COMMUNICATIONS & MULTIMEDIA BLUEPRINT
2018-2025
DIGITISE AND HUMANISE
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As Malaysia progresses steadfastly towards becoming a high-income nation, it is crucial for the nation to be more agile and responsive to the various disruptive innovations emerging in the communications and multimedia sector. Our Rakyat must continue to be innovative and always ahead of the technology curve to capitalise on the digital advantage the world presents to us.

The convergence of the Communications and Multimedia sector demands that Malaysia adapts to a rapidly changing landscape to remain competitive globally. In this context, the Communications & Multimedia Blueprint 2018-2025 is a manifestation of our ambitions to be ahead of the game. The Blueprint calls for the various stakeholders to focus on making our vision towards a people-centric communications and building a full-fledged digital nation a reality. In my view, with the dedication, commitment and relentless perseverance of all Malaysians, these aspirations can be successfully accomplished.

In building Malaysia’s future, the Rakyat must not only react nimbly to emerging technological disruptions; rather, we must sharpen our capabilities to seize the opportunities that arise, and exploit these high-impact ideas and innovations. Towards this end, I am glad that the Blueprint supports the Government’s desire to propel our nation into the ranks of Top 20 nations in the world. It highlights a clear vision and strategic imperatives that lay down comprehensive solutions for the challenges faced by the Communications and Multimedia sector.

Last but not least, I would like to thank and congratulate the Ministry of Communications & Multimedia for the hard work, commitment and diligence in formulating this far-reaching Blueprint. I am confident that this Blueprint will forge us ahead in this exciting journey towards accomplishing our very own informed digital nation.
In building Malaysia’s future, the Rakyat must not only react nimbly to emerging technological disruptions; rather we must sharpen our capabilities to seize the opportunities that arise, and exploit these high-impact ideas and innovations.

Dato’ Sri Mohd Najib Bin Tun Haji Abdul Razak
The Ministry of Communications and Multimedia has proactively formulated the Communications & Multimedia Blueprint 2018-2025 to empower and strengthen the Malaysian Communications and Multimedia sector as a leader in the region. This Blueprint, which is the culmination of a rigorous process of engagements and coordination with various ministries, government agencies and industry participants, is highly critical as we position Malaysia to become a digital nation.

This Blueprint also presents the importance of Malaysia’s continued progress in building its digital and communication capabilities in order to respond strategically to the Communications and Multimedia sector’s changing realities. Specifically, the Blueprint comprises six strategic imperatives for our transformation journey till 2025. Through these strategic imperatives, the Blueprint addresses a range of topics with a comprehensive analysis of global communications and media trends.

The wholehearted support and commitment from all stakeholders in the public and private sectors are vital to the success of this Blueprint. A robust governance and delivery structure will be established, and I look forward to the commitment of all parties to make this Blueprint a reality.

Last but not least, I would like to thank the Ministry’s Secretary General, and the management and agencies who have worked relentlessly to formulate this Blueprint.
This Blueprint also presents the importance of Malaysia’s continued progress in building its digital and communication capabilities in order to respond strategically to the communications and multimedia sector’s changing realities.
The advent of new communication technologies and social media tools has changed the manner by which people interact and communicate, as well as the way information is produced and accessed. With devices always at the ready, every person is not only a consumer but also a generator of stories and news, opinions and evaluations.

In the digital era, people get their news almost as soon as it happens and from a plethora of sources and perspectives, some credible and others less so. Multimedia structures will need to evolve and business models changed, creating a landscape that may defy regulation. This being the case, the Ministry of Communications and Multimedia Malaysia needs to be agile in order to respond proactively to the implications of disruptive innovations.

It is never easy to set and steer the direction of an entire industry, especially one that is changing as rapidly as the Communications and Multimedia sector. The Communications & Multimedia Blueprint 2018-2025 charts a new course of action that will enable the sector to navigate the future and produce the best outcomes for the nation.

This Blueprint has benefited immensely from the invaluable participation of numerous stakeholders across the Communications and Multimedia sector. I would like to express my heartiest gratitude and appreciation to all parties whose contributions have helped to develop this Blueprint.

I look forward to the continued support of all parties in making this Blueprint a success and achieving its objectives.
In anticipation of the emerging communications and digital trend, the Ministry of Communications and Multimedia Malaysia needs to be agile in order to respond proactively to the implications of disruptive innovations.

Dato’ Sri Jailani Johari
Connecting people, creating an information society, driving the digital economy and empowering the creative industry are the core missions of the Ministry of Communications and Multimedia Malaysia.

The digital revolution and disruptive change in the jungle of communications and media (C&M) have posed a real challenge in achieving our missions yet at the same time offers us a universe of exciting possibilities. Realising that the digital era is human intensive; an informed and truly digital citizenry can only be accomplished when human is placed at the centre stage of the digital world. This is the core principle and spirit of the Communications & Multimedia Blueprint 2018-2025.

To enhance the capacity of C&M sector to make a difference, the architecture of the Blueprint has been designed in a coherent manner, entrenching in it the two important fundamentals - ‘digitising’ and ‘humanising’. We strongly believe that these two important and mutually reinforcing elements are critical in leap-frogging the C&M sector towards propelling a nation to pursue the impossible.

On behalf of the Steering Committee, I would like to take this opportunity to thank all the stakeholders and the C&M fraternity for your relentless support and cooperation in the formulation of this Blueprint. The journey has just begun. I seek your continued support as we embark on the implementation phase soon.

I am confident that with your whole-hearted commitment and passion, we will be able to overcome the challenges that lie ahead and successfully deliver the desired outcomes.
Realising that the digital era is human intensive; an informed and truly digital citizenry can only be accomplished when human is placed at the centre stage of the digital world.
EXECUTIVE SUMMARY
Malaysia has been making clear strides towards transforming into a high-income nation, with a strong economic growth record amongst Asian countries. As Malaysia approaches this vision, it is critical to position the Communications and Multimedia (C&M) sector as an accelerator to capitalise on new economic opportunities, and to drive Malaysia’s transition towards a fully connected, informed and digital nation.

Public and private stakeholders in the C&M sector have already made significant improvements to the lives of the Rakyat. Beyond its economic contributions, the sector has a prominent role to play in encouraging inclusive development. Empowering all Malaysian citizens ensures that they have equitable access to information, and expands their horizons. Omnichannel communication strengthens the Malaysian social fabric by better connecting individuals and communities, and inspirational local content cultivates a strong national identity.

Given the pervasive nature of communications, multimedia and digital technologies and the potential for broad based impact across industry and society, the Communications & Multimedia Blueprint 2018-2025 (Blueprint) was developed with three objectives in mind:

- To position the C&M sector for sustainable growth amid digital disruption and broader technological advancement.
- To accelerate the growth and transformation of other sectors of the economy.
- To create a connected, informed and empowered society.

In a changing world, the C&M sector presents a landscape of even more rapid change and disruption, driven by four overarching trends. These four trends are driving fundamental shifts in the overall C&M sector and are moving the industry structure towards a stacked architecture.
Figure I  FOUR OVERARCHING TRENDS DRIVING CHANGE IN THE C&M SECTOR

GLOBAL
Increasing regionalisation provides access to a market growing at 9%
Rapid urbanisation will lead to 80% of population living in cities by 2020
Equitable access to the 20% rural population is a priority

TECHNOLOGY
Exponential reductions in the cost of technology drives democratisation of devices
Accelerating increase in technology capabilities gives rise to advanced machine intelligence
Ubiquitous connectivity empowers the proliferation of Internet of Things and pervasive cloud

BUSINESS & GOVERNMENT
Industry 4.0 for production lifts manufacturing productivity by 5-8% on total costs
Cyber threats continue to grow as seen in a 126% increase in incidence of major cyber attacks in 2014
Six percentage points increase in use of Malaysian government services from 2014 to 2016

CONSUMER & SOCIETY
New media consumption growing at 15% per annum becomes preferred channel
Trust deficit has led to trust in Malaysian institutions dropping by 7 percentage points from 2013 to 2016
Figure II  SHIFT IN THE INDUSTRY STRUCTURE TOWARDS A STACKED ARCHITECTURE
Six major stacks operate within the current C&M Sector, and each layer presents a different set of challenges and a call for action.

