⁴

BIG DATA, ANALYTICS AND CLOUD

In a 2014 survey of manufacturers, almost half indicated that big data and analytics will have a major impact on company performance, while over 70 percent expect these technologies will change the way manufacturing operations are managed in the future.⁵ Operational executives realize that collecting and analyzing data from all aspects of the value chain in real time can be much more powerful than previous transactional, ad hoc data collection and analysis.

Operational analytics can be applied virtually within each operational process, ranging from network optimization to real-time event management and across all time horizons. Analytics can enhance manufacturing capabilities that allow inventory and production decisions to be made without human intervention and can also help determine the root cause of recurring defects or repeatedly late deliveries.

The increasing maturity of analytics capabilities in general, driven by advances in areas like cloud computing, mobility, and data storage and security management, will undoubtedly impact the adoption of operational analytics. Armed with historical as well as real-time data from the entire value chain, leaders can make more timely, insightful decisions, as well as optimize value chains to more effectively use resources to deliver the best products and services for their customers.

Underscoring innovation in big data and analytics is cloud computing. Cloud computing can help organizations pull more insights out of the massive floods of data they collect daily from transactions, social networks and mobile applications. Its adaptability provides a foundation for rolling out new analytics, social and mobile solutions and sharing data with partners and customers. By enabling businesses to quickly adjust their processes, products and services to meet the changing needs of consumers, employees and partners, cloud helps shorten innovation, prototype and time-to-market cycles for manufacturers.⁶

INTERNET OF THINGS

Early phases of the Internet included connecting people to static information and more recently, people to people. Now, the Internet continues to evolve as it connects people to physical things and physical things to other physical things, all in real time with billions of interconnected smart devices with chips, sensors and actuators that sense, capture, communicate and predictively respond to all types of data.

The IoT represents an evolution in which objects are capable of interacting with other objects without human intervention. There has been a shift from monitoring-based human decisions to real-time predictive insights and automated decisions. As the number of devices connected to the Internet continues to grow exponentially, an organization's ability to send, receive, gather, analyze and respond to events from any connected device increases as well.

Manufacturers are embracing the IoT for a number of reasons (see Figure 2). In general, they seek to instrument their value chains – from the sourcing of raw materials to the customer delivery and, in some cases, the maintenance and service of already-delivered items.

Intelligent IoT systems enable rapid manufacturing of new products, dynamic response to product demands, and real-time optimization of manufacturing production and supply chain networks through interconnectivity of machinery, sensors and control systems. IoT systems also extend to asset management via predictive maintenance, statistical evaluation and measurements to help increase reliability. Smart industrial management systems can also be integrated with the smart grid, thereby enabling real-time energy optimization. In addition, IoT and cloud-based GPS solutions can help increase visibility of goods in transit. These solutions make it possible to track individual items via chips that "talk" to each other, transmitting data such as identification, location, temperature, pressure and humidity.⁷

"In the IoT of hundreds of billions of devices, connectivity and intelligence will be a means to better products and experiences, not an end."⁸ Lower operational costs

	54%
	58%
Customer acquisition and/or retention	
38	96
	49%
Better customer service and support	
	49%
	48%
Business process efficiency/operations optimization/control	41%
378	
Competitive differentiation	
32%	
28%	
Better supply chain management and logistics	
32%	
24%	
Product and/or service improvement and innovation	
38	3ae
24%	
T optimization and/or modernization	
	40%
22%	
Access to new information	Process manufacturing (n=165)
19%	Discrete manufacturing (n=95)
15%	

Question: Which of the following areas have been identified as significant drivers of your organization's Internet of Things initiatives over the next 12–24 months? Source: IDG Perspective: The Internet of Things Gains Momentum in Manufacturing in 2015, doc #MI253743, January 2015.

Figure 2: Manufacturers' drivers for IoT initiatives

EMBRACING THE IOT FOR PREVENTIVE MAINTENANCE

In the highly specialized and costly business of manufacturing and servicing huge multimilliondollar pieces of mining equipment, preventive maintenance on critical components can save hundreds of millions of dollars. Recognizing the need to reduce machine downtime through faster diagnosis and correction of equipment faults and breakdowns, a mining equipment service provider sought a digital solution.

The company implemented a solution that collects and integrates thousands of data points streaming from hundreds of machine sensors and then analyzes the integrated data to determine machine-health status. Alerts and optimized service recommendations are sent to field technicians on their tablets to help prevent costly equipment failures. In addition, housing the integrated data in a cloud provides users in the field and at service centers a 360-degree view into equipment health status.

ROBOTICS

The use of robotics in manufacturing continues to increase as new applications are found across the value chain - from production to warehousing, distribution and the customer. Robotics can help companies reduce or eliminate defects, optimize productivity and localize supply chains in a cost-effective manner. As part of the IoT, these robots serve as devices that send and receive signals from applications, making the robots themselves adaptable to changing production and logistics environments. While some technologies, such as driverless trucks, ships and drones, are still in development, others are transforming value chains today.

The International Federation of Robotics estimated 15 percent growth in robot installations in 2014 and expects that growth to continue at an average of 12 percent per year through 2017 (see Figure 3). And, while robotics' main customer – the automotive industry – drives much of this growth, robotics use is starting to increase in other industries as well, including electrical/ electronics, rubber and plastics, pharmaceutical, food and beverage, and metal and machinery.⁹ Robotics use could spark a field-leveling transformation by eliminating the need for some labor while increasing repeatability and, thus, quality. This decreased labor need means assembly tasks could occur anywhere, not just where low labor rates are available, enabling regionalization.



Figure 3: Worldwide annual supply of industrial robots

ROBOTICS AND INVENTORY MANAGEMENT

From assembly line improvements to the use of robotics and lean production methods, auto manufacturers have sought ways to cut costs, improve efficiency and satisfy evolving customer demands. However, automakers do not operate alone. They are dependent on a complex global network of parts suppliers. And these suppliers typically try to maintain the lowest inventory possible while still delivering the right part at the right time.

Understanding this need for pinpoint monitoring of production, inventory and supply chain management, a parts manufacturer implemented a cloud-based manufacturing execution system to monitor and control when to insert its plastic injection-molded parts into the assembly process. The system automatically plans and executes production schedules that optimize the plant's production potential, allowing it to meet customer expectations for quality and on-time delivery. It uses real-time input from robotic machines on the shop floor and two-way communication with operators to help ensure equipment is working and that individuals and the plant as a whole are working toward the same goals.

ADDITIVE MANUFACTURING

Additive manufacturing (commonly called 3D printing) includes a number of technologies based on several different physical mechanisms, the common feature being the generation of a threedimensional physical object from a digital model. Because the process is additive in nature and materials are laid down only where needed, it results in significantly less material waste than traditional manufacturing techniques. Originally used for the rapid production of prototypes for form and fit testing, applications are evolving toward the manufacture of final products. Although advances continue, 3D printing of final products can still be relatively slow compared to traditional manufacturing methods. However, new design advances and raw material availability make the economic production of near final components more realistic. In fact, recent research conducted by the IBM Institute for Business Value indicates that 3D printing is reinventing the design, production, transportation and consumption of products around the world, making local manufacturing a real option (see Figure 4).¹⁰

Advancements in these technologies will continue to influence how and where work is performed and decisions are made. The implication for instrumented value chains is immense. Companies will need to reimagine their device strategies, information technology capabilities and manufacturing processes, as well as determine the most effective points of intervention to optimize the system. And they will have to hire and retain the talent needed to manage those interventions to work within this new landscape.

3D printing could reduce prices while improving selection and fulfillment



Price

Less material waste, reduced labor and fewer transportation costs could allow retailers to lower prices without losing revenue



Selection

Selection becomes unlimited as availability depends on designs rather than warehousing space



Personalization

Every product can be easily customized, and at no additional cost



Delivery

As production can take place closer to demand or even in-home, significant chunks of the current supply chain and related transportation needs become irrelevant

3D printing has the potential to transform most aspects of manufacturing



Quality

Determined by the 3D printer, its configuration, and the quality of the raw material inputs

Scale

Becomes almost irrelevant for every aspect of production except delivery of raw material inputs

Automation

Becomes irrelevant to the production process

Labor

Becomes irrelevant to the production process, enabling labor to focus more attention on design, personalization, etc.



Design

Cost and complexity trade-offs fade away as each individual producer is empowered to make personal decisions about what to produce

Source: Peterson, Steve; Mark Bedeman; and Daria Godunova. "Shifting transport paradigms: Understanding the implications of 3D printing on the global transportation industry." IBM Global Business Services. September 2014.

Figure 4: 3D printing could diminish the importance of manufacturing location

THE DIGITAL OVERHAUL REQUIRES KNOWLEDGE WORKERS

Advanced manufacturing technologies are rapidly transforming the global competitive landscape by marrying industrial automation with information technology to optimize the efficiency, productivity and output of plants and supply networks. These new technologies and the use of more non-manufactured supplies, high-tech services, IT support, heavy analytics and higherend equipment generate a "ripple effect" that can create millions of jobs in other sectors.

Smart manufacturing hubs are surrounded by layers of dynamic supplier networks, external support firms and outside service organizations - creating waves of indirect jobs necessary to supply, support and serve them. Understanding these new manufacturing ecosystems will help industry leaders illustrate once again the pivotal role manufacturing plays in creating jobs. To operate in the digital age of smarter manufacturing, more professional and higher-skilled workers are required, including technicians who maintain the highly automated and IT-driven manufacturing processes, data analysts, financial planners, R&D innovators, logistics and transportation specialists, customer service and technical support specialists, regulatory affairs and safety professionals, and modeling and simulation experts to optimize factory throughput.

On average, the manufacturing multiplier is 1.58, which means that a typical manufacturing facility employing 100 people actually supports 158 jobs. As factories become more advanced, the multiplier increases significantly.12 Recruiting and training the right people to help move the industry forward no longer simply involves finding people with the necessary skill set to perform more traditional manufacturing roles (such as engineering). The digital age requires a mobile, connected and cloud-enabled workforce. Many companies are struggling to find the technical and managerial talent necessary to develop and run innovative manufacturing tools and systems.

Educational systems must adapt to meet these critical needs across industries and geographies. A recent study by the IBM Institute for Business Value found that academic leaders are aware of the curriculum changes they need to make to address disruptions caused by new technologies. Actually, 73 percent of academic leaders acknowledge that technology is disrupting the traditional education model, and 56 percent of educational service providers understand that keeping workforce skills current with rapid advancement of technology is one of their greatest challenges.14

Clearly, it will be necessary to enhance workforce knowledge-based skills with additional training. Many companies are also reaching out to partners in their extended value chains to acquire the skills needed for a digital overhaul.

"Technologies always become outdated by new technological change. The innovative industries of yesterday are shedding jobs today."¹³

UNDERSTANDING THE "RIPPLE EFFECT"

Manufacturing has a larger multiplier effect than any other major economic activity. The multiplier effect extends to include the indirect creation of jobs in the industries that supply, support and serve smart manufacturing.^{II}
RECOMMENDATIONS

REDESIGN YOUR VALUE CHAIN NETWORK

Increased visibility from highly instrumented and interconnected value chains will help companies identify and eradicate global manufacturing and delivery bottlenecks and quality problems. In addition, big data and analytics enable the evaluation of myriad alternatives in terms of supply, manufacturing and distribution - and the flexibility to reconfigure as conditions change.

- Take advantage of millions of smart objects (IoT) that can report on whereabouts, temperature fluctuations and even theft or tampering.
- Capitalize on real-time connectivity across the extended value chain to respond in a rapid, coordinated fashion by modeling and simulating operations across the entire network.
- Implement intelligent systems to assess constraints and alternatives, allowing decision makers to simulate various courses of action.
- Supplement business knowledge with analytics knowledge. To begin, pilot new technologies that enable digital operations.

RETOOL YOUR VALUE CHAIN FOR THE NEW DIGITAL AGE

Instrument your operations with robotics and the IoT. Sensors, RFID tags, meters, actuators, GPS, and other devices and systems will increasingly generate value chain information previously created by people. Shipping containers, trucks, products and parts reporting on themselves will replace labor-based tracking and monitoring.