**NETWORK AND INFRASTRUCTURE**

Given the pervasive nature of digital communications, connectivity infrastructure is a hygiene factor. Network and infrastructure providers are under pressure to invest in capacity to keep pace with growth in data usage. Revenues are under pressure as the market reaches saturation and revenue from traditional voice and SMS services declines, increasingly replaced by services from third-party, over-the-top (OTT) alternatives. This shift in value to OTT pressures organisations’ ability to sustain investment levels, and calls for concerted action to provide high-reach, high-quality, and affordable infrastructure.

**DATA AND ENABLEMENT PLATFORMS**

Rapid reductions in the cost of computing, connectivity, and data storage have led to increasing use of the cloud and the rise of hyperscale data and enablement platforms. Network effects are characteristic of services in this layer, creating large barriers to entry and leading to ‘winner takes all’ dynamics that favour global, hyperscale players. This calls for action from local organisations to build platforms critical to the nation, such as digital identity, to secure Malaysia’s interests in this competitive landscape.

**CREATIVE CONTENT**

Advances in media distribution technologies have made content dissemination easier and created a global playing field. Shifting consumption preferences towards global content and global content platforms are reducing advertising revenues and shrinking broadcast value pools, threatening the long-term sustainability of local content producers and broadcasters, C&M players that are critical to sustaining and cultivating the Malaysian identity.
Executive Summary

DIGITAL ECONOMY

The proliferation of digital technologies across economic activity presents opportunities to transform productivity and increase economic output. Economic agents with limited access to technology resources fall behind in adapting to new technologies, and limit economic development as a consequence. As Malaysia moves to become a developed economy, it needs to position itself not only to adapt, but also to innovate in technology in order to sustain economic growth.

GOVERNMENT ENGAGEMENT

Omnichannel communication permits richness of conversation and two-way engagement on a wide scale. Adopting high-resolution communication by clearly understanding citizens’ expectations and matching communication efforts to citizens’ media consumption preferences will strengthen the Rakyat’s trust in government, and build social cohesion.

Digitisation of government services and communications has proven profitable and useful, offering an opportunity to enhance digital service delivery and move further towards people-centric engagement.

CITIZENS AND COMMUNITIES

Citizens and communities are gaining an increasingly prominent role as producers of online content. Two agendas dominate, driven by the blurring of boundaries between digital activity and the physical world. The first is a need to provide citizens with the tools necessary to protect them from the risks of a digital world that can spill over to the real world with real economic and human consequences. Second, citizens need to be digitally empowered to navigate disruptions given this accelerating change, and to build foundational capabilities that allow Malaysia to create value in the so-called ‘blue ocean’ of uncontested market space.
Continued efforts that focus on the basics of connectivity and managing the industry’s new stacked structure are vital to unlock the full social and economic power of the sector to advance Malaysia’s goal of becoming a high-income, inclusive and sustainable society. The C&M Blueprint defines six strategic imperatives and identifies targeted outcomes, which correspond to the sector challenges and serve the Ministry’s role of humanising digital advancements for the benefit of all. Each imperative has been crafted to reflect Malaysia’s starting point compared to regional and global benchmarks and the most important trends affecting the C&M sector.

Drawing on these six strategic imperatives, 15 policy thrusts have been identified to guide the sector’s development until 2025.
Each policy thrust has been assigned key performance indicators for 2020 and 2025, to quantify both the medium-term and the longer-term aspirations of this Blueprint. The 2020 outcomes reflect the medium-term aspiration to deliver on the C&M promise for all and spur growth in a trusted, open, and robust platform-based society while the 2025 outcomes stretch performance and reflect the aspiration to position the C&M sector to capitalise on new opportunities and benefit from disruption.

Thirty-six programmes have been identified to achieve the policy outcomes. The Blueprint provides a summary description of the objectives, the case for change, recommendations, and the programme owners.
## Figure V: Key Performance Indicators Assigned to Strategic Imperatives and Policy Thrusts

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<th>2020 Outcome</th>
<th>2025 Outcome</th>
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<td><strong>Connecting People</strong></td>
<td>Build future-proof connectivity infrastructure for the nation</td>
<td>95% of populated areas covered with broadband infrastructure</td>
<td>Expand coverage of broadband infrastructure beyond 95% of populated areas</td>
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<td>Enrich digital interactive participation for policy formulation</td>
<td>0.8% citizens engaged in policy ideation with government</td>
<td>1.6% citizens engaged in policy ideation with government</td>
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<td><strong>Strengthening Trust</strong></td>
<td>Secure Malaysian digital space</td>
<td>Top 10 global ranking on the ITU Global Cybersecurity Index</td>
<td>Top 5 global ranking on the ITU Global Cybersecurity Index</td>
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<td>Build a trusted identity for the digital world</td>
<td>30% digital identity penetration</td>
<td>85% digital identity penetration</td>
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<td>Promote open data</td>
<td>Top 20 rank in open data barometer</td>
<td>Top 15 rank in open data barometer</td>
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<td><strong>Intensifying Engagement</strong></td>
<td>Strengthen omnichannel government service delivery</td>
<td>Top 15 rank in UN’s Online Service Index</td>
<td>Top 15 rank in UN’s Online Service Index</td>
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<td>Build targeted and personalised communication</td>
<td>60% faith in Malaysian institutions</td>
<td>63% faith in Malaysian institutions</td>
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<td><strong>Accelerating Innovation</strong></td>
<td>Accelerate adoption of digital enablers</td>
<td>55% SMEs adopt advanced ICT tools and services</td>
<td>75% SMEs adopt advanced ICT tools and services</td>
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<td>Spur innovation ecosystem</td>
<td>18.2% GDP contribution from digital economy</td>
<td>23% GDP contribution from digital economy</td>
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<td>Adopt an agile policymaking approach</td>
<td>Top 30 rank in regulatory quality sub-index of Global Innovation Index</td>
<td>Top 25 rank in regulatory quality sub-index of Global Innovation Index</td>
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<td><strong>Catalysing Creativity</strong></td>
<td>Revitalise local content production and distribution</td>
<td>20% of content consumed locally is Malaysian</td>
<td>30% of content consumed locally is Malaysian</td>
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<td>Enhance Malaysian content beyond borders</td>
<td>Content export revenues of RM1.5 billion</td>
<td>Content export revenues of RM2.0 billion</td>
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<td><strong>Empowering Talent</strong></td>
<td>Embed ‘digital literacy by default’</td>
<td>25% reduction in digital divide</td>
<td>50% reduction in digital divide</td>
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<td>Reskill and upskill talents</td>
<td>ICT skills on par with literacy and numeracy</td>
<td>ICT skills on par with literacy and numeracy</td>
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<td>Develop leading digital expertise</td>
<td>Top 20 rank in ICT-patent production globally</td>
<td>Top 15 rank in ICT-patent production globally</td>
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Executive Summary

Figure VI  THIRTY-SIX BLUEPRINT PROGRAMMES

- Network planning
- Infrastructure rollout facilitation
- Innovative technologies for reach
- Analogue switch-off
- Infrastructure affordability
- Local infrastructure quality
- International connectivity
- Community orchestrators
- Multiple Helix Exchange
- Cyber security standard
- Cyber security capabilities building
- Trusted digital identity
- Digital Trust Index
- Open data
- Personal data protection
- Digital Service Unit
- Smart services working group
- High-resolution communications
- Government communications advisory
- Technology scale-up
- Online presence expansion
- Future Sensing Squad
- Technology experimentation
- Establishment of Digital Hubs
- Policy Advocacy Squad
- Heritage digitisation
- Content Malaysia Umbrella
- Level playing field
- Repositioning national broadcaster
- Strengthening national news
- Malaysia content overseas
- Early digital literacy
- Bridging the Digital Divide
- Continuous learning
- Human capital development fund
- Leading digital expertise

Connecting People  Strengthening Trust  Intensifying Engagement  Accelerating Innovation  Catalysing Creativity  Empowering Talent
The uncertainty inherent in today's globalised, connected world is especially prominent in the C&M sector. In this context, conventional forecasting methods that extrapolate historical trends to the future are no longer considered sufficient. The Blueprint employs scenarios to fortify the recommendations against uncertainty. Multiple trends have the potential to create disruptions and change the shape of the future in a significant way between now and 2025. Two broad dimensions provide a useful framing. The first is social, political and economic dimension; the second is the technology dimension.

Figure VII  FOUR SCENARIOS IN 2025

Two-speed World

Social, economic and digital divide
- Technology advances immensely; 100+ year lifespans common, machines take care of most work, but benefits accrue only to rich
- Rich minority in power, trust deficit leads to regular social disturbances

Peer-to-peer by Default

Decentralised self organising, borderless world
- Decentralised self-organising communities drive politics; government is transparent and fully participative
- General artificial intelligence widely substitutes workers; 25 hour work weeks are the norm

Balkanised Ecosystems

Disintegration as the new normal
- International conflicts common; national security dominates headlines
- Online trust is broken due to incessant cyberthreats; internet switched off by default for most

Eternal Platforms

Socio-economic models centred on hyperscale platforms
- Hyperscale platforms (e.g. for government services, trade, finance), stretch governance, regulation and policy far beyond borders
- Rich, fulfilled lives for all; consumption-driven growth in a developed economy

Source: BCG
Framing the future along the two dimensions offers four divergent scenarios for Malaysia in 2025. Each scenario represents a possible future and a world in which technology and social, political and economic development have evolved in different ways. Across the different futures, different policy responses are needed to ensure that human values continue to remain centre stage. To ensure this, the Blueprint details a set of specific responses to address the various scenarios presented by these potential futures, choosing the areas where Malaysia should shape and accelerate the shift, and those where it is more efficient to adapt.

Finally, the success of the C&M Blueprint depends on a strong and robust governance structure, and involves the participation and mobilisation of major stakeholders. A governance structure is outlined, with clear roles and responsibilities, to coordinate efforts towards successful delivery of the blueprint.

The Blueprint will ensure a deep, vibrant and sustainable C&M sector that acts as a facilitator of broader public and private sector actions to improve everyday life for the Rakyat.
The formulation of the Blueprint benefitted substantially from the extensive deliberations, engagements and dialogues with the Government and industry stakeholders. The Ministry of Communications and Multimedia would like to express its appreciation to the following organisations for their invaluable feedback and insights.

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CHAPTER 1

INTRODUCTION
The Communications and Multimedia (C&M) sector is changing rapidly, both globally and in Southeast Asia. With its contribution to Malaysia’s Gross National Income (GNI) expected to increase from RM22 billion in 2009 to RM58 billion in 2020\(^1\), the Ministry of Communications and Multimedia Malaysia (KKMM) will play a critical role in building the right competitive enablers.

The importance of Communications and Multimedia goes beyond its intrinsic contribution towards creating a vibrant industry. It is also a facilitator of broader public and private sector actions, to improve everyday life for the Rakyat.

Using digital services, for example, may reduce commuting time and create more time for social interactions; accessing open geolocation data may improve the design of evacuation plans for earthquakes and floods; and the implementation of smart and connected city components can improve living standards in small villages in Malaysia and beyond.

Hence, KKMM launched a comprehensive effort to chart the country’s vision for developing the sector through the Malaysia Communications & Multimedia Blueprint 2018–2025.

1.1 Objectives

The Malaysia C&M Blueprint was developed with three objectives in mind:

- To position the C&M sector for sustainable growth amid digital disruption and broader technological advancement.
- To accelerate the growth and transformation of other sectors of the economy.
- To create a connected, informed and empowered society.

Throughout the process, the Ministry collaborated with industry members, industry associations and government agencies. The perspectives shared by and deliberated with the stakeholders shape the Blueprint.
Core challenges affecting the sector were identified through extensive consultations with government agencies, industry participants, international agencies, and local and global experts.

The Blueprint identifies the main trends shaping the C&M sector, priority programmes (along with detailed action plans, timelines and targets), clear responsibilities, and a robust governance model to ensure smooth delivery and optimise performance.

1.2 APPROACH

The Malaysia C&M Blueprint was developed over three phases. The first phase involved an extensive baseline evaluation of Malaysia’s C&M sector. This evaluation reviewed and assessed Malaysia’s performance against other benchmark countries. Core challenges affecting the sector’s performance were identified through extensive consultations with government agencies, industry participants, and local and global experts, who provided a wide range of perspectives. This phase also included the development of a clear vision for the C&M sector and critical considerations for longer-term scenarios.

The second phase involved the development of recommendations to deliver the C&M sector vision. A series of one-on-one engagement sessions, focus group sessions and workshops were organised with the relevant ministries, government agencies, industry participants and industry associations to obtain feedback to design and develop a list of priority programmes. National plans, policy papers, regulations and acts affecting C&M and adjacent areas in Malaysia were referenced in the work. These sessions outlined and validated programme details, including timelines for initiatives, key performance indicators (KPIs) and responsibilities.

The third phase involved finalising the Blueprint. This phase incorporated feedback from a broader set of stakeholders who are removed from but linked to the C&M sector. Acknowledging that successful execution would require strong commitment from multiple ministries and agencies, a robust governance model was designed to guide implementation.
CHAPTER 2

UNDERSTANDING C&M SECTOR
In 2015, Malaysia’s digital economy contributed 17.8 percent to Gross Domestic Product (GDP). The C&M sector is a critical contributor to the country’s overall economic growth, both directly and indirectly. The sector’s direct contribution comes from the value generated by C&M-related businesses. In 2015, the C&M industry generated an estimated RM62 billion in revenue, a growth rate of 4 percent from 2014.\(^2\)

Multiple econometric studies have quantified the indirect contribution of the C&M sector to the overall economy. An increase of 10 percentage points in broadband penetration, for example, leads to an increase of 1.2 to 1.4 percentage points in overall GDP.\(^3\)

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\(^2\) Malaysian Communications and Multimedia Commission, 2015

\(^3\) Qiang et al., World Bank, 2009
2.1 OVERARCHING TRENDS

The C&M sector is changing in fundamental ways. These changes will continue to affect Malaysia and the world. This section explores the different trends shaping the C&M sector in four categories: global trends, technology trends, business and government trends, and citizen and society trends.

2.1.1 Global Trends

Continued regionalisation, including the integration of the Association of Southeast Asian Nations (ASEAN), will present important opportunities for Malaysia as neighbouring countries experience sustained growth in population and GDP. Countries such as Indonesia and the Philippines are expected to generate the vast majority of the region’s MAC population over the next five years, increasing the base of the middle income and
Figure 3  FOUR OVERARCHING TRENDS DRIVING CHANGE IN THE C&M SECTOR

**GLOBAL**

Increasing regionalisation provides access to a market growing at 9%

Rapid urbanisation will lead to 80% of population living in cities by 2020

Equitable access to the 20% rural population is a priority

**TECHNOLOGY**

Exponential reductions in the cost of technology drives democratisation of devices

Accelerating increase in technology capabilities gives rise to advanced machine intelligence

Ubiquitous connectivity empowers the proliferation of Internet of Things and pervasive cloud

**BUSINESS & GOVERNMENT**

Industry 4.0 for production lifts manufacturing productivity by 5-8% on total costs

Cyber threats continue to grow as seen in a 126% increase in incidence of major cyber attacks in 2014

Six percentage points increase in use of Malaysian government services from 2014 to 2016

**CONSUMER & SOCIETY**

New media consumption growing at 15% per annum becomes preferred channel

Trust deficit has led to trust in Malaysian institutions dropping by 7 percentage points from 2013 to 2016
affluent consumers by approximately 120 million from 2013 to 2020. This will lead to an increase in the consumption of information and communication technologies in Southeast Asia from USD505 million in 2016 to USD704 million in 2020, of which 80 percent will be generated by the three fastest-growing countries: the Philippines, Malaysia, and Singapore.