- Work with your logistics and other business partners to instrument operations.
- Where appropriate, implement additive manufacturing, robotics and IoT into your manufacturing and assembly processes to automate, create efficiencies and lower operational costs.
- Interconnect your value chain transactions with the objects and the machinery that makes your products in real time.
- Innovate your value chain to differentiate your products and services from competitors by interconnecting it.

RETRAIN YOUR EMPLOYEES AND CONNECT WITH PARTNERS

Make sure your workforce has the required skills for the future of manufacturing. As manufacturing jobs become increasingly analytical and technical, finding the right talent will be a challenge.

- Develop a strategic workforce plan that identifies the requirements for both building within the organization through training and buying talent outside the organization.
- Supplement skill gaps from your partner network while optimizing your global network of talent.
- Establish a formal career path for analytics professionals, with rapid skill development programs.
- Apply workforce analytics to manage the supply and demand of human capital, just as you apply advanced analytics to manage your physical capital.

ARE YOU READY FOR DIGITAL?

The financial impact of implementing digital manufacturing and operations is vast, as new technologies bring an enhanced level of automation, control and, therefore, quality. As your organizations prepares for a digital overhaul, consider these questions:

- Based on today's global economic framework, how will your company rethink and redesign its sourcing and manufacturing footprint and its overall value chain network? Will you consider total delivered cost in making these important decisions or continue to seek low-cost labor solutions?
- How will you leverage big data with advanced analytics to gain instantaneous reaction to operational disruptions and customer demand volatility?
- To what extent does your company engage a specific digital operations strategy that includes the deployment of new-era technologies such as the IoT and robotics?
- Why might your organization be reluctant to implement the latest technologies, especially those that can increase operating efficiencies, improve the customer experience and drive innovation? What can be done to remove barriers?
- How will your company reconfigure and retrain your global talent resources (within your organization and with your extended partner network) to support digital manufacturing and operations?

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CHAPTER 05:

Leadership in National ICT RD&C: A MIMOS Perspective

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INTRODUCTION

Research and Development (R&D) must generate value. Value can be in terms of products or services. In other words, where there is R&D, Commercialisation (C) is a given. Otherwise, R&D would be a waste. Hence, leadership in R&D implies coming out with enhanced or new products and services that are marketable.

This does not mean you have to develop a product or service all by yourself. You could collaborate with others and transfer your R&D results to them for further development. This could mean outright sale, licensing of technology or giving away for free. Whatever the mode of engagement, the end-game is that R&D should generate some value - be it social or economic.

Note the emphasis on enhanced or new. Enhanced implies incremental innovation whereas new or novel implies potential game-changing innovation. Doing more of the same would be a formula for failure since in any field these days, and in ICT especially, competition is stiff with many players and a multitude of products. Hence, a simple measure of R&D leadership would be high-impact outcomes in terms of social benefits or economic growth. Impact to society could be national, regional or global.

The greater the impact, the greater the R&D leadership. Firms such Apple, Microsoft, IBM, Samsung and Huawei pop up when we think of global R&D (innovation) leaders.

MIMOS is not your typical R&D company. It is a public research institute with a mandate to develop technology for consumption by the domestic industry to enhance the latter's competitiveness in the global arena. By default, therefore, MIMOS has to be an R&D (technology) leader since you cannot assist others if you are no better than them. Thus, for a start, MIMOS technology prowess must be superior compared to domestic industry players.

But technology competence is only one factor in the whole innovation game. Being a technology developer and broker, MIMOS must look beyond technology competence and its immediate borders - it needs to consider all aspects related to RD&C i.e. the entire ICT innovation ecosystem, at the very least.

The rest of the paper will discuss how MIMOS tackles R&D leadership so as to be in the position to contribute positively to local industry growth and national competitiveness.

I. R&D TO MEET REAL MARKET NEEDS

R&D must be market-oriented to generate socio-economic value. You also need to work on emerging technologies to explore their potential for novelty to enable and sustain innovation. You cannot just work with matured technologies and hope to win against competitor products.

R&D portfolios should, therefore, have a balance between 'market pull' and 'technology push' initiatives. This balanced R&D strategy is exemplified in the National Innovation Model (NIM) of Malaysia[1] as depicted in figure 1.

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Figure 1: Malaysia's National Innovation Model

This essentially is a combination of a technology-push (technology-driven) strategy and a market-pull (market-driven) strategy. In the technology-push approach, new technologies are developed based on technology trends, potential needs and novelty. Turnaround time to bring the technologies and associated products to market usually takes several years, depending on the technology type. Alternatively, in the market-pull approach, market needs drive technology and product development. Turnaround time is expected to be much shorter so as not to miss the commercialisation "window-of-opportunity". As a consequence, technology acquisition becomes a necessity in the market-pull approach.

MIMOS also uses the above mentioned strategy and advocates a 30:70 technology-push to market-pull ratio at the moment. This may change depending on market forces.

With respect to market, MIMOS focuses on nine market segments currently, as indicated in figure 2.



Figure 2: MIMOS' market segment focus

Presently, MIMOS' primary market segments are government, health, public safety and agriculture. The secondary market segments include communication, education, financial, oil & gas and electrical & electronics. The market segments have been chosen after taking into account strategic national needs as well as market potential. For example, health, agriculture, public safety and education are strategic focus areas in the Economic Transformation Programme (ETP)[2].

Although, this may seem as covering too broad a scope, in reality, it is not. We focus on crosscutting technologies that could be combined into strategic technology platforms to provide the needed functions for the applications (products and solutions) of a specific market segment. Normally, the applications we target usually revolve around a selected set of core functions. Where necessary, we develop specific functions to cater for specific applications.

Identifying the right market segments in line with global trends, high commercial potential and national strategic needs reflects only the first part of MIMOS leadership in ICT R&D. The second part lies in identifying the right technologies to meet the needs or address the problems of the identified markets.

2. THE RIGHT TECHNOLOGIES FOR THE RIGHT NEEDS AT THE RIGHT TIME

Meeting the needs or addressing the problems of the market involves the development of innovative applications (products and solutions). Applications could be developed with existing or matured technologies but this could lead to possible commoditisation of the applications. New technologies could give the edge via novel IPs. Further, new technologies could also open up new opportunities hitherto unexplored. Hence, using the right technology helps a lot in crafting innovative applications boasting novel functions and features.

MIMOS keeps track of the prevailing market and technology trends so that the strategic technology platforms it offers to the industry meet both current and future market needs. The technology platforms need to be future-proof at least for several years ahead so that the investments by the technology recipients (vendors) bear concrete returns. Future-proofing involves judicious marriage of both existing and emerging technologies as well as adequately protecting the R&D outputs via patents and copyrights.

According to global technology watchers such as IDC, Gartner and IEEE, two emerging technology trends that are going to have a huge impact on industry as well as the economy are Big Data and Internet of Things (IoT). Cognizant of the importance of these two megatrends, MIMOS has taken the leadership to champion R&D initiatives in these two areas at the national level.

Consider Big Data. MIMOS has been active in Big Data R&D since 2011. A sample of projects MIMOS has championed or is presently driving include:

- *Crime Prevention:* A system for the Royal Malaysian Police to analyse Big Data for efficient resource planning to mitigate crime in Malaysia. The project began in 2012 and to-date, a PoC system has been developed.
- Infectious Diseases: A "Healthcare Warehouse" system using Big Data analytics for the Ministry of Health. The system is currently in operation.

- Sentiment Analysis: A GST Sentiment Analysis PoC using structured and unstructured data for the Ministry of Communication and Multimedia, coordinated by MAMPU (October 2014).
- *Price Watch:* A system for the Ministry of Domestic Trade, Co-operatives and Consumerism that can extract and analyse price data from social media as well as predict and report prices. The project is on-going.

In support of the National Big Data Analytics (BDA) Innovation Network, MIMOS in collaboration with MAMPU, has also established a BDA Digital Government (DG) Lab at its premises. Activities at this BDA CoE will include research into advanced predictive and prescriptive analytics as well as the development of prototype products and solutions for use in government projects involving Big Data.

Let's look at IoT now. IoT involves, in essence, sensing (capturing), communicating and processing data for value delivery. We have been active in developing such data-intensive systems since 2010. Examples include:

- Agriculture:
 - Intelligent Pollination Management System (IPMS) (field-tested for improving oil-palm yield by Felda Agricultural Services Sdn Bhd at a site in Sungai Tekam);
 - Intelligent Green House Management System (IGHMS) (field-tested for monitoring chilli plants by Mutiara.com at a site in Bumbung Lima, Kepala Batas); and,
- Aquaculture: Pond Monitoring System (field-tested for monitoring shrimps by Blue Archipelago Bhd at a site in Setiu, Terengganu).

In May 2014, MIMOS (together with MOSTI) initiated the development of a National IoT Roadmap to guide the rollout of effective IoT initiatives nationwide so as to eventually create a dynamic domestic IoT industry. This Roadmap was endorsed by the Malaysian Government in May 2015. Following this, the IoT Week 2015 was organised in Kuala Lumpur (24 - 26 August) with the intention to gather input for the development of an Action Plan in line with strategies given in the Roadmap.

In conjunction with IoT Week 2015, the Big Data IoT Technology Acceleration (BIT-X) laboratory located at MIMOS was also launched. The BIT-X Lab aims to be the catalyst to drive the development of product and services founded on IoT.

Do note that irrespective of whether it is BDA, IoT or some other strategic technology of interest, MIMOS' mode of technology development will be platform-based. More on this is said in Section 5

The third part of MIMOS leadership in ICT R&D is reflected in its championing of the importance IP for national competitiveness.

3. STRENGTHENING IP REGIME FOR COMPETITIVENESS

Applications (products and solutions) that do not have IPs cannot be protected. If they cannot be protected, they can be copied (and usually will be, if they are good). Hence, protected applications command a better price in the market and you have a better chance of recouping your investment.

The R&D community, therefore, must realise the importance of IP and understand the processes involved – creation, protection, and subsequently, exploitation to realise economic value.

When MIMOS collaborates with university and industry partners, the importance and value of IP is always conveyed to them. For example, when we work with universities on joint research projects, we have upfront agreements on the exploitation of the resulting IPs. Traditionally, our local universities emphasised publication. However, their recent move towards "publish, patent, or perish" is encouraging and bodes well for the local R&D community.

Figure 3 illustrates the creation and exploitation of IP along the innovation value chain (RD&C value chain).



Figure 3: Creation and exploitation IP along the RD&C value chain

IPs (commonly, patents and copyrights) are usually generated during R&D. Following the MIMOS way of conducting R&D, the IPs created during research go into technology components, thence into platforms and subsequently into products. In addition, IPs can also be generated during development (platform and product development). Monetisation of IPs is via platforms and products. "Core" technology IPs (patents) generated during research could also be directly monetised depending on their intrinsic value.

We believe most of the IPs (especially, patents) created by our universities and research institutes have not been fully exploited. MyIPO may be sitting on a treasure trove!

MIMOS has, therefore, taken the initiative to collaborate with MyIPO with the intention to analyse and profile the existing patents and to generate, if possible, patent portfolios¹ that could potentially be exploited to provide greater economic value. The R&D fraternity could license these patent portfolios for incorporation into their technologies or products without the need to re-invent. This will save much time and cost in bringing innovative products to the market.

Figure 4 shows the various pathways our national IP (patent) assets can be mobilised and exploited to enhance national competitiveness.

¹ MIMOS' focus here is limited to ICT related patents. Other parties may collaborate with MyIPO to identify patent portfolios in technology fields of their interest.



Figure 4: The contributions of national IP assets to national competiveness

Note that profiling the national IP assets will enable us to determine the technology areas we have strength in as a nation. The insights gained should help national planners and decision makers on investing in further R&D initiatives. The fourth part of MIMOS leadership in ICT R&D is manifested in its efforts to create and energize innovation ecosystems to ensure sustainable innovation.

4. EXPEDITING TECHNOLOGY AND APPLICATION DEVELOPMENT

The National Innovation Model (NIM) captures the essence of a balanced strategy to bring innovations to market. How do you breathe life to the National Innovation Model? By infusing COIN (Collaborative Open Innovation Network) systems as depicted in figure 5.



Figure 5: The extended NIM incorporating the COIN concept.

The COIN serves to bring together the keys players in innovation ecosystem i.e. academia, research institutes and industry for synergistic innovation. Figure 6 illustrates the essence of the COIN concept.



Figure 6: The key components that make up a COIN.