Figure 4  GROWTH OF MIDDLE AFFLUENT CLASS IN MALAYSIA

1. MAC (Middle Income & Affluent Consumers) defined as Emerging + Established + Affluent

Source: BCG, Center for Consumer Insight, 2016
As the region integrates, different countries become increasingly urban, posing the question of equitable access for a rural population that will form a 20 percent minority in Malaysia by 2025. A digital divide in internet use exists among Malaysians today by age, with a gap of 41 percentage points in internet use between citizens aged 18-34 and citizens over 35. Similar gaps in internet use exist by education and income levels as well. Internet use has a clear relationship to income levels, with greater internet use related to higher income levels globally. Providing equitable access will narrow the digital divide and foster inclusive development.

4 & 5: Pew Research Center, 2016
Figure 6  PERCENTAGE OF TOTAL POPULATION IN MALAYSIA BY RURAL VS. URBAN AREA

Source: World Bank, Economist Intelligence Unit, 2016
Figure 7 DIGITAL DIVIDE IN MALAYSIA: GAP IN INTERNET USE BY AGE, EDUCATION, AND INCOME LEVEL

“Adults who use the internet at least occasionally or report owning a smartphone”

Gap in internet use between individuals aged 18–34 and individuals over 35+

- China: 0 percentage points
- Malaysia: 0 percentage points
- Brazil: 0 percentage points
- Philippines: 0 percentage points
- Japan: 0 percentage points
- Germany: 0 percentage points
- U.S.: 0 percentage points
- Canada: 0 percentage points
- UK: 0 percentage points
- South Korea: 0 percentage points

Gap in internet use between individuals with low education vs. high education attainment

- Malaysia: 0 percentage points
- Brazil: 0 percentage points
- China: 0 percentage points
- Philippines: 0 percentage points
- Japan: 0 percentage points
- Germany: 0 percentage points
- U.S.: 0 percentage points
- Canada: 0 percentage points
- UK: 0 percentage points
- South Korea: 0 percentage points

Gap in internet use between lower and higher income individuals

- Japan: 0 percentage points
- Brazil: 0 percentage points
- Malaysia: 0 percentage points
- Philippines: 0 percentage points
- China: 0 percentage points
- Germany: 0 percentage points
- U.S.: 0 percentage points
- Canada: 0 percentage points
- UK: 0 percentage points
- South Korea: 0 percentage points

Note: Lower education category is below secondary education and higher category secondary or above for developing nations. In developed nations lower education is secondary education or below and post-secondary is higher education category. Respondents with a household income below the approximate country median are considered lower income.

Source: Pew Research Center, Spring 2015 Global Attitudes survey
2.1.2 Technology Trends

Processing power, connectivity speeds, and storage capacity continue to grow exponentially, following the three fundamental laws of accelerating returns. An exponential rate of growth implies that future growth is faster than past growth, leading to an accelerating pace of change. This acceleration frequently leads to underestimating the future and introduces significant uncertainty in long-term forecasts. To fortify the Blueprint recommendations against this inherent uncertainty, later chapters include a discussion of potential future scenarios and outline the high-level response options.
Part of the exponential improvement in performance is passed on as cost savings, leading to the democratisation of smart devices such as smartphones, wearables, the Internet of Things (IoT) and Artificial Intelligence (AI), and the proliferation of anywhere, anytime cloud-based digital services.

Wearables, for example, are expected to triple in four years across different sectors and applications, with medical applications forecast to be the largest source of growth.
Figure 10  GROWTH OF WEARABLES ACROSS APPLICATIONS

The IoT presents a vision of connected computational devices everywhere and represents business opportunities of approximately USD300 billion by 2020\(^6\) with applications across industries such as healthcare, utilities, transportation and logistics, manufacturing, and others.

6. International Data Corporation, Gartner 2016
Advances in AI technology continue, transforming the way we interact with machines and how machines assist daily human activities and tasks. The potentially large implications of AI create both opportunities and risks as the boundaries between the digital and the physical world become increasingly blurred. By 2025, the annual disruptive impact from AI could amount from USD14 to USD33 trillion, including a USD9 trillion reduction in employment costs. An outcome of this disruption is the displacement of human jobs by automation. Estimates for jobs at risk of displacement vary by country across the world. In the US, 47 percent of the workforce is estimated to be at risk, 77 percent in China and 69 percent in India.

9. Technology at Work v2.0, Oxford Martin, Citi, 2016
The impact of Artificial Intelligence

Are the machines finally able to beat humans at their own game? Many think that the time is at hand. In 2011, IBM Watson competed on the game show *Jeopardy!* to beat two former winners by best answering questions posed to it in natural language.

So what is AI? While many definitions abound, very simply, AI is technology capable of human-like intelligent behaviour. AI capabilities can be classified as Weak AI or General AI. While General AI, defined as machines with intellectual capability equal to humans, is yet to be fully realised, examples of Weak AI abound in our day-to-day lives today. To name two, social networks recognise that you have logged in from a different location and adjust the feed to your current location, and robots autonomously perform specific tasks assembling mass-produced cars.

After false dawns, facts show that the technologies enabling AI have finally taken off. The enterprise robot market is heating up and will continue to grow steadily: USD390 billion will be spent on hardware, software, and installation costs for enterprise robots over the next six years\(^\text{10}\).

While experts agree that AI will have a number of benefits, such as lower costs and higher productivity, some experts warn AI could get out of control while others worry about widespread unemployment. By 2020, an estimated 5 million net jobs will be lost to increased automation in 15 of the world’s developed economies. New jobs will be concentrated in technology and engineering; automation would help create more jobs in these areas\(^\text{11}\).

---

11. The Future of Employment: How susceptible are jobs to computerization, 2013
With the advancement of cloud computing, large private sector organisations have shifted towards hyperscale computing for server, storage and networking. Hyperscale refers to an architecture’s ability to scale appropriately with increased demand, and is choice for cloud-based businesses such as Facebook, Amazon, and Google. The shift to cloud is empowered by the increased connectivity speed and explosion in storage capacity, and is expected to continue for all types of data from individuals or institutions.
“As the Prime Minister of Malaysia, I want to lay out the foundations needed for our nation to be counted among the very top countries in the world. We want that competitive edge, and to be a knowledge-based society – but we must always work towards those goals in ways that are sustainable, inclusive and equitable. No Malaysian must ever be left behind. All must participate and benefit from this amazing journey that we are on.”

YAB Dato' Sri Mohd Najib Bin Tun Haji Abdul Razak
Invest Malaysia 2017
25 July 2017

2.1.3 Business and Government Trends

Connectivity has become an important tool for businesses and governments around the world to improve services to consumers and citizens. Both have become increasingly reliant on technology to deliver a better quality of services in a more efficient manner.

Every company is becoming a technology company, and information technology investment has risen in a majority of businesses. More spending on information technology has been observed in all major industries, including energy, healthcare, utilities, construction, banking, and financial services. The fourth stage of industrial revolution (Industry 4.0) that is currently upon us emphasises the importance of strengthening the connection between physical and digital systems to boost productivity, especially in the manufacturing industry.
What is Industry 4.0?

Technological advances have driven dramatic increases in industrial productivity since the dawn of the Industrial Revolution. The steam engine-powered factories in the 19th century, and then electrification led to mass production in the early part of the 20th century, and industry became automated in the 1970s.

Industry 4.0 is the fourth stage of the industrial revolution, powered by the rise of new digital industrial technology. With Industry 4.0, sensors, machines, workplaces, and information technology systems will be connected along the value chain beyond a single enterprise. These connected systems (also referred to as cyberphysical systems) can interact with one another using standard internet-based protocols, and analyse data to predict failure, configure themselves, and adapt to changes. Industry 4.0 will make it possible to gather and analyse data across machines, enabling faster, more flexible, and more efficient processes to produce higher-quality goods at reduced costs. This in turn will increase manufacturing productivity, shift economics, foster industrial growth, and modify the profile of the workforce. The race to adopt Industry 4.0 is already underway. In Germany, for example, Industry 4.0 is estimated to boost productivity by €90 to €150 billion over the next five to ten years, drive additional revenue growth of €30 billion a year, and lead to a 6 percent increase in employment over the next 10 years.\(^\text{12}\)

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As digital technologies increase, convenience and easy access have increasingly become users’ top reasons to choose digital services. Citizens increasingly access not only private sector services, but also government services online with 44 percent of Malaysians using online government services at least once a week. The increasing digitalisation of citizen engagement highlights the need for governments to re-orient efforts towards strengthening interaction through online channels. Although 78 percent of Malaysians believe that online government services have improved in the last two years, however online government services are perceived to be indifferent compared to private sector services. Malaysian respondents reported negative perception of the quality of government services; 43 percent perceive government services to be of lower quality, in contrast to 28 percent who reported that government services were better than private services.\(^\text{13}\)

\(^\text{1. Survey question: How often do you access government services online? Response options: More than once a day, Once a day, 2-6 times a week, Once a week, 1-3 times per month, Less than once per month, Once every three months, Once or twice a year, Less than once a year, Not at all. Respondents who selected ‘Once a week’ or more frequent usage have been included.}


Governments are employing digital technologies as cost-effective tools that allow richer two-way engagement with citizens. For instance, South Korea launched the ‘Oasis of 10 million imagination’ programme to seek citizen inputs on policy and encourage interactive conversations on topics of interest.

Despite these opportunities, progressive dependence on digital services and technology raises concerns about vulnerabilities in the cyber world. Approximately 560,000 major cyberattacks were reported in 2015, 209 percent more than in 2013, while investments in upgrading cyber protection rose only marginally by 14 percent. Building a safe and trusted online environment will require attention to the security aspects of this digitised world.
2.1.4 Citizen and Society Trends

Citizens are also using C&M tools in new ways and with changing expectations. For example, Malaysian users are shifting their internet access preferences from desktop to mobile, with mobile internet users projected to overtake desktop internet users by 2020.

Accompanying this shift is a continuing move away from traditional media. Malaysians are shifting to new media as their preferred source of information and will continue to do so; the split of 70:30 for offline to online media consumption in 2011 is projected to invert by 2025\textsuperscript{14} if the same historical trend continues. New media, especially search engines and online-only media, is increasingly becoming a more trusted source of information than traditional media, driving the move to online.

In contrast, overall trust in Malaysian institutions has declined by approximately 11 percentage points since 2013. This trust deficit has real impacts. Without consumer trust, most of the social and economic value from the internet economy will not be realised\(^\text{15}\). For example, the trust deficit is cited as a common barrier holding back e-commerce in Southeast Asia\(^\text{16}\), with e-commerce penetration in Malaysia at approximately 1 percent compared to 11 percent in Asia Pacific\(^\text{17}\).

**Figure 16 TRUST IN DIFFERENT SOURCES OF GENERAL NEWS AND INFORMATION**

![Trust in different sources of general news and information](image)

Question: When looking for general news and information, how much would you trust each type of source for general news and information?

<table>
<thead>
<tr>
<th>Year</th>
<th>Search Engine</th>
<th>Social Media</th>
<th>Traditional Media</th>
<th>Online-only Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>66%</td>
<td>52%</td>
<td>49%</td>
<td>42%</td>
</tr>
<tr>
<td>2013</td>
<td>68%</td>
<td>53%</td>
<td>49%</td>
<td>42%</td>
</tr>
<tr>
<td>2014</td>
<td>66%</td>
<td>52%</td>
<td>49%</td>
<td>42%</td>
</tr>
<tr>
<td>2015</td>
<td>64%</td>
<td>51%</td>
<td>49%</td>
<td>42%</td>
</tr>
<tr>
<td>2016</td>
<td>62%</td>
<td>50%</td>
<td>49%</td>
<td>42%</td>
</tr>
</tbody>
</table>

Source: Edelman Trust Barometer Malaysia Report, 2016, Facebook

\(^{15}\) Unleashing the value of Consumer Data, BCG, 2013  
\(^{16}\) e-conomy SEA, Google, Temasek, 2016  
\(^{17}\) Euromonitor, 2016
Indeed, addressing the institutional trust deficit is crucial to maintain unity and preserve economic momentum in a diverse, multi-racial, multi-lingual society such as Malaysia. Beyond facilitating online identification and ensuring security, addressing the trust deficit requires engaging citizens in two-way dialogue. Face-to-face engagement, one of the most effective ways to build empathy, establish trust, and conduct two-way dialogue, will retain its relevance in a digital world.

Figure 17  ONLINE PURCHASE BEHAVIOR IN MALAYSIA

1. Comparison against emerging Asia Pacific (APAC) countries instead of all of APAC.
2. Social media users as a % of population
3. Share of non-cash payment in all payment¹
4. Internet retail as a % of total retail

Source: Digital, Social and Mobile in APAC 2015; Magna Global, Dec 2015; Worldpay, GPM 2014; Press reports, MC, GSMA
### 2.2 SHIFT IN THE C&M SECTOR

Evolution within the C&M sector is already rapid and will continue to accelerate. These disruptive trends are causing a shift in the overall C&M sector and industry structure. Traditionally, businesses in most industries have a classical oligopolistic structure, with a small number of vertically integrated suppliers competing to serve consumers. In many cases, this structure will evolve into a much more diverse stacked architecture with horizontal layers, as illustrated in Figure 18. In this new structure, platforms of suppliers and customers are interchangeable and interoperable. Players at the bottom provide shared infrastructure, producing and consuming communities are at the top, and traditional oligopolists compete in the middle.

Six major stacks operate within the current C&M sector. From the bottom, the Network and Infrastructure layer builds and manages communications and content distribution infrastructure and delivers fixed, mobile and broadband communications services. The Data and Enablement Platforms reduce transaction costs and provide data to facilitate the flow of information and value within the stack. Here, major activities include facilitating trust and security, the flow of data and analytics, and together with billing and payments. Security is an encompassing feature that is relevant across all layers of the stack.
As for the Government engagement layer, it focuses on government service delivery and government communication. Whilst, the Digital economy layer creates a whole new types of retail channels and manufacturing that impacted current and future economy. The Creative content layer creates and curates content, goods, and services, while also providing channels for consumer access and purchase. The Digital economy layer provides retail channels and manufacturing. Finally, the Citizens and communities layer uses communications services, and can both produce and consume different types of digital content.

Figure 19  THE LAYERS ACROSS THE STACK
### Discussion Box

#### The C&M structure

<table>
<thead>
<tr>
<th>Citizens and communities</th>
<th>Content and services</th>
<th>Data and enablement platforms</th>
<th>Network and infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DESCRIPTION</strong></td>
<td>Creative content: curate content, goods, and services and provides channels for consumer access and purchase.</td>
<td>Facilitate the flow of information and value higher in the stack by reducing transaction costs and providing data/analytics.</td>
<td>Build and manage communications and content distribution infrastructure.</td>
</tr>
<tr>
<td><strong>TYPES OF PARTICIPANTS</strong></td>
<td>Types of participants: Consumers, Citizen journalists, bloggers, participants on social media.</td>
<td></td>
<td>Types of participants: Fixed, mobile, and broadband service providers, Infrastructure owners, Data center providers, Broadcast providers, Consumer device manufacturers/retailers.</td>
</tr>
<tr>
<td></td>
<td>Services: design and create content or goods and services for consumption.</td>
<td>Facilitating payments: Billing and payments, ad enablement services.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Services: Retailers (online/physical), Government digital services, Government.</td>
<td>Facilitating flow of data/analytics: Metrics/analytics and ratings services, government data providers, big data analytics.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.3 IMPACT AND CALL FOR ACTION

Given this shift towards horizontal stacking in the industry, visible disruptions are already occurring across all layers of the stack.