Central to the COIN is the Open Innovation Platform (OIP). The OIP serves as a common ground for:

- The rapid development of applications (products and solutions) by providing a ready technology base;
- · Aligning research and development work towards meeting market needs; and,
- Enabling collaboration among university researchers, RI technology developers and industry players, especially product developers.

The CoEs serve to nurture Communities-of-Practice (CoPs) in identified technology areas. The co-learning and co-sharing engendered would lead to deeper knowledge development and better research efforts. Note that in addition to research CoPs, there is also a CoP dedicated to the development of the OIP. CoP members can come from universities, research institutes or industry, the only caveat being interest in knowledge sharing and new learning.

The industry players (technology companies) are the product and solution developers. They will work closely with the value-chain players of a particular market segment to meet their business needs. Figure 7 depicts a typical value chain for the agricultural market segment.



Figure 7: A typical value chain for agriculture.

Thus, the COIN in essence is an end-to-end innovation ecosystem specific to a particular technology focus area that can drive innovation productivity in a sustainable manner. Note that the COIN notion arose out of our practical experience in working with technology companies and business players to deliver products and end-to-end solutions to meet business needs.

You will also note that the COIN serves to implement the National Innovation Model in a systematic and structured way.

Recall our discussion on BDA and IoT initiatives in the previous section. To effectively drive them, the formation of appropriate COIN ecosystems for them is deemed critical.

CONCLUSION

MIMOS' mission is to help the domestic ICT industry to become globally competitive. We are approaching this challenge via a number of ways.

For the industry to be competitive, it must generate and deliver innovative products and services that are on par with those of its global competitors. We help to address this by identifying viable market segments and developing strategic technology platforms which could be used as the foundation to develop applications (products and solutions) and services to meet the needs or solve the problems in those market segments.

To date, about 63 industry vendors have licensed our platform technologies. These have helped the industry to win project contracts worth, in total, RM 1.06 billion (as of July 2015).

Being competitive also means pioneering new technologies. Big Data Analytics (BDA) and Internetof-Things (IoT) are two looming technologies with vast potential for economic exploitation. In view of this, MIMOS has initiated several strategies such the National IoT Roadmap and IoT CoE to fast-track R&D in IoT at the national level.

When dealing in new products and services in the market, IP protection is a given. Therefore, technology platforms we develop and license must be duly protected. In fact, very few vendors will want to license your technology if it does have IPs as unique value propositions. MIMOS strength in IP generation has been given due global recognition – MIMOS has been ranked 8th in the world for PCT filing by WIPO in the category for government and research institutes (2014). As of July 2015, we have also commercialised 294 IPs.

Enabling innovation to enable industry growth is not a solo game. Collaboration among key players is a must. To expedite and sustain the idea-to-market process, MIMOS has been championing the Open Innovation Platform (OIP) concept for several years, and more recently, the Collaborative Open Innovation Network (COIN), which is more comprehensive covering market/business entry and development as well. Our OIP strategy has delivered successes and we are confident the COIN strategy will also be fruitful.

Our strategy to support the domestic ICT industry has always been "enablement" by design. It follows, therefore, the leadership we strive to offer is one of enablement or empowerment.

In enabling the industry, we also enable our academic and RI partners to be successful in what they do: academia - commercialise their research; and, RIs - commercialise their technologies.

In summary, MIMOS' leadership in National ICT R&D is reflected in its efforts to champion:

- Market-oriented R&D to fast-track development of globally competitive domestic products and services;
- Strategic technology platforms based on emerging technologies with vast economic potential;
- IP generation, protection and exploitation for increased competitiveness and branding of products and services; and last but not least;
- Novel and practical models for galvanising innovation ecosystems towards greater productivity.

APPENDIX

[1] MOSTI, Malaysia.

[2] http://etp.pemandu.gov.my/upload/etp_handbook_chapter_1-4_economic_model.pdf

CHAPTER 06:

Change Management: Compelling Business Case for Change

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INTRODUCTION

Irrespective of size, companies generally have a simple goal – progress and stability. Nonetheless, shareholders want predictable earnings growth, if not more. If markets are either closed or undeveloped, leaders in these organisations could deliver on those expectations through annual goal and planning exercises. Perhaps, they may exercise modest modifications to the strategic plan to meet their expectations. In such a stable market environment, prices stay in check; people stay in their jobs; and more importantly, life is good for the employers and employees. But in reality, markets and businesses, as well as the economy are not necessarily stable. Businesses in today's market environment are continuously subjected to uncertainties and turmoil. Market transparency, labour mobility, global capital flows, and instantaneous communications have blown that comfortable scenario to smithereens. Thus, in such a situation, change is inevitable even for large and small companies in all industries.

CHANGE MANAGEMENT IN THE DIGITAL AGE

Business organisations and Governments are not the only ones to speak of change, in particular the magnitude of change, rate of change, unpredictability of change and implications of change; the layman on the street are also talking about it. Pertinently, they talk about disruptive technology or disruptive innovation, terms popularised by Harvard Business School professor Clayton Christensen.

Business Level Perspective: The following clearly illustrates the imperative for change management to be an integral component of organisational practices. With the impact of globalisation, market liberalisation and the information and communication technologies phenomenon, businesses in Malaysia face a number of tough challenges that distort harmony in the business environment. These include losing competitive edge in terms of closure of factories and businesses migrating to low-cost economies in the region; importation of cheap labour, economic and social problems; talent migration across borders in search of better remuneration and career advancements affecting talent retention locally; supply of employable fresh graduates impacting the quality of the competent work force; seeking globally-recognised standards and competencies critical for overseas expansion; ease of doing business; and capital flight arising from currency fluctuations etc.

National Level Perspective: Even at the country level, transformation is critical especially to migrate from the agro-industrial to information era with the advent of Internet technology and the associated digitisation processes. The onslaught of evolutionary and sometimes revolutionary technology is changing the roles, rights, rules and regulations in the governance of all spheres of life, and at an unexpected and unprecedented rate. However, such change management initiative at national level has yet to take place. Today, Malaysia is aggressively embarking on a number of transformation programmes, namely Economic Transformation Programme (ETP), Government Transformation Programme (GTP), Rural Transformation Programme (RTP) and Political Transformation Programe (PTP). The ETP, unveiled in 2010, is aimed at expanding higher value-added industries such as energy, financial services, and public transportation to generate value-added services to the economy, create employment including for well-paid jobs, and enhance the quality of life for all citizens. Similarly, the GTP is aimed at increasing the efficiency and efficacy in the delivery of Government services at the national, state and local government levels involving citizens and businesses. The Rural Transformation Programme (RTP), by its connotation, is aimed at improving the lives of the rural population vide higher

prices for their agricultural produce, lower prices of goods in rural shops, entrepreneurial training, financial assistance, better infrastructure, provision of amenities and facilities, quicker access to information and more economic activities.

Acknowledging that there is an ongoing need to balance between security needs and individual freedom especially in a multicultural and multiracial society like Malaysia, the PTP is a fresh approach to deal with differences. It replaces confrontation with dialogue, and promotes transparency and openness. Inherently, these transformation programmes are impinged with elements of uncertainty and changing the status quo as well as risks. In essence, the successful implementation of all the envisaged transformation programmes at the business organisation or national levels require tough and difficult trade-offs, particularly in the context of tighter fiscal resources and past public policies that the Malaysian society has been complacent with.

CHANGE IS A CONSTANT

Change is a constant, as illustrated in Figure 1. As quoted by Harvard Business School professor Rosabeth Moss Kanter, change can "develop a culture that just keeps moving all the time!" Nonetheless, one of the fundamental problems faced by many organisations including the big ones and multinationals when they embark on major transformation is their tendency to focus their attention on devising the best strategic and tactical plans. But, they fail to take into consideration the fact that transformation can only be realised provided organisations have an intimate understanding of the human side of change management.

Specifically, it entails the alignment of the company's culture, values, people, and behaviour to the business strategy to support and realise the desired results. Unfortunately, plans inherently do not capture values; values are realised only through the sustained, collective actions of employees who are responsible for designing, executing, and living with the changed environment.





Change management pundits have put it that long-term structural transformation has four elements that warrant due attention, as follows:

- Scale the change affects all or most organisations;
- Magnitude addresses whether it involves significant alterations of the status quo;
- Duration how long it lasts for months, if not years; and
- Strategic importance it inherently entails resource allocation and appropriation.

Companies will reap the rewards only when sustainable change occurs. Commitment and capability of the workforce are critical to success. Every organisation has to involve its workforce in Change Management, and enhance its workforce commitment and capability from merely Coping and Compliance to Contributing and Creativity. Any Change readiness at this highest level will increase the organisation's capability and capacity for success. CEOs involved in transformation often say they are concerned about how the work force will react; how they can get their team to work together; and how they will be able to lead their people. They also worry about retaining their company's unique values and sense of identity and about creating a culture of commitment and performance. Leadership teams that fail to plan for the human side of change often find themselves wondering why their best-laid plans have gone awry.

HOW CRUCIAL ARE HUMAN CAPABILITIES IN CHANGE MANAGEMENT AT THE BUSINESS ORGANISATION LEVEL?

This paper elucidates the imperative for change management at the organisational level. The question is how crucial are human capabilities to deliver, knowing these realities of change? Past researches have revealed that 83% of CEOs are anticipating major change.

Indeed, the disparity between expecting change and being able to handle it has nearly tripled from 2006 to 2008. Unfortunately, past experiences have revealed that 60-70% of change initiatives crucial to organisational success typically fail!

Target	Sponsors of Transformation	Transformation Leaders	Participants
Roles of parties involved in Transformation Agenda	 Support proposals to enable the Transformation Agenda for the organisation receive appropriate approval and financial support Enhance Leadership qualities and effectiveness of key staff leading the Transition Steer the Project Teams to continuously achieve greater heights of success Focus on results Develop leaders at all levels of the organisation Positive Leadership to Drive Transformation-Protecting corporate energy level and spirits 	 Formulate the long-term strategy and the Agenda for Transformation and initiatives Create opportunities to achieving and sustaining Value through Transformation Agenda and initiatives Provide detail scope of Projects related to the Transformation Leading Organization Transformation-Applying effective Change management leadership skills to engage stakeholders Lead and ensure successful execution Be proficient in the various knowledge and tools Formulate communications strategy and effectively engage with stakeholders Positive Leadership to Drive Transformation- Protecting corporate energy level and spirits 	 Positively Engaging to Deliver Results Overcoming resistances to Change Management Understanding relevant tools and knowledge an Transformation Understand the need for Transformation and give whalehearted support Participate positively in generating desired results Develop new work habits Positive Leadership to Drive Transformation- Protecting corporate energy level and spirits Inculcate the challenge -the - status guo mindset

Change Management Learning Focus

Figure 2

In line with the intensities and complexities of transformation initiatives being planned and executed in Malaysia, we must recognise the importance of equipping citizens and selected staff and our talent pool with the requisite knowledge, tools and capabilities to lead and/ or support the transformation initiatives in their respective organisations. Transformational leadership learning modules focus on the human side of transformation in organisations so as to enable the participants at all levels of the organisation. Figure 2 outlines the role of Change Sponsors, Change Leaders and Change Participants in enhancing their knowledge to lead and support current and future change management initiatives in order to achieve the desired results.

CHANGE ADAPTIVENESS

Phenomenal changes in organisations in the private and public sectors have impact on change adaptiveness that have a direct bearing on performance and business results; see Figure 3.



Figure 3

New work habits use hard facts and powerful logic with the reality of the response required from the workforce because of the global uncertainties and the underlying radical shifts in the world. These are the new realities we have to face. The earlier assumption that the future can be planned in predictable ways and our expectations that workforce can respond to change is no longer valid. Research has shown that people need to go through different stages with change - sometimes referred to as "the change curve." We define as the transition process. People progress through three stages whenever they go through organisational transition, and each stage produces different responses. At each stage in the transition process, Pritchett has come up with tools that can be used effectively to steer the workforce and the organisation towards the desired future state.

Organisations undergoing complex change need to be well equipped with a comprehensive set of tools that will help leaders to communicate effectively. Pritchett has come up with a multitude of tools designed to help sustain productivity and performance; identifying, recognising, and overcoming resistance; tools that help ensure organisations don't lose key people at a time when that risk is usually higher than normal. Stories are a great way of capturing people's attention and interest. Typically people remember stories better than theories, concepts, or even facts. Stories are a very good method to influence and grow commitment in others.