2.3.1 Network and Infrastructure

Markets within the network infrastructure layer are scale-intensive. For example, with fixed broadband infrastructure, rollout is faster and more efficient when done at scale given the sector’s capital-intensive nature. Broadcast towers and relay towers are similar to a certain extent.

Telekom Malaysia is the largest player, providing fixed-line services in the retail and wholesale telecommunications sector in Malaysia, while Celcom, Digi, Maxis and U Mobile are the larger players in the mobile sector. For most industry players, the average revenue per user has declined as the market reaches saturation. Reason being the revenue generated from traditional voice and SMS services declines as it is substituted by Over-the-Top (OTT) alternatives. In a world of pervasive digital connectivity, infrastructure is a hygiene factor and will continue to be under pressure with growth in data usage. Players in this layer are under pressure to sustain the investment levels required for a high-reach, high-quality and affordable infrastructure in the long run.
Postal services are still vital component of the communications infrastructure, even though traditional letter volumes has declined due to digital substitution. While the shift towards e-commerce delivery services and digital data-based services offers a path to commercial viability, the local presence of the postal network can be used for social and community support purposes.

### 2.3.2 Data and Enablement Platforms

Increasing use of the cloud and the rise of hyperscale platforms are outcomes of rapid reductions to the cost of computing, connectivity and data storage. An evolving dynamic in this layer is the change in the flow of information and shifting focus to unlocking value embedded within data flows. Increasingly, ‘digital identities’, the sum of all digitally available information about an individual, are becoming complete and traceable, and present significant potential. The value created by a digital identity can be massive. In Europe, leveraging digital identity can deliver a €330 billion annual economic benefit for organisations and €330 billion annual economic benefit to consumers by 2020\(^\text{18}\).

The number of cloud platform providers has also mushroomed, increasing the availability of information and communication technology (ICT) platforms and Software as a Service (SaaS). Billing and payment channels have gradually changed due to the increase in e-commerce services offered by a range of private companies such as PayPal, with security protocols being a critical feature. Security and encryption have become essential for the protection of electronic transfers of data using various methods offered by global large scale providers.

Network effects are characteristic of services in this layer, creating large barriers to entry and leading to a ‘winner takes all’ dynamic that favours global, hyperscale players. This calls for action from local organisations to build platforms, such as digital identity, that are critical to the nation to secure Malaysia’s interests in this competitive landscape.

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Figure 21  THE VALUE OF DIGITAL IDENTITY IN EUROPE

Economic value of digital identity in EU-27 2020 (€B)

2.3.3 Creative Content

The proliferation of innovative content and digital services has greatly improved user experiences. New content distribution channels offer a wide variety of discovery options enabled by different business models, such as ad-funded, user-funded, and ‘freemium’ content.

On the content production end, user-generated content has grown rapidly in both entertainment and news. Technology advances have put increasingly sophisticated production tools in the hands of everyone, enabling the growth of small content creators, amongst several big budget studios for films, animations, games, and other creative content.

In this environment, Malaysian content, application creation, and value capture face longer-term disruptions from regional and international participants because of the increased ease of distribution access. Revitalising the local creative content sector to face these disruptions will serve dual objectives: the economic objective of capturing value from the creative content industry; and the social objective of providing inspirational local content that strengthens the Malaysian identity and culture.

On the user access end, content aggregation services and platforms have encouraged a shift in user preferences to OTT providers. Subscription TV is trying to adapt to consumer preference shifts by offering more Internet Protocol Television (IPTV) services. While free-to-air (FTA) TV and print media still remain important sources for news and entertainment, decreasing advertising revenues will shrink broadcast value pools and place pressure on the long-term sustainability of some players.
Figure 21  MEDIA CONSUMPTION TRENDS

Note: Asia Pacific excluding Japan, China, India, South Korea and Australia. Traditional media includes linear television programming, terrestrial radio, physical film, home video, print, and news. New media includes internet media, mobile media, and other digital media such as over-the-top video.

Source: PQ Media
2.3.4 Digital Economy

The Digital Economy is a fast-growing growth area with opportunity to impact the entire economy through application of digital technologies. The global digital economy is growing at more than 10% CAGR per year compared to overall global growth forecasts of 2-3%\(^\text{19}\). Digital trends are reshaping firms and sectors throughout the broader economy, affecting both public and private sectors. The pervasive impact of digital disruption can be observed, for example, in the banking and insurance sector, where consumption preference has shifted from in-person transactions and advice to online interaction. The industrial goods sector is another area that has transitioned from local, dispersed operations to remote autonomous operations empowered by sensing and analytics technologies. Similarly, the retail sector has shifted from retail stores to virtual stores and from in-shop consulting to customer reviews.

The digital economy in Malaysia is being spurred by the information and communications technology (ICT) industry and the pervasive use of ICT by the vertical sectors in Malaysia. Adapting and maximising value from current and future waves of innovations will position Malaysia to capture the optimal benefit from communications and multimedia technologies.

### 2.3.5 Government Engagement

Digitisation of government services and communications has proven profitable and useful. A study estimates that citizens will engage with governments for one in three transactions digitally by 2020, up from
Figure 25  GROWTH OF E-COMMERCE IN SOUTHEAST ASIA

Source: Euromonitor, 2016
one in ten in 2014\textsuperscript{20}, driving savings of USD50 billion globally. With increasing use of digital services, clear preferences have emerged with the most demand for digital services in five areas – education, welfare, immigration, employment and healthcare\textsuperscript{21}. The education sector has shifted from traditional classrooms to digitally equipped and enabled learning centres. Distance learning programmes offered by Massive Open Online Courses (MOOC) providers such as Coursera, Udacity and edX have become standard and permanently changed the education landscape. Another major sector that has adapted to the digitalisation movement is healthcare, where paper records are progressively moving to electronic medical records, and telehealth is replacing physical consultation. Given these trends, governments around the world are shifting from physical services to online service delivery, and moving from physical infrastructure to cloud, shared services.

Models such as wikis and social media capture two-way feedback, facilitate the exchange of ideas, and are increasingly employed in government communications worldwide. Enabled by big data analytics (BDA), online communications technologies allow personalised two-way interactions. Malaysia has an opportunity to draw on these technologies to enhance digital service delivery and move towards people-centric engagement.

\textsuperscript{20 & 21. Governments are Going Digital, BCG, 2014}
Citizens and communities are playing an increasingly prominent role as producers of content. The integration of social media into the daily lives of citizens has encouraged the participation of virtual communities and networks to view, create and share information and ideas.

2.3.6 Citizens and Communities

Citizens and communities are playing an increasingly prominent role as producers of content. The integration of social media into the daily lives of citizens has encouraged the participation of virtual communities and networks to view, create and share information and ideas. Social media platforms allow users to both consume content and distribute user created content.

The creation of online content has become democratised as users have developed various types of online content and found ways to monetise it, through YouTube and other platforms.

Other online content, such as digitisable physical objects (designs for physical goods such as home improvement items, furniture), has also become more popular among online users. Users are sharing downloadable designs online, and can manufacture them independently through 3D printing facilities. Digitalisation has also stimulated massive online collaborative production, such as widely used open source and free-to-use software Linux and the Apache web server. Information content is another category of products created by massive crowd sourcing, such as online encyclopaedias, dictionaries, travel guides, and learning materials (Wikipedia, encyclopedias).

Two objectives dominate, driven by boundaries blurring between the digital and physical worlds. The first is a need to empower citizens to ensure protection from the risks of a digital world that can spill over to the real world with real economic and human consequences. The second is to digitally empower citizens to navigate disruptions given this accelerating change, and build foundational capabilities to enable Malaysia to lead value creation in select areas.

In summary, these six shifts create an urgent need for the C&M sector to review its focus and set clear strategic imperatives to capture the full social and economic value for the country during its transition to a digital economy.

The following chapters introduce these strategic imperatives, after a comprehensive review of Malaysia’s starting position.

Subsequent chapters explain each imperative in detail, along with their corresponding policy thrusts and specific programmes to develop the sector to its full potential and drive positive social and economic change in Malaysia.

Beyond this, the Blueprint discusses scenarios to guide decisions that will ensure Malaysia is ready to shape and extract value from longer-term disruptions.

22. Malaysia has existing mechanisms on content, for example the Content Forum
Digitise and Humanise

In an increasingly digital world, the boundaries between digital and the physical worlds are blurred. The rapid spread of communication technologies, especially social media, provides attackers with sophisticated tools to perpetuate crime online. The story of CYNK illustrates how actions in the digital world translate into large-scale, real-world consequences.

CYNK started trading in 2013 for a few cents a share. Prices stayed low until 17 June, 2014 when the stock started to surge, following rumours on social media about its plans to create a new social network. CYNK shares rose over 36,000 percent, to hit $21.95 before trading was halted. An unknown company with one employee, no assets, and no revenues achieved a market valuation of $6 billion, almost overnight, and then collapsed quickly, generating enormous losses for late investors, after the Securities and Exchange Commission stepped in.


Source: Google finance, Bloomberg
CHAPTER 3

MALAYSIA’S C&M SECTOR TODAY
To set a starting point for the Blueprint, Malaysia’s current performance in the C&M sector was assessed against the six stack elements: Network and Infrastructure; Data and Enablement Platforms; Creative Content; Digital Economy; Government Engagement; and Citizens and Communities.
For each sub-component of the stack, Malaysia was assessed against global benchmarks using available reports and studies. The findings are described in the following sections.
3.1 NETWORK AND INFRASTRUCTURE

The assessment of the infrastructure layer covered three topics critical to be balanced: reach, quality, and affordability.

Malaysia has invested in national public-private partnership programmes such as High Speed Broadband and Broadband for General Population, prioritising the growth of internet coverage over other parameters. As a result, the number of households with internet access grew from 55.6 to 71.1 percent of the population between 2010 and 2016\textsuperscript{24}, fostering an increase in the number of internet users. Malaysia still has room to grow to reach the levels of coverage in the United States or Japan.

\textsuperscript{24} International Telecommunications Union, 2016
Recent national private-public programmes such as the High Speed Broadband Project Phase 2 and Sub-Urban Broadband look to deploy additional access and core capacity to increase the quality of connectivity nationwide. In 2016, Malaysia ranked 68 out of 142 countries on infrastructure quality, ahead of developing countries such as India, Brazil and China\textsuperscript{25}, but behind developed countries such as Singapore, the United States and Japan. However, it should be noted that Akamai’s results may not fully reflect the overall quality of the infrastructure, because average speeds calculated are based on users’ subscribed packages and only traffic that reaches Akamai servers.

In 2016, Malaysia ranked 42 out of 182 countries for the affordability of its fixed broadband price as a percentage of GNI, ahead of developing countries such as Thailand, Philippines and Indonesia, but lagging behind developed countries such as Japan, the United Kingdom and Singapore\textsuperscript{26}. This international benchmark is based on the pricing of an entry-level broadband package, which was 1Mbps in Malaysia, raising earlier questions of infrastructure quality. Acknowledging the continued importance of high-speed and high-quality connectivity infrastructure, the 2017 budget announced plans to double internet connection speed, with a reduction in prices by 50 percent\textsuperscript{27}.

\textsuperscript{25} Akamai, 2016
\textsuperscript{26} International Telecommunications Union, 2016
\textsuperscript{27} Malaysia Annual Budget 2017
Figure 30 RANKING OF COUNTRIES BASED ON FIXED BROADBAND AFFORDABILITY

3.2 DATA AND ENABLEMENT PLATFORMS

The central role played by the Data and Enablement Platform layer is to instil convenience and trust in the stack interaction. Three aspects were assessed: cyber security, digital identification systems, and open data. Malaysia recognised cybersecurity as a national priority early. Its efforts to secure cyberspace have included the creation of CyberSecurity Malaysia and the National Cyber Security Policy, leading to a global ranking of 3 of 29 in ITU's Global Cybersecurity Index. A 2016 National Exposure Index issued by Rapid7 shows that Malaysia is ranked 31, which calls for continued efforts to strengthen cyber security.

28. Global Cybersecurity Index, International Telecommunications Union 2014
29. Rapid7, National Exposure Index 2016
Figure 32  MALWARE THREATS RAPID7

Top 50 countries, National Exposure Index

<table>
<thead>
<tr>
<th>Country</th>
<th>Exposure Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>4</td>
</tr>
<tr>
<td>China</td>
<td>5</td>
</tr>
<tr>
<td>United States</td>
<td>14</td>
</tr>
<tr>
<td>Japan</td>
<td>16</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>23</td>
</tr>
<tr>
<td>South Korea</td>
<td>26</td>
</tr>
<tr>
<td>Malaysia</td>
<td>31</td>
</tr>
<tr>
<td>Taiwan</td>
<td>33</td>
</tr>
<tr>
<td>Singapore</td>
<td>49</td>
</tr>
</tbody>
</table>

Note: Lower ranks (i.e. larger numerical ranks) are better and denotes lower exposure to cyber threat

Source: Rapid7, National Exposure Index 2016
Other early efforts, such as the MyKad, MyIdentity, and the Digital Signature Act, have contributed to secure and trusted digital proof of identity in Malaysia. A number of governments around the world have moved to establish fully digital identities for citizens and even companies. NEM ID in Denmark, for example, provides a trusted digital identity blueprint for access to all public and private sector digital services. Malaysia ranked 40 out of 193 countries on the online services index, ahead of countries such as the Philippines, Thailand and Indonesia, but behind developed countries that use digital identities to massively increase the security and convenience of using online services, such as the United Kingdom, Canada and Singapore.

Malaysia embarked on Open Government data in 2014, with data.gov.my featuring more than 1,400 datasets. Malaysia ranks 51 out of 92 countries for open government data, behind developing countries and regional peers such as Brazil, the Philippines, and Indonesia. Expanding the open data effort to industry has the potential to increase private sector innovation and productivity. Research shows that companies which leverage data effectively generate 12 percent higher revenues than companies that do not use big data effectively.

Note: Compared to 2014, Malaysia has dropped 10 places, Indonesia has dropped 4 ranks and Philippines has advanced 17 ranks. Indonesia is ahead on implementation (i.e. dataset coverage and quality). Philippines is behind on readiness, but has a significant lead in implementation and impact (impact of Open Data) over Malaysia.


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31. Sourced from data.gov.my in November 2016
32. World Wide Web Foundation Open Data Barometer 2015
33. BCG, 2014
3.3 CREATIVE CONTENT

In addition to economic contributions, a vibrant creative content sector has the potential to strengthen the national identity by valuing heritage, making it relevant in the digital world, and inspiring Malaysians through authentic local content. In Malaysia, the entertainment and media sector is forecast to grow at 6.1% in 2019, demonstrating robust demand for creative content.\(^{34}\)

The creative content sector (animation content, applications, and games) has performed well, recording 2% growth from 2014 and reaching revenues of RM7.24 billion in 2015.\(^{35}\) In contrast, Malaysia’s revenue from locally produced films is at 6%, a fall from 21% in 2011, ranking lower than both developed and developing countries such as South Korea (59%), France (30%), Brazil (17%), and the Philippines (32%).\(^{36}\)

There is a need to shift policy focus from subsidies to infrastructure and talent support for sustainable development of the sector.