In addition to managing change, leaders at all levels in an organisation are accountable for managing the problems that naturally come with change. Leaders need to set their employees' expectations that, "No matter how well planned, change won't be trouble-free." This is the balanced perspective. Problems are inherent in change; they are not a sign that the change is wrong or being mismanaged.

CHANGE MANAGEMENT METHODOLOGY SELECTION

No single methodology fits every company, but there is a set of practices, tools, and techniques that can be adapted to a variety of situations. Similarly, there are numerous models available in the market that provide the requisite concept and philosophy of change management, process models, tools and templates. A structured approach to change management moves organisations away from merely reacting to resistance to change and provides a solid framework for engaging and mobilising impacted employees. Generically speaking, the number one selection criterion was the ease of use of the methodology. When change management is overly complex, it will fail to gain traction in the organisation and is seen more as a hassle than as a tool that delivers value to the organisation and the project. However, methodologies that are easy to use and easy to explain to others can gain serious traction and become a vital component of the project activities. Factors for ease of use include:

- Easy to implement
- Easy to understand
- Easy to communicate to others
- Simple and practical
- Structured and systematic
- Rational and logical
- Comprehensive and holistic

PRITCHETT CHANGE MANAGEMENT MODEL

Extensive research in Change Management and well-known learning programmes are used extensively worldwide by both the public and corporate sectors (mostly Fortune 500 companies) and have been used to enhance leadership capabilities and competency in leading and managing complex change management. In this paper, we illustrate the change management methodology and tools promulgated by Price Pritchett which have been used extensively by the top Fortune 500 companies. He grew up on a flat, dusty, wind-blown farm some 80 miles south of Amarillo, Texas. Mother Nature schooled him on uncertainty and change. As a kid, he learned how to live through farming's good times and bad, how to face reality yet remain an optimist, and how in the end, what really matters are hard results. He developed a deep respect for economy of means - getting the most done with the least effort, eliminating waste, and focusing on what counts most.

- This history helps explain PRITCHETT's belief system and style.
- We are minimalists in our approach.
- We believe in speed.
- We think time is money.
- We believe rapid results count more than pretty reports and slick slide decks.
- We know less can be more.

Dr Pritchett's philosophy since the beginning is to deliberately make his organisation as the best training and consulting firm in the field of Change Management.

PRITCHETT CHANGE MANAGEMENT OVERVIEW

Change Management in organisations causes unpredictability and uncertainty and uncertainty go hand in hand but uncertainty. The key challenges for Transformational Leaders are chiefly to reduce people's feelings of fear, anxiety and helplessness, protect productivity, and set the goals for successful organisational change. Successful change improves profits, build corporate momentum, and enhance productivity. Successful organisations address key uncertainties headon as such anxiety among the workforce can damage productivity, quality, customer service, talent retention' and, ultimately, profitability.

The Pritchett Change Management Methodology essentially warrants understanding the duration of change processes vide four states namely "present state", "transition state" and "desired future state" towards vision realised state, as reflected in Figure 4. As outlined in the Pritchett Model, vision can only be realised after going through four levels of "mentality" translation encompassing coping, complying, capitalising and creating. In the absence of such change processes, the status quo will be business as usual and the risk is organisational existence; or business performance would incrementally drop or even disappear altogether from the market space.





CAPACITY AND CAPABILITY BUILDING

As outlined in Figure 5, the four levels of capacity and capability building in the Pritchett Change Management Methodology address four types of "employee mentality", as follows:-

- Level 1 Coping addresses the "victim mentality", in which the employee's energy and attentions are focused on "me issues";
- Level 2 Comply pertains to "adjustment mentality". In this level, the employees are mere followers, not leaders and more so, difficulty to compete at the stretch level;
- Level 3 Capitalise deals with "opportunity mentality", in which employees turn change management initiatives into an advantage;
- Level 4 Creating stage depicts "possibilities mentality", by which employees become architects of their future trendsetter.



Figure 5

PRITCHETT CHANGE MANAGEMENT CORE THRUSTS

As reflected in Figure 6, the Pritchett Change Management entails three key thrusts areas namely:

- Migrating to fourth level of change;
- Making change management "simpler";
- Developing human capabilities at every level.

As depicted earlier, organisations should desire the fourth level of change, which is defined as the success zone for sustained personal and organisational achievements. Although emphatically "simpler", change management is based on structured discipline, not just nice to have, but must have. Only through a structured approach, can change management help organisations to move away from merely reacting to resistance to change and become a concrete framework for engaging and mobilising affected employees. However, the change management methodology

must be easy of use; when it is overtly complex, it will fail to gain traction in an organisation and it will be seen as more of a hassle and nuisance. Ease of use simply means easy to implement, easy to understand, easy to communicate to others, simple, practical, logical, systematic, comprehensive and holistic. More importantly, change management activities should be launched at the beginning of a project so that proactive participation from the impacted persons can be solicited; otherwise, an ad hoc approach will only lead to "fight fire" situations! Besides making change management "simpler", human capabilities need to be developed at every level to deliver results during times of uncertainty and change.



Figure 6

PRITCHETT IMPLEMENTATION MODEL

Like any other certification and accreditation programme, the Pritchett Change Management has its own curriculum and model elements, abbreviated as AD3S=Adapt, (see Figure 7) as follows:

A - Assess the imperative: Individuals are inherently rational and will question to what extent change is needed, whether the company is headed in the right direction, and whether they want to commit personally to making change happen. They will look to the leadership for answers. The articulation of a formal case for change and the creation of a written vision statement are invaluable opportunities to create or compel leadership-team alignment.

Three steps should be followed in developing the case: First, confront reality and articulate a convincing need for change. Second, demonstrate faith that the company has a viable future and the leadership to get there. Finally, provide a roadmap to guide behaviour and decision making. Leaders must then customise this message for various internal audiences, describing the pending change in terms that matter to the individuals.

D- Define organisation readiness actions: Change management requires both individual and an organisational perspective. Individual change management - organisations don't change, but individuals do. Irrespective of size, the success of a project ultimately lies with each employee doing their work differently, multiplied across all of the employees impacted by the change. Effective change management requires an understanding and appreciation of how one person makes a change initiative successful. There are processes and tools, especially communication and training, which can be used to facilitate change at the individual level. For organisational change management perspective entails how to scale change management activities and how to use the complete set of tools at the project leader and business manager levels.

Towards preparing for a change, three items warrant due attention. First, define change management strategy; second, prepare change management team; and third, develop sponsorship model. The output anticipated at the preparatory stage include change characteristics profile, organisational attributes profile, change management strategy, change management team structure and sponsor assessment, structure and roles.

D- Develop people readiness: The first step in managing any type of organisational change understands how to manage change with single individuals. In essence, to make a change successfully, an individual needs Prosci Model of individual change, called ADKAR – an acronym for Awareness, Desire, Knowledge, Ability and Reinforcement can be considered:

- awareness of the need for a change;
- desire to participate and support the change;
- knowledge on how to change;
- ability to implement required skills and behaviours; and
- reinforcement to sustain the change.

When an organisation undertakes an Change initiative, the implementation becomes a lot easier with employees who have successfully and confidently gone through ADKAR processes. Indeed, the ADKAR Model is an effective tool for planning change management activities; diagnosing gaps; developing corrective actions; and supporting managers.

D-Deploy participants for implementation: This phase focuses on creating the plans that are integrated into the project activities - what people typically think of when they talk about change management. In managing the change, two things warrant due attention. One is to develop change management plans and the other is take action and implement plans. In this stage, five plans should be created - communication plan, sponsor roadmap, training plan, coaching plan and resistance management plan.

S- Sustain energy for gain and pay-off: One of the critical items is to help project teams create specific action plans to ensure that the change is sustained. Specifically in this phase, project teams develop measures and mechanisms to see if the change has taken hold, to see if employees are actually doing their jobs the new way and to celebrate success. In reinforcing the change, three items warrant due attention. First, collect and analyse the feedback; diagnose gaps and manage resistance; and implement corrective actions and celebrate successes. The anticipated outcomes in this phase include reinforcement mechanisms; compliance audit reports; corrective action plans; individual and group recognition approaches; success celebrations and after-action review.

The Pritchett Change Management Curriculum & our Organization Change Management Process focus on building Human Capabilities to deliver Results



Figure 7

CHANGE JOURNEY - WRENCHING AND DISCONTINUOUS

Change is complex, intellectually wrenching and more so, discontinuous as shown in Figure 8. When change happens, there are typically three different groups of reactions we will see.

There are individuals who, when they hear about some new change, their first response is to see how they can make that change work, or even how they can make it better. Their response is about moving with the change.

These we usually call "Change Agents" - the Change by Design group. Then there are always those who, when they hear about a change, their first reaction is to talk about why it won't work, why it's the wrong thing to do, why the present way is much better, and so on. These we call "Resisters" - or the Change by Defiance group.

Then there's a group of people who are undecided. They are not sure if the change is something they are for or are against. They focus on doing their current job the current way, but are influenced to align with whichever group they feel is right or knows the best way to go.

These are the "Fence-Sitters" - the Change by Default group.

Interestingly, in a typical organisation, you'll find there are usually 20% Change Agents, 30% Resisters and 50% Fence-Sitters. Fence-Sitters are most likely to be swayed by the 30% Resisters rather than the 20% Change Agents.

As managers tasked with leading people through change, it's always helpful to challenge ourselves with the question: "Am I leading change, or am I leading resistance to change."





COMMUNICATING THE CHANGE

Meet the challenges of change with this results-oriented course that helps managers balance the need to focus on personal issues with the activities required to manage a business and maintain productivity. Pritchett Methodology equips managers and employees with the tools they need to manage the critical priorities during change-communication, productivity, and resistance. During the course, individuals learn the following:

- · Recognise the predictable dynamics of change;
- Acquire tools for managing the challenges of change around communication, productivity, and resistance;
- Identify and capitalise on individual "change management strengths" flexibility, innovativeness, risk tolerance, stress tolerance; and
- Understand the importance to create positive energy and emotion in the team.

In this regard, face-to-face communication brings its own unique challenges. We need to know what has highest impact in face-to-face communication - words, tone, or non-verbal communication? Much research has been done on this. One of the expert findings was made by Albert Mehrabian, Professor Emeritus of Psychology at UCLA. This reveals that, when we are communicating face-to-face about things such as feelings and attitudes, non-verbal communication accounts for 55% of the impact, tone accounts for 38% of the impact, and words account for only 7% of the impact.

LEARNING FOCUS

In the Pritchett programme, change management implementation learning occurs at all levels pertaining to leadership quality, planning the transformation agenda, managing the transition and alignment of capabilities, as shown in Figure 9. Specifically, the learning entails leadership capacity and capabilities, conceptualisation to execution, competency in change management and coherence and alignment to organisational reason for existence.

Rey tearning focus areas in teacing and havigating complex change tearning modules			
Key areas to address in organisations	Learning Focus		
Leadership qualities needed in terms of the capacity and capability requirements to lead and navigate the organization from the current state to its desired future state	Leadership capacity and capabilities are critical enablers needed to ensure the organization chart the correct strategic path, define the desired future state and make the transition a success		
Planning the Transformation agenda ie identifying the strategic inflection point for the organization, envisioning the desired future state, understand gaps in execution between the current and the future capabilities	Focus on the steps from conceptualization to execution to deliver results require knowledge on organizational readiness in mobilizing commitment from stakeholders and effective communication		
Managing the transition from current state to the future state and the applicable 'methodology and tools' at every stage are critical to ensure the Change management journey is a success eg overcoming resistances,	Competency in Change Management ensures that a leader has the prerequisite knowledge to demonstrate effective leadership in navigating complex change and deliver results		
Alignment of capabilities - impact of each strategic initiatives on staff, structure, system, style, skill, shared values	Implications on key levers that require alignments to ensure the entire processes of the organisations are coherent and function effectively ie Human Capital, processes, system, values, communication, performance		
Communications and getting the buy-in	Mobilising support and commitment from the various stakeholders		

Figure 9

MAKING THE TRANSITION

Managing the change dynamics is intellectually wrenching. As outlined in Figure 10, making a successful transition through a change management agenda upfront requires leadership qualities and execution excellence. However, the transition is considered successful if and only if adding value and sustainable results are fully realised as envisaged. Like in any other programme, the implementation of change management programme requires appropriate resource allocation and appropriation, besides institutional and leadership support and commitment. As depicted in the Figure 10 in the Pritchett Change Management methodology, two broad implementation strategies have been outlined; one is setting the agenda and the other is system and capabilities alignment. Structure, system and skills are imperative elements in setting the change agenda. Similarly, style, staff and more so, shared values are critical for system and capabilities alignment.