Exports of creative services, at USD$175 million, have room to grow when compared to developed countries such as Singapore (USD$507 million) and the United Kingdom (USD$3.9 billion), and developing countries such as India (USD$770 million) and Indonesia (USD$220 million).\(^{37}\)

---

34. Malaysia entertainment and media outlook, PWC, 2015
36. National Film Development Corporation Malaysia (FINAS), United Nations Educational, Scientific and Cultural Organization (UNESCO)
Figure 34  REVENUE FROM LOCALLY PRODUCED FILMS BY COUNTRY

Revenue from locally produced films (%)

South Korea 59
Philippines 32
France 30
United Kingdom 22
Brazil 17
Argentina 15
Spain 14
Malaysia 6

Note: Malaysia statistics for 2015 and benchmark country statistics for 2013
Source: FINAS, UNESCO cinema statistics database
3.4 DIGITAL ECONOMY

The digital economy, comprising 17.8% of Malaysia’s GDP in 2015, recorded a 9.4% increase over 2014. The continued growth of the digital economy will depend on the management of two complementary technology usage cycles: first, adoption of proven mature technologies to drive productivity; and second, experimentation with emerging technologies to anticipate future disruptions.

Looking at technology adoption, Malaysia has a low percentage of ICT expenditure over added value compared to benchmark countries in eight main economic sectors: Retail and Wholesale; Government; Finance and Insurance; Transportation; Utilities; Education; Healthcare Providers; and Manufacturing. ICT expenditures in Manufacturing, Utilities, and Transportation register the widest gaps compared to benchmarks, and offer opportunities for growth.

Note: UNCTAD’s definition of Creative industries includes traditional media (film, TV and print), new media (digitised content), visual arts, performing arts, cultural sites, design and other creative services (such as festivals, celebrations, creative R&D, etc).

Source: UNCTAD Creative Economies report, 2016
Figure 36  MALAYSIA’S PERCENTAGE OF ICT EXPENDITURES OVER ADDED VALUE 2014

Note: Developed country benchmarks include USA, Australia and Singapore. Developing country benchmarks include Indonesia, Thailand, India and China.

Source: Department of Statistics, Malaysia, Gartner, BCG
Beyond encouraging the adoption of mature technologies, Malaysia can stay ahead of the curve by encouraging an equal level of innovative experimentation on new disruptive technologies. In 2016, Malaysia ranked 35 out of 128 countries for Knowledge and Technology Innovation Output\(^39\). While ahead of developing countries such as Vietnam, the Philippines, and Thailand, Malaysia is outpaced by developed countries such as Finland, Germany, and Ireland. Malaysia ranked 78 out of 128 countries for quality of regulation indicating the need for regulation, that facilitates more innovation\(^40\). Leadership in innovation will demand refocused efforts to identify new trends as they emerge and targeted investments towards achieving leadership positions in selected areas.

\(^{39 \& 40.} \) Global Innovation Index, World Intellectual Property Organization, INSEAD, Cornell University, 2016
Despite wide availability of services, a majority of Malaysians perceive that the government’s online services can still improve when compared to private sector digital services.

3.5 GOVERNMENT ENGAGEMENT

Government engagement has two complementary aspects: service delivery and communications.

Recognising the high demand for online government services, the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) has launched initiatives that have boosted digital delivery and operations of basic services, with 87% of government services available online. Despite wide availability of services, a majority of Malaysians perceive government’s online services can still improve compared to private sector digital services. Malaysia lags in this area behind developed countries such as Singapore and France, and developing countries such as India and China.

To further improve public service delivery, MAMPU has developed an ICT Strategic Plan (ISP) 2016-2020 that outlines the strategic direction of ICT Implementation in the Malaysian Public Sector.

Government communications have a prominent role in shaping public debate and building trust. Malaysia’s Rukun Negara communicated effectively as a platform after racial riots in the 1960s, strengthening social cohesion and national unity. In recent years, Malaysian’s trust towards institutions has declined from a peak of 62% of the general population in 2013, to 51% in 2016. This stands close to the global average of 50% in 2016, and reflects the need for action to recapture a position of strength.

41. MAMPU, 2016
42. BCG Digital Government Satisfaction Survey, 2014 and 2016
43. Edelman, 2016
Figure 38  GOVERNMENT ONLINE SERVICES COMPARED TO PRIVATE SERVICES

“Compared to the private sector, Government online services are generally ...”

<table>
<thead>
<tr>
<th>Country</th>
<th>Much worse</th>
<th>Somewhat worse</th>
<th>Somewhat better</th>
<th>Much better</th>
</tr>
</thead>
<tbody>
<tr>
<td>UAE</td>
<td>7</td>
<td>35</td>
<td>29</td>
<td>63</td>
</tr>
<tr>
<td>KSA</td>
<td>9</td>
<td>35</td>
<td>29</td>
<td>53</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>2</td>
<td>17</td>
<td>9</td>
<td>29</td>
</tr>
<tr>
<td>Singapore</td>
<td>1</td>
<td>14</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>India</td>
<td>4</td>
<td>25</td>
<td>27</td>
<td>24</td>
</tr>
<tr>
<td>China</td>
<td>11</td>
<td>14</td>
<td>15</td>
<td>24</td>
</tr>
<tr>
<td>France</td>
<td>1</td>
<td>11</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Estonia</td>
<td>1</td>
<td>14</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Russia</td>
<td>3</td>
<td>21</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>South Korea</td>
<td>5</td>
<td>18</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>United States</td>
<td>4</td>
<td>23</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>Indonesia</td>
<td>5</td>
<td>30</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>5</td>
<td>19</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Sweden</td>
<td>2</td>
<td>16</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Australia</td>
<td>22</td>
<td>11</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>New Zealand</td>
<td>3</td>
<td>19</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Netherlands</td>
<td>4</td>
<td>20</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Norway</td>
<td>8</td>
<td>27</td>
<td>6</td>
<td>-11</td>
</tr>
<tr>
<td>Denmark</td>
<td>4</td>
<td>26</td>
<td>2</td>
<td>-14</td>
</tr>
<tr>
<td>Malaysia</td>
<td>6</td>
<td>37</td>
<td>6</td>
<td>-15</td>
</tr>
</tbody>
</table>

1. Survey question: Thinking about how government online services compare to private sector online services from banks, telecoms, insurance, retail, hotels and airlines, which of the following statements most reflects your view? Compared to the private sector, Government online services are generally .... Response options range from 1–5, where 1 = Much better, and 5 = Much worse. Net perception measures the difference in percentage points between respondents that reported Somewhat better or Much better and respondents that reported Much worse or Somewhat worse.

Source: BCG 2016 Digital Government Satisfaction Survey
3.6 CITIZENS AND COMMUNITIES

Malaysia's performance on this layer was assessed through complementary stages: technology literacy, digital proficiency, and thought leadership.

Despite mobile broadband being relatively more affordable in Malaysia than in some developed countries, and broad nationwide coverage, internet use lags developed countries, with only 71.1% of Malaysians using the internet in 2015. Research on consumer barriers to internet adoption identifies the lack of awareness, a shortage of locally relevant digital content, and a lack of digital literacy skills as the top three barriers to internet use in Asia Pacific. This suggests a need to look beyond infrastructure coverage and affordability, and broaden efforts to address barriers to internet use, such as technology literacy and low awareness of value in internet use.

Figure 39  INTERNET USE VS BROADBAND AFFORDABILITY

Source: International Telecommunications Union

44. International Telecommunications Union, 2016
45. Consumer barriers to mobile internet adoption in Asia, GSMA, 2016
Driven by disruptive digital technologies, changes to business models will have a transformative impact on the employment landscape. The major drivers of transformation currently affecting the global landscape are expected to have a significant impact on jobs, ranging from job creation, job displacement, to heightened labour productivity and widening skills gaps. In this context, computational thinking and ICT skills have become essential to all occupations. Malaysia’s employers rate ICT skills as the second most deficient after the English language, highlighting the need to strengthen these skills for success.

Leading digital talent and thought leadership is essential to develop the digital economy and produce growth from innovation. Malaysia ranks 31 out of 137 countries in ICT Patent Cooperation Treaty (PCT) patents and applications per million of population, ahead of developing countries such as India, Thailand