Figure 10

WINNING ORGANISATIONS ARE TEACHING ORGANISATIONS

Winning organisations have three important traits; first treating people like teammates rather than employees; second, creating opportunities for conversation and third, paying close attention. No one wants to simply be a corporate drone. Viewing an individual by what they do fails to take into account many attributes and talents that an individual can contribute to creating a winning team. By engaging others as partners in the success of an organisation shows that you value people for who they are and not just by the results that they produce. It also fosters a stronger sense of interdependency and encourages everyone to share new ideas. It is simply because people really want to be appreciated and yearn for recognition that they are an important part of a team and they want a team that they can be proud of. It is also equally imperative to take time to engage in meaningful conversations with all of your team members, rather than announcing directives or emailing orders. The purpose of such engagement with employees is gathering feedback continuously by effectively listening to the needs and ideas of those one leads. In other words, in executing the change management initiative, developing listening as a skill is critical in order to understand and learn. When it comes to making a difference in the lives of the people you lead, little things mean a lot. Thanking people for their hard work, looking them in the eye, and remembering names can have a huge impact. It shows that you genuinely care. Furthermore, it creates a foundation of trust, which is a pre-requisite for people's willingness to go above and beyond.

As depicted in Figure 11, winning organisations are teaching organisations that incorporate the four elements, as follows:

- Ideas Great companies are built on central ideas and importantly, teaching others how to develop good ideas. Also leaders create organisations that arre finely tuned in delivering success;
- Edge Leadership is about making yes-no decisions on business and people's matters; and
- Energy Leaders always motivate and energise others about change and transition;
- Values Winning leaders always articulate values explicitly and shape values that can support.



Figure 11

GREATER IMPERATIVE FOR CHANGE MANAGEMENT IN THE DIGITAL AGE

Change in the Digital Age is rapid and transformative as cited by a Facebook posting (shown below) which points to the spread, pervasiveness, ubiquity, size, speed, intensity and unpredictability of upheavals brought about in the current digital age:

- world's largest taxi company owns no taxi (Uber);
- largest accommodation provider owns no real estate (Airbnb);
- largest phone companies own no telco infrastructure (Skype, WeChat);
- world's most valuable retailer has no inventory (Alibaba);
- most popular media owner creates no content (Facebook);
- fastest growing banks have no actual money (SocietyOne);
- world's largest movie house owns no cinemas (NetFlix); and
- largest software vendors don't write the applications (Apple & Google).

"Whether there are ten forces flattening the world or seven drivers of a borderless business environment or five mega trends, the fact remains that the challenge of change is here to stay and is only going to get more daunting. Consequently, the costs of being late with change can be not just inconvenient, but devastating. We don't have to look far to see the consequences of not meeting this challenge. AT&T, GM, Kodak and Xerox in the US; ABB, Airbus and De Beers in Europe; and Mitsubishi and Sony in Japan are just few examples of companies that faltered, brought in new leaders to champion change, and still failed to recover. Any of these companies may yet recover and revitalize just as IBM or Nissan. However, the costs of recovering from crisis in terms of lost shareholder value, reputation and jobs for employees are inevitably higher than if the companies and their leaders had met the challenge of change earlier."

"Frustrating but inescapable fact of the matter seems to be that no matter how good we have been leading change in the past, the future will demand even more of us. In other words, past success is not a good predictor of future performance when it comes to leading change."

"The change might involve: transforming a business unit in the light of new technological prowess or leading an organization from domestic competition onto the global or accelerating growth by focusing not just on building things but also after sales support or changing work culture or re-designing jobs incorporating new technology that we hardly understand."

Excerpts from "The Challenge of Leading Strategic Change" by J. Stewart Black and Hal B. Gergesan published in PEARSON FT Press (2008)

Given such a scenario, it is pertinent to point out that many organisations have still not embraced change management practices as an integral part of strategic thinking. In their case, these organisations have adequate resources to implement change management on an ad hoc basis, whenever the need arises. In the industrial setting when a factory or plant is relocated elsewhere, the need for change management is increasingly needed to manage people issues.

In the digital age, many things are undergoing dramatic changes, affecting bottom line profits, jobs and the morale of the employees. Governments are also under going structural and institutional changes due to impact of changes in the digital age. The other thing, as cited in the Facebook posting, is that even the layman is increasingly aware and more so, concerned about drastic changes taking place in businesses. In other words, the imperative is great for change management practices in the digital age!

Indeed, Change Management practices can be considered to be at a crossroads and may requiring reinvention going forward. It may be necessary to explore new online courses, additions to curriculum and introduction of certification programmes for Change Management in the Digital Age.

CONCLUSION

In essence the change management leadership can be guided by a number of principles, surmised as follows:

- Systematic and organised approach imperative;
- Organisational Leadership Commitment;
- Organisation wide implementation from top to bottom;
- Programme relevance and justification;
- Sense of Ownership;
- Communication is key;
- Understanding demographics and cultural landscape;
- Address culture explicitly;
- Risk Assessment; and
- Speak to the individual.

CHAPTER 07:

Sustainability Leadership Begins with the Prevention Of Greenwashing

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DEFINING GREENWASH

The Oxford English Dictionary defines greenwash as "disinformation disseminated by an organisation so as to present an environmentally-responsible public image." This writer's view of greenwashing is that it is the act of deceptively promoting the perception that an organisation's policies and strategies are environment-friendly. Simply put, if you are giving the impression that you are more environment-friendly than you really are, that's greenwash.

What are the origins of the term greenwash? In the 1980's an American environmentalist named Jay Westerveld read a card in a hotel room that had the following words: "Save Our Planet: Every day, millions of gallons of water are used to wash towels that have



only been used once. You make the choice: A towel on the rack means, 'I will use again.' A towel on the floor means, 'Please replace.' Thank you for helping us conserve the Earth's vital resources." The card was adorned with the three green arrows that make up the recycling symbol. Westerveld saw insincerity in the "save the towel" movement, since hotels waste resources in countless different ways - and not washing as many linen pieces saves the company money. He put his thoughts together in a 1986 essay and coined the phrase "greenwashing" in the process.

IDENTIFYING GREENWASHING

The UK Guide to Greenwash published by Futerra Sustainability Communications outlines 10 signs of greenwash based on international codes and research. They are:

- Fluffy Language: Words or terms with no clear meaning; an example is 'eco-friendly';
- Green Products vs Dirty Companies: Such as efficient light bulbs made in a factory that pollutes the rivers;
- Suggestive Pictures: Green images that indicate a (unjustified) green impact e.g. flowers blooming from exhaust pipes;
- Irrelevant Claims: Emphasising one tiny green attribute when everything else is un-green;
- Best in Class?: Declaring you are slightly greener than the rest, even if the rest are pretty terrible;
- Just not Credible: 'Eco friendly' cigarettes anyone? 'Greening' a dangerous product doesn't make it safe;
- Gobbledygook: Jargon and information that only a scientist could check or understand;
- Imaginary Friends: A 'label' that looks like third party endorsement, except it's made up;
- No Proof: It could be right, but where's the evidence?; and
- Out-right Lying: Totally fabricated claims or data.

MOTIVATION FOR GREENWASHING

The following are primary reasons behind the undesirable growing global trend of greenwashing.

- End user demand for more environment-friendly products is on the rise;
- Sales of environment-oriented products is greater than before;
- Demand for green products remains robust in spite of the economic downturn;
- Regulation and government action is pending; and
- There are no industry wide standards for communicating environmental messages.

NEGATIVE EFFECTS OF GREENWASHING

The escalating occurrence of greenwashing can have deep negative effect on consumer confidence in green products, eroding the consumer market for green products and services. Similarly, greenwashing can negatively impinge on investor confidence in environment-friendly firms, eroding the socially-responsible investing capital market. Greenwashing also involves some risks for greenwashing firms when consumers, non-government organisations (NGOs) or government entities question firms' claims.

STANDARDS FOR PREVENTING GREENWASHING

The rising global tendency in greenwashing claims and the mounting demand for tighter government oversight has caused many countries around the world to mull over, develop and execute suitable regulatory procedures to battle this trend. While some countries use the International Standard on Environmental Claims ISO 14001, others such as Canada, Australia and England have developed their own set of guidelines.

As part of the ISO 14000 series of environmental management standards, the ISO 14020 series deals specifically with aspects of environmental labels and declarations. There are three main types of labeling under this standard:

- Type I: The "classic" ecolabelling schemes, which award a mark or a logo based on the fulfillment of a set of criteria. ISO 14024 provides the requirements for operating an ecolabelling scheme, like the Nordic Swan or the Japanese Eco-Mark. The standard has been adopted as a benchmark by the Global Ecolabelling Network (GEN), the international federation of ecolabelling bodies. It provides the rules to overcome some of the past criticisms of ecolabelling and provides guidance for new schemes under development.
- Type II: Claims which were made by manufacturers and businesses, and could be seen as being "self-declared". ISO 14021:1999 is the International Standard that deals with so-called self-declared claims. It states that the overall goal of environmental labels and declarations is, through the communication of verifiable, accurate information that is not misleading, to encourage the demand for, and supply of, products which cause less stress on the environment, thereby stimulating the potential for market-driven, continual environmental improvement.
- Type III: A formalised set of environmental data describing the environmental aspects of a product. ISO 14025 establishes principles and specifies procedures for issuing quantified environmental information about products, based on life-cycle data referred to as environmental declarations. A Type III environmental declaration can be described as: quantified environmental data for a product with pre-set categories of parameters based on the ISO 14040 series of standards, but not excluding additional environmental information.

ISO/TC 207, Environmental management Origins

ISO technical committee ISO/TC 207. Environmental management, is responsible for developing and maintaining the ISO 14000 family of standards. The committee's current portfolio consists of 2I published International Standards and other types of normative document, with another nine new or revised documents in preparation. ISO/TC 207 was established in 1993, as a result of ISO's commitment to respond to the complex challenge of "sustainable development" articulated at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro. It also stemmed from an intensive consultation process, carried out within the framework of the ISO Strategic Advisory Group on Environment (SAGE). SAGE was established in 1991 and brought together representatives of a variety of countries and international organizations - a total of more than 100 environmental experts

- who helped to define how International Standards could support better environmental management. As a result, the ISO I4000 family of standards for environmental management was launched to provide a practical toolbox to assist in the implementation of actions supportive to sustainable development.

From its beginning, it was recognized that ISO/TC 207 should cooperate closely with ISO/TC I76,– the ISO technical committee. Successful steps have been taken to ensure compatibility of the ISO I400I and ISO 900I standards to facilitate their use by organisations that wish to implement both environmental and quality management systems to benefit themselves and their customers and stakeholders. These steps include a common standard (ISO I90II) giving guidelines for auditing environmental and/or quality management systems.

CURRENT INTERNATIONAL REGULATIONS

The Federal Trade Commission (FTC) is the U.S. governmental agency responsible for enforcing federal consumer protection laws that prevent fraud, deception, and unfair trade practices under Section 5 of the FTC Act. The FTC has the power to prosecute false or misleading advertising claims, including environmental or "green" marketing claims.

In October 2010, the FTC issued proposed revisions to its Part 260 - Guides for the Use



of Environmental Marketing Claims, popularly known as the "Green Guides." These were first issued in 1992 and last updated in 1998. The FTC's latest proposals are aimed at bringing the Guides into the 21st century and to respond to the realities of the modern marketplace. They are designed to provide guidance on how companies can avoid misleading consumers when marketing the "greenness" of products or services.

Under the patronage of Norway's Marketing Control Act, the Norwegian Consumer Ombudsman has the power to issue warnings to automobile manufacturers who untruly advertise their cars as "green" or "environmental-friendly," "natural" or "clean."

Overview of the ISO 14000 family of standards

In consultation with ISO/TCI76 – technical committee responsible for the ISO 9000 family of quality management standards in the areas of management systems, auditing and related terminology, more so compatibility of the ISO I400I and ISO 900I standards, the ISOI4000 family of standards were arrived at. The document got it finalised in consultation with global participation of representatives from developed and developing countries. The published standards are as follows:-

 ISO 14001 is the world's most recognised framework for environmental management systems (EMS) – implemented from Argentina to Zimbabwe – that helps organisations both to manage better the impact of their activities on the environment and to demonstrate sound environmental management. ISO 14001 has been adopted as a national standard by more than half of the I60 national members of ISO and its use is encouraged by governments around the world. Although certification of conformity to the standard is not a requirement of ISO I400I, at the end of 2007, at least I54 572 certificates had been issued in I48 countries and economies.

- Other environmental management tools developed by ISO/TC 207 include: ISO I4004, which complements ISO I400I by providing additional guidance and useful explanations. Environmental audits are important tools for assessing whether an EMS is properly implemented and maintained. The auditing standard, ISO I90II, is equally useful for EMS and quality management system audits. It provides guidance on principles of auditing, managing audit programmes, the conduct of audits and on the competence of auditors.
- **ISO 14031** provides guidance on how an organisation can evaluate its environmental performance. The standard also addresses the

Canada's Competition Bureau in partnership with the Canadian Standards Association discourages businesses from making "vague claims" regarding the environmental impact of their products. Claims must be backed up by "readily available data."

Australia's Competition and Consumer Act of 2010 provides for punishment of companies that use misleading environmental claims. Organisations that are found guilty under the act could face up to \$1.1 million in fines and must pay for all expenses incurred while setting the record straight regarding their product's actual environmental impact. Australia's published guide, "Green Marketing and Trade Practices Act," warns businesses that substantiating green claims is not only good practice but it's the law, and cautions against attempts to mislead or deceive consumers which can carry serious penalties.

Section 49 of the British Code of Advertising, Sales Promotion and Direct Marketing explicitly focuses on environmental claims. England's guidance on advertising green claims directs companies on how to avoid misleading environmental claims. England's Advertising Standards Authority can proactively investigate a potentially bogus claim based on public complaints regarding dubious marketing practices.

France builds on the work of the "Bureau de Verification de la Publicité," which became a moral but not legal arbiter on green claims in 1998, French authorities launched the "Charte d'engagement et d'objectifs pour une publicité eco-responsible." Led by a jury of advertising professionals, the Charte enables the authorities to impose fines and enforce the withdrawal of environmentally misleading campaigns.
selection of suitable performance indicators, so that performance can be assessed against criteria set by management. This information can be used as a basis for internal and external reporting on environmental performance.

- Communication on the environmental aspects of products and services is an important way to use market forces to influence environmental improvement. Truthfuland accurate information provides the basis on which consumers can make informed purchasing decisions.
- **The ISO 14020** series of standards addresses a range of different approaches to environmental labels and declarations, including eco-labels (seals of approval), self-declared environmental claims, and quantified environmental information about products and services.
- **ISO 14001** addresses not only the environmental aspects of an organization's processes, but also those of its products and services. Therefore ISO/TC 207 has developed additional tools to

assist in addressing such aspects. Life-cycle assessment (LCA) is a tool for identifying and evaluating the environmental aspects of products and services from the "cradle to the grave": from the extraction of resource inputs to the eventual disposal of the product or its waste. The ISO I4040 standards give guidelines on the principles and conduct of LCA studies that provide an organisation with information on how to reduce the overall environmental impact of its products and services.

- **ISO 14064 parts I, 2 and 3** are international greenhouse gas (GHG) accounting and verification standards which provide a set of clear and verifiable requirements to support organisations and proponents of GHG emission reduction projects.
- ISO 14065 complements ISO 14064 by specifying requirements to accredit or recognise organisational bodies that undertake GHG validation or verification using ISO 14064 or



A REGULATORY FRAMEWORK PRIMER

A regulatory framework consists of laws and regulations that outline the legal requirements to be met. They may also be complemented by policies, standards, directives and guidelines.

Legislation is a directive positioned by a government or governing body on either an industry, a section of community or placed on people of a country which must be complied with in order to remain within the legal boundaries of that particular country, community or industry. In industry, legislation acts as an external driver which must be met by all players in order to be compliant. Legislation is passed as laws by a parliament of a country or some other legislative arm of a government.

other relevant standards or specifications.

• **ISO 14063,** on environmental communication guidelines and examples, helps companies to make the important link to external stakeholders.

Environmental and economic benefits

Although the ISO I4000 standards are designed to be mutually supportive, they can also be used independently of each other to achieve environmental goals. The whole ISO I4000 family of standards provides management tools for organisations to manage their environmental aspects and assess their environmental performance. Together, these tools can provide significant tangible economic benefits, including the following:

- Reduced raw material/resource use;
- Reduced energy consumption;

- Improved process efficiency;
- Reduced waste generation and disposal costs;
- Utilization of recoverable resources.

Of course, associated with each of these economic benefits are distinct environmental benefits too. This is the contribution that the ISO 14000 series makes to the environmental and economic components of sustainable development and the triple bottom line.

Source:

Web sites ISO : www.iso.org ISO/TC 207 : www.tc207.org Information on the ISO I4000 standards is also available from ISO's national member bodies:www.iso.org/isomembers And from the ISO Web site – www.iso.org/managementstandards

After legislation is passed, there will be regulators, usually government bodies, who will examine the laws passed and work out the details that need to be enforced so that they are followed. A regulation refers to a specific requirement that can take on various forms, such as industry specific regulation or regulations that are much broader in scope. They are basically the way the legislation is enforced by regulators and they support the requirements of the legislation. In industry, they specify the particular formal (legal) requirements that need to be followed by organizations, workers and employers alike so as to create a level playing field within the competitive environment of the organizations as well as within a particular organisation.

Regulatory documents include legislative documents, directives, decisions, and other documents that all have a legal value.

A REGULATORY FRAMEWORK FOR MALAYSIA TO PREVENT GREENWASHING

Acomprehensive regulatory framework for preventing greenwashing is seen as being indispensable as the country moves towards a low carbon economy in the coming years. The global consumer and capital markets for green products, services and firms have been expanding rapidly in the last decade and Malaysia has established itself as a forerunner in the field.

More companies are now communicating about the greenness of their products and practices in order to reap the benefits of these expanding green markets. Green advertising has increased almost tenfold in the last 20 years and nearly tripled since 2006. As of 2009, more than 75 percent of S&P 500 companies had website sections dedicated to disclosing their environmental and social policies and performance. At the same time, more and more firms are engaging in greenwashing, misleading consumers about firm environmental performance or the environmental benefits of a product or service. Over 95 percent of products surveyed by TerraChoice in 2008/2009 committed at least one of the TerraChoice "Seven Sins of Greenwashing."

CONCLUSION

As such, I am putting forth a recommendation to the Malaysian government to kick start Malaysia's anti-greenwashing regulatory framework development. In that spirit, I appeal to companies to stop portraying baby steps on the environment as giant strides. We need more than "little bits" to solve global warming, halt deforestation, prevent the destruction of the oceans, and end the proliferation of toxic chemicals. Given that half-measures are sold as full solutions, corporate actions, no matter how genuine, will be nothing more than a more classy form of greenwashing.

CHAPTER 08:

Smart Governance towards Changing the Landscape of the Malaysian Public Sector

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INTRODUCTION

Among the many promises of governments is to continuously improve their service delivery by transforming the way they do their day-to-day business. There is also growing demand for governments to transform from a traditional agency and department-centric model to a "Citizen-Centric" model [1, 6, 9]. Such a transformation is expected to enhance the quality of life of citizens in terms of greater convenience in availing government services [1, 2, 3, 8, 19, 20] and thereby, result in increased customer satisfaction levels and trust in government [5, 7, 16, 21]. The advent of information and communication technologies (ICT) comes with the potential to modernise government organisations, strengthen their effectiveness and make them more responsive to the needs of their citizens [1, 2]. Government agencies are increasingly embracing ICT to boost efficiency and integrate employees, partners and citizens in a seamless manner [14, 21]. Many countries have taken this opportunity to adopt and deploy ICT by introducing e-Government programmes to transform several dimensions of their operations, to create more accessible, transparent, effective, and accountable government [4, 15].

Malaysia has followed the global trend and adopted e-government in order to improve governance and service delivery on the one hand, and to foster national developmental goals on the other. Although Malaysia's journey towards a 'knowledge economy' began with the unveiling of the Vision 2020 in 1991, it was the establishment of the Multimedia Super Corridor (MSC) in 1996 that spurred ICT adoption in the country. Concerted efforts have been made to support the nation's transition from a production based-economy to a knowledge-based economy, thereby leapfrog development using ICT as the enabler [10, 11]. E-Government is among the leading flagship projects the MSC has promoted with twin objectives - to reinvent the government in terms of its service delivery through the use of ICT and to catalyse the successful development of MSC with ICT as the leading sector of the economy. Relevant government documents have outlined the vision of e-Government which requires the government, businesses and citizens to work together for the benefit of the country and all its citizens. This vision underscores the need for creating a collaborative environment that fosters the development of the new technology. It also calls for reinventing the government using ICT and multimedia so as to make the government agencies efficient, effective and consequently more responsive to the needs of the citizens [11, 12, 13].

In 2009, the Malaysian government launched a new initiative i.e. Government Transformation Programme (GTP) which seeks to improve the role of government administration holistically in assisting the achievement of Vision 2020 i.e. making Malaysia a high-income developed nation. In this regards, the GTP and e-Government project are seen to complement each other with same objectives i.e. transform the government machinery to be more transparent and accountable, thus resulting in being more efficient and effective.

This paper will examine the success of these projects and tries to establish smart governance between them in order to change the landscape of the Malaysian public sector towards being more accountable and transparent.

I. GOVERNMENT TRANSFORMATION PROGRAMME

Malaysia has reached a defining moment in its development path. Vision 2020 is not possible without economic, social and government transformation. To move the country forward, the government has crafted a framework comprising four pillars to drive change, namely the 1Malaysia Agenda, the Economic Transformation Programme (ETP), the Government Transformation Programme (GTP) and the Tenth Malaysian Plan (10th MP) as shown in Figure 1



Figure 1: Government Transformation Programme

The objective of the GTP is two-fold - first, to transform the Government to be more effective in its delivery of services and accountable for outcomes that matter most to the citizens; and second, to move Malaysia forward to become an advanced, united, and just society with high standards of living for all. This is in line with the national mission of achieving Vision 2020 - for Malaysia to become a fully developed nation [17, 18]. The six National Key Result Areas (NKRAs) identified to spearhead the Government's transformation are:

- Reducing crime
- Fighting corruption
- Improving student outcomes
- Raising living standards of low-income households
- Improving rural basic infrastructure
- Improving urban public transport

The underlying rationale for the GTP and thus this roadmap is that the Government needs a new way of doing things to both accelerate and sustain impact. Essentially, the government

want to deliver substantial results more quickly. In taking on this much needed transformation, the government realise that the citizen are impatient for results, that resources are limited, that new ideas are necessary and that they do not always have all the answers. Prioritisation is inevitable, but a new way of tackling transformation itself is also necessary. True transformation requires a fundamental change to the way things are done in an organisation, and through this new way of acting, the character of the organisation is changed. The methodology or transformation engine that will use now, begins with a quick call for the best ideas, and then rapidly moves to action.

"It is our belief and experience that we learn best from doing, rather than simply planning, similar to learning to ride a bicycle. Watching Lance Armstrong might show you how to balance on the seat of a bicycle and take corners effectively. However, it is only by getting on a bicycle and pedalling, and then improving our actions each time we fall, that we actually learn, equip ourselves with new ways of doing things, and over time become better cyclists. With our transformation engine, we rapidly take ideas to doing, assessing the impact of our initial actions, and then rapidly implement enhancements. In this way, we will both immediately make a difference, and we will learn, very practically, what is required to ensure implementation success. We will also build new capabilities in doing things differently that will allow us to sustainably improve performance, as the citizen demand and deserve" (Malaysian Prime Minister, 2009)

We realise that we cannot use the same approach as before to transform our government and achieve substantial results quickly. Therefore, we are approaching government transformation in a radical new way, while still leveraging the successes and lessons from the past and from government transformation efforts in other countries. This radical new way embraces six elements:

- Institutionalising a new way of working (e.g., Labs, Work camps) including an approach or 'engine' focused on doing and then improving, instead of just planning, and which brings the best civil servants together in cross-agency teams to develop detailed solutions
- Proactively gathering input and feedback from the citizen e.g., through Open Days, surveys, the internet and SMS
- Publishing this roadmap, effectively a performance contract between the Government and the citizen, that fully commits us to delivery, by transparently outlining concrete targets and plans
- Instituting 16 delivery principles to guide how we will deliver differently. These have literally been signed off by the Cabinet and are now being applied in day to- day delivery
- Establishing PEMANDU, a new hybrid organisation which draws talent from both the public and private sectors, to act as catalyst for transformation and to help ministries deliver on their priorities
- Publishing an annual report that will transparently and objectively tell the citizen what the Government has and has not yet delivered and how the programme will be improved over time

GTP is a single blueprint that has been divided into three distinct horizons each with their own focal points. Each horizon aims to build on the achievements of the preceding one by introducing greater and deeper change [17, 18].

I.I GTP I.0: THE FIRST HORIZON

The first horizon of the GTP kicked off in 2010 following the identification of the National and Ministerial Key Results Areas (NKRAs and MKRAs). As the curtain-raiser for the GTP as a whole, the immediate goal of GTP 1.0 was to arrest the decline in the NKRAs and to sow the seeds of mentality-change that would lay the foundation for the remainder of the transformation programme. GTP 1.0 also played an important role in helping the Government gauge the effectiveness of its targeted approach, and to help better understand how to best meet the overall targets of the GTP. Quantifiable National Key Performance Indicators (NKPIs) of GTP 1.0, i.e. the targets of each NKRA, were introduced to help gauge the success of each individual initiative thereby providing real and measurable standards from which to judge the success of each respective horizon.

1.2 GTP 2.0: ENHANCING CHANGE

By almost all accounts, the GTP 1.0 'pilot' programme has been a stellar success judging from its results achieved. GTP 2.0, which formally kicks off in 2013, aims to further deepen and enhance the transformative initiatives initiated in the first phase. GTP 2.0 expands and enhances GTP 1.0 initiatives that have proven to be effective, and introduces new initiatives that further expand the nexus of change.

1.3 GTP 3.0: TO THE FUTURE AND BEYOND

Finally, the last phase of the GTP, which will run from 2015 to 2020, will leverage on the changes brought about by the two previous horizons to establish new innovative governance structures that are citizen-centred. These structures will thus support other economic activities that will take Malaysia to developed nation status. The gradual change in focus of the GTP is a necessary part of this transformation process as it allows for each respective stakeholder to build a proper foundation each step of the way. Measures are also simultaneously evaluated to determine their efficacy and re-strategized to cope with new challenges or changing parameters.

GTP is supported by various governments programs and policies like e-Government, the Economic Transformation Plan (ETP) and the Tenth Malaysian Plan. ETP is a comprehensive effort that will transform Malaysia into a high-income nation by 2020. It will lift Malaysia's gross national income (GNI) per capita from USD6,700 or RM23,700 in 2009 to more than USD15,000 or RM48,000 in 2020, propelling the nation to the level of other high income nations. This GNI growth of six per cent per annum will allow us to achieve the targets set under Vision 2020. It is based on the smart partnership between the private sector and government (B2G) where private sector will be the engine of economic growth while government will play the role facilitator to support the agenda. In addition, the 10th MP is built on five key strategic thrusts:

- Creating the environment for unleashing economic growth. Strategies to create an environment that fosters economic growth with private sector as main driver.
- Transforming government to transform Malaysia. The role of government will evolve to become an effective facilitator in the transformation of the economy and provide quality services to the "citizen". (ie citizens)

- Moving towards inclusive socio-economic development. Measures to ensure income and wealth are distributed in equitable manner.
- Developing and retaining a First-World talent base. Key to promote productivity and innovation-led growth. Strategies to develop, attract and retain quality talent base
- Building an environment that enhances quality of life. Economic growth will be supplemented by strategies to raise the quality of life of the "citizen" that commensurate with the country's higher income status.

2. E-GOVERNMENT DEVELOPMENT IN MALAYSIA (1996-2013)

Malaysia has followed the global trend and adopted e-Government in order to improve governance and service delivery on the one hand and to foster national developmental goals on the other. Although Malaysia's journey towards 'knowledge economy' began with the unveiling of the Vision 2020 in 1991, it was the establishment of Multimedia Super Corridor (MSC) in 1996 that spurred the ICT adoption in the country. Concerted efforts have been made ever since seeking to support the nation's transition from production based-economy to a knowledgebased economy thereby leapfrog development using ICT as the enabler.

E-Government is among the leading flagship projects the MSC has promoted with twin objectives i.e. to reinvent the government in terms of its service delivery through the use of ICT and to catalyse the successful development of MSC with ICT as the leading sector of the economy. Relevant government documents have outlined the vision of e-government which requires the government, businesses and citizens to work together for the benefit of the country and all its citizens. This vision underscores the need for creating a collaborative environment that fosters the development of the new technology. It also calls for reinventing the government using ICT and multimedia so as to make the government agencies efficient, effective and consequently more responsive to the needs of the citizens [11, 12, 13].

Since the early years, e-Government in Malaysia has come to be seen as a key component of governmental strategy for achieving the national developmental goals. While such goals capture some essential elements of Millennium Development Goals (MDGs) and Malaysia has already recorded significant gains in a number of MGD areas, challenges in other fields have made the task extremely critical for Malaysia to achieve a fully developed country status by 2020. In view of this, the Malaysian government has redoubled it efforts by initiating and implementing e-Government programs and projects, alongside other policies and projects. As a result, the type and number of e-Government projects have grown steadily with variety of services made 2 available electronically. All this has helped improve Malaysia's profile in global e-government ranking. More importantly, governmental initiatives have produced significant innovations in various spheres [10, 19, 20].

Successfully realizing the vision for e-Government means fundamentally changing how government operates and implies a new set of responsibilities for public servants, businesses and citizens. The new services, information and channel for government to interact with the different constituencies will require all parties to become familiar with new technologies and develop new skills. The landscape of the e-Government applications as follows (Figure 2):





There are seven projects launched to date under the e-Government Flagship since it was started in 1997. All this projects will use ICT and multimedia technologies to transform the way the government operates, coordination and enforcement (MAMPU, 1997). Table 1 summarises the projects and its characteristics.

Projects	Characteristics
Generic Office Environment (GOE)	provides a new paradigm of working in a collaborative environment where government agencies communicate, interact and share information
Electronic Procurement (EP)	Links the government and suppliers in an online environment. Government agencies as buyers procure goods/services by browsing catalogues advertised by suppliers. Aimed at best value for money, timely and accurate payment
Project Monitoring System (PMS)	Provides a new mechanism for monitoring implementation of development projects, incorporating operational and managerial functions, and knowledge repository
Human Resource Management Information System (HRMIS)	Provides a single interface for government employees to perform HRD functions effectively and efficiently in an integrated environment.
Electronic Services (e-Services)	Enables direct, online transactions between the public, the government and large service providers via electronic means
Electronic Labour Exchange (ELX)	A one-stop-centre for labor market information, accessible to government agencies, the business sector and the citizens.
E-Syariah	Introduces administrative reforms that upgrade the quality of services in Syariah courts. To enhance the Islamic Affairs Department's effectiveness- better monitoring and coordination of its agencies and 102 Syariah courts.

Table 1: Main projects under the E-Government Flagship Source: MDeC (www.mdec.com.my) Back in 1996 when the e-Government initiative was first launched, the country's target was not only to reinvent the government using ICT, but also to become a pioneer e-Government that would be the benchmark for a global government. Currently, 35% of government services are available through the portal which includes allowing pensioners and senior citizens to access their various benefits online, license and permit renewals, passport renewals and local council summons payments. The government has set a target to have 90% of government services online by 2015. This means that by 2015, Malaysians will be able to carry out 90% of their transactions with government departments and agencies via the myGovernment. Government is creating an environment in which extensive application of ICT is expected to encourage communities to interact in real time. Figure 3 depicts the current scenario of e-Government implementation in Malaysia.



Figure 3: E-Government progress

3. GTP AND E-GOVERNMENT: CHANGING THE LANDSCAPE IN THE PUBLIC SECTOR

As discussed above, both the agenda i.e. GTP and e-Government aims to transform and improve the quality of public service delivery. Therefore, the main argument here would be how e-Government can complement GTP and vice-versa?

The use of e-Government will increase the accessibility, speed, and transparency of government services through communications technology. Figure 4 depicts some of the success stories in public sector management achieved via the use of e-Government activities.



Paperless Government: 90% manual

*as of April 2011

EPP8 TARGET	Transaction Mode	2 Year Average Total Transaction	2 Year Average (%)
2012: 50% online	Online	111,914,480	43
2012: 50% of total transaction online	E-Counter	92,152,027	35
2012: 90% meeting invites online	Mixed	35,375,684	14
2012: 70% letters, circulars, minutes online	Manual Counter	22,021,657	8
M	TOTAL	261,463,847	100

Figure 4: e-Government success

E-Government implementation has impacted the achievement of GTP in a very positive manner by strengthening the public sector. In this context e-Government able to:

- Improve decision-making processes
- Improve service delivery
- Reduce friction cost
- Provide a safety net to facilitate a smooth transition
- Strengthen the public finance management

Table 2 depicts some of the expected outcomes, revenues and other target that can be achieved thru this smart partnership of e-Government and GTP programmes.

Key Initiatives	Expected Outcomes	Revenues
 E-Counter Paperless Government 1MYAccount	Availability 2012- 50 % services available online 2015- 90 % services available online 2020- 90 % services available online; 10 % e-forms	Total = RM 211 million Maintenance Incremental storage Additional mobile data Info government Downloading services and e-library
	Usage 2012- 50 % total transactions online 2015- 90 % transactions online 2020- 90 % transactions online; 10 % e- forms 2011- establishment of document management system 2012- 70 % intra-agency transactions are online 2012- 90 % meetings invites online	Transaction fees Kiosk connectivity

Table 2: Key initiatives, expected outcome and revenues

4. BUSINESS PROCESS RE-ENGINEERING TOWARDS SMART GOVERNANCE

A government agency is organized to perform its functions and it is carried out by a managerial unit with responsibility for and authority over a series of related activities involving one or more entities and performed for the direct or indirect purpose of fulfilling the objectives of the government agency. For an organized government agency there will be a well-defined flow from one activity to another in order to achieve its effectiveness and efficiency. The chain from business functions to process and then to activities are the chains used in business systems analysis to analyse and create a model of a government agency. A well-organized government agency should have a set of well-defined function-process-activities chains, or systems.

The real power of e-Government is not that it can make the original, or the old, business processes work better but that it enables government agencies to break old rules and outdated assumptions and create new ways of doing the work. That process is usually called business re-engineering although other terms and names include business process redesign, business redesign and process redesign. In the case of Malaysia, both GTP and e-Government seeks to achieve this objective by doing their business more innovatively and creatively.

4.1 E-PROCUREMENT: AN EXAMPLE OF GOVERNMENT RE-ENGINEERING

An example of an e-procurement system can illustrate how re-engineering works in practice. An e-Procurement system consists of three elements: government, supplier, and e-Procurement institution. In Malaysia, e-Procurement system is one of the success stories of e-Government project and becoming value-added services with GTP implementation. Figure 5 depicts the model of e-Procurement in Malaysia. The vision of e-Procurement is to improve and ensure an effective and efficient electronic procurement management system while its mission is to make e-Procurement as a main procurement mechanism to be used by the government agencies and suppliers:

- To ensure best value for money for Government procurement
- To ensure suppliers receive faster and more accurate payment
- To ensure accountability and transparency in all Government procurement
- To increase collaboration between the business sector and the Government



Figure 5: e-Procurement Participants

The benefits of e-procurement are obvious:

- 1. It simplifies the process of government procurement and saves tremendous human and financial resources.
- 2. A fair market competition can be organized and reduced prices for goods and services can be obtained through batch procurement.
- 3. The entire procurement process of a government agency can be monitored and reported in a timely way so as to better control the budget and expenditure of the agency.
- 4. A transparent procurement process can be achieved and monitored by the public.

5. E-GOVERNMENT INNOVATIONS TO SUPPORT GTP: PROSPECTS AND CHALLENGES

The preceding discussions show that Malaysia has made considerable inroads in the transforming governance and service delivery through the implementation of e-Government and GTP programs. The variety of programs initiated and implemented has brought about considerable improvements in the way government operates its businesses internally and how it interacts with citizens and businesses. A close look at the on-going initiatives and their impacts reveals a number of promising features/ trends:

- E-government initiatives have led to a new mode of governance whereby the conventional method of service delivery is being replaced by new methods. The provisions of online services have been particularly convenient as citizens are no longer required to make transactions over service counters; it is possible to make such transactions online using Internet, multimedia kiosks and other channels. Such developments in effect indicate a shift towards people-centred government. Improved access, simplicity and convenience of clients are among the goals of e-Government initiatives.
- The integration of services offered by multiple agencies means that customers are no longer required to visit each and every agency to access services; a single agency is able to provide all these services in a more convenient and hassle-free manner. Thus the members of the public are now able to access better services that are streamlined and integrated.
- E-Government initiatives have also contributed significantly to enhance the efficiency of public agencies in terms of service delivery and variety of other benefits for citizens, businesses and the government alike [10, 19, 20]. E-Procurement scheme has not only reduced the government's procurement costs, but also made the government operations faster and steadier contributing to the satisfaction of all parties involved.
- Apart from being seen as a tool with which to improve governmental efficiency, e-Government is also viewed as a strategy that helps the government to keep pace with the demands of people and businesses in the fast changing environment. This is particularly true in Malaysia where e-Government schemes are expected to increase country's attractiveness as a location of business. Some of the e-Government projects facilitate interactions between government and businesses and assist private firms in the development of market and strategic advantage at home and abroad. Projects like e-Procurement have transformed public procurement, provided greater access to government information and contracts and allowed private businesses to do transactions with government online. Besides efficiency, transparency and timeliness e-Procurement has opened up possibilities for agencies to expand their businesses to a new level.

6. PUBLIC SECTOR ICT STRATEGIC PLAN (2011-2015)

The government has launched the National ICT Strategic Plan with the aim to strengthen the uptake of ICT in order to realize the objectives of GTP and e-Government projects. Table 3 summarises the agenda of the plan.

FIVE Programs	SIX Policy Targets
 Enhance service delivery Implement online services (myRakyat, myBusiness, myWorkforce and e-Payment) Public Sector Digital Document Management System Transport Intelligence System Information repository on crime 	 Towards zero face-to-face service delivery 2015- 90 % of all government services are available online 2015- 90% of total transactions for online services are made online
 Enhance capacity and capability Public Sector ICT Skills Framework ISMS ICT Compliance Audit Programme Public Sector ICT Specialist and 3R (Reskill, Redeploy and Replace) Programme 	 Towards paperless government 2011 - Public Sector Digital Document System establish 2012 - 70% of intra-government letters, memos, invitations, circulars and meeting minutes online 2012 - 90% of meeting invites online
 3. Enhance performance measurement Capability Public Sector Service Intelligence Performance Measurement Tool for Agencies Public Sector ICT Compliance Self-Assessment Tool 	 Inculcating information sharing and Interoperability 2012 - Development of an Information Architecture (IA) Application for one (1) citizens' touch point services. 2013 - Deployment of said service and development of an additional one (1) IA Application 2015 - Establishment of four (4) IA Applications
 4. Connected government Roll out Citizen Registry System Roll out Business Registry Development of vehicle, student and health registry Public Sector Knowledge Management Hub 	 4. Cross agency collaboration towards seamless service 2012 -Service Intelligence System establish 2015 -Transport Intelligence System, Education Intelligence System and Health Intelligence System establish
 5. Sustainable and resilient ICT Government Unified Communication Services (1UC) Government Integrated Communication Network Consolidation of Government Data Center and Government Disaster Recovery Centre Deployment of mobile solutions and applications ICT Security Compliance Scorecard Business Continuity Plan for Agencies Malaysia Public Sector Trustmark 	 5. Government shared services 2011 - Implementation of Government Integrated Telecommunication Network (1Gov*Net) 2012 - 200,000 users have access to Government Unified Communication Services (1Gov*Mail) 2012 - 20 agencies tenancy in Public Sector Consolidated Data Center (1Gov*DC)
	 6. Skills and expertise internalisation of ICT personnel in the public sector 2015 - At least 10% certified in the eight (8) ICT areas recognized by Public Service Department

Table 3: Public Sector ICT Strategic Plan (2011-2015): GTP & e-Government

Moving forward, the achievements of GTP can be complemented by e-Government initiative. The government need to address challenges faced via e-Government implementation and use GTP a strategic tool in continuously improve the government service delivery. Some of the issues that need to be addressed include:

- 1. Human capital management. The government must ensure strategic talent management process in place in order to the have the right personnel in managing the initiatives proposed.
- 2. Leadership. This is a critical component of where the leaders should continue their support for the agenda and lead by example. In the case of Malaysia, the Prime Minister chairs the e-Government and GTP meetings in ensuring that the programs are executed as planned.
- 3. Change Management and Work Culture. All the stakeholders should be aware that change management is a continuous process in upgrading the systems, the work process and flows etc. in order to be relevant.
- 4. Citizen. The ultimate client to be satisfied in both the e-Government and GTP programs will be the citizens. The government must ensure that the services provided will be able to create demand among the citizens who will ultimately benefits from it.
- 5. Smart Government. GTP and e-Government programs must not substitute each and thus create competition among them. These projects must be unique in its own but holistic and interdependent with the national goals of making the government more transparent and accountable administration.

7. RE-INVENTING PUBLIC SECTOR THROUGH DIGITAL LEADERSHIP: ELEVENTH MALAYSIA PLAN (2016-2020) PERSPECTIVE

The challenges facing governments are becoming increasingly more complex due to technological and cultural changes, demographic shifts, and the ever faster movement of money, goods and people. Governments globally are also encountering greater fiscal constraints, economic uncertainties, declining effectiveness of standard practices and procedures, as well as difficulties in attracting and retaining top talent. Increased affluence and exposure to global services has led to more sophisticated demand and rapidly rising expectations from the rakyat, further escalating challenges in public service delivery. An important part of addressing these challenges requires adapting to new models of service delivery that are better suited to today's technologies, norms and citizen needs. These new delivery and service requirements provide a clear opportunity for the Government to reform in order to be more cost-effective and better equipped to meet the demands and expectations of the rakyat for 2020 and beyond. This will also require the public sector to be leaner, facilitative, more efficient, more productive, more skilled, more open, more innovative, and less bureaucratic, in order to better deliver for the rakyat and for Malaysia.

As such, like in the past, during the Eleventh Malaysia Plan (2016-2020) the Government is committed to transforming the public service by becoming more citizen-centric and enhancing the productivity, efficiency, and effectiveness of service delivery. To achieve these aspirations the Government has identified five focus areas:

- i. Enhancing service delivery with citizens at the centre by eliminating unnecessary bureaucratic processes, expanding the outreach of its services, and increasing accountability;
- ii. Rationalising public sector institutions for greater productivity and performance by reducing overlapping roles and functions among agencies, right sizing the public service, and introducing an exit policy for underperformers;
- iii. Strengthening talent management for the public service of the future by providing a more conducive working environment including flexible work arrangements, empowering ministries and agencies, and upgrading public sector training;
- iv. Enhancing project management for better and faster results by improving the process of project selection and resource allocation, establishing dedicated project implementation teams, and creating a pool of professional project management personnel; and

v. Capitalising on local government for quality services at the local level through greater engagement with local community and NGOs, expanding the outreach and quality of service, and further empowering local authorities in terms of capacity and capability.

Towards this end, the Government in its implementation strategies has outlined enhancing public service delivery, public sector institutions reforms and capitalizing on local authority as the way forward in next five years. In the plan the Government also has identified targets for resource allocation and appropriation. Among many others, the key ones includes improving delivery processes, leveraging data, expanding outreach and increasing accountability and transparency, rightsizing of the public service, introducing exit policy for non-performers, enhancing talent management and competency building, improving project management and implementation by public sector institutions, provision of greater empowerment, more stakeholder engagement and stronger business or community partnerships. In contemporary context the strategic aspirations and more so, at tactical and implementation unequivocally there is a vital role for digital technology leadership in enhancing the public sector productivity. In its attempts to reinvent public sector reform through the digital technology leadership the 11th plan has identified a number of specific technological directions and applications, as surmised as below:-

- Proliferating open data among agencies: MAMPU will spearhead the National Open Data initiative in collaboration with the Multimedia Development Corporation (MDeC) to enable the innovative use of government data;
- Encouraging cross-agency data sharing: A cloud-based service will be set up to host public sector data and online applications in the Government Data Centre (GDC).
- Developing public sector cloud computing infrastructure: The public sector cloud computing
 infrastructure is a dedicated cloud to host government applications and data. This involves
 deploying groups of remote servers and software networks that allow centralised data
 storage and online access to computer services or resources. The cloud will be a one-stop
 centre for public sector agencies to have access to various cloud services namely, Software
 as a Service, Platform as a Service, and Infrastructure as a Service;
- Leveraging big data analytics: The BDA Blueprint for the public sector will be formulated, which will encompass governance mechanisms, communication plan and capability building. The implementation of BDA will utilise existing government infrastructure such as 1Gov*Net and GDC. The usage of BDA will facilitate decision-making based on comprehensive data made available from within and outside of the agency.;
- Increasing usage of online services: The Government will continue to expand and strengthen its online service offerings for greater accessibility and convenience for the rakyat.
- Maximising the usage of Urban Transformation Centres, Rural Transformation Centres and Mobile Community Transformation Centres Services: From Mobile Community Transformation Centres (Mobile CTCs) will be expanded and strengthened by consolidating different services into one facility. This will allow frontline government services, which include MyKad registration, driving licence renewal, and business advisory services, to be made available to the underserved.
- Enhancing citizen engagement in identification of issues and creative solutions: A community engagement framework will be established to enable the co-creation of public sector solutions where frontline agencies gather feedback through crowdsourcing platforms. The framework will provide opportunities, including online, for the public to contribute to the process of identifying issues and creative solutions to improve services.

Specifically, the Government is promulgating cloud implementation in lieu of realizing the following benefits.

- Cost reduction resources such as software, storage and processing power are pooled and shared to serve multiple agencies;
- Strengthened security incorporate data security with adequate access controls to manage usage of sensitive data;
- Universal access cloud mobility enabling access from any place at any time;
- Faster deployment enable agencies to run their applications faster as a result of improved manageability and lower maintenance requirements; and
- Ease of collaboration allow real time collaboration where documents are stored in a central location and can be accessed by multiple users.

Similarly, like private sector the Government sector is also promulgating big data analytics, at least to realise three core benefits, as follows:-

- Cost reduction Big data technologies like Hadoop and cloud-based analytics can provide substantial cost advantages. Employing big data technologies not to replace existing architectures, but to augment them, in particular rather than processing and storing vast quantities of new data in a data warehouse, for example, companies are using Hadoop clusters for that purpose, and moving data to enterprise warehouses as needed for production analytical applications.
- Faster, better decision making Timely insights from the vast amounts of data. This includes those already stored in company databases, from external third-party sources, the Internet, social media and remote sensors. More importantly, identifying significant information that can improve decision quality and mitigating risk by optimizing the complex decisions of unplanned events more rapidly
- New products and services- Perhaps the most interesting use of big data analytics is to create new products and services for customers. By virtue of inherent common characteristics of big data insights addresses speed and scalability, mobility and security, flexibility and stability, integration of both structured, semi-structured and unstructured data and extracting value from various data sources including mobile devices, radio-frequency identification (RFID), the Web and a growing list of automated sensory technologies provides the requisite basis for new products and services.

CONCLUSION

In short, while GTP and e-Government projects can support each other, the government agencies should embrace the right attitude in deploying all the proposed projects and activities in order to realize the full potential of these programs. Government should 'think big and act fast' since the country has only seven more years left to achieve its dream of becoming a high-income developed country. As stipulated, the focus areas and strategic thrusts laid down in the 11th Plan could able to accelerate the envisaged public sector reforms, with the ardent support of political will and administrative commitments.

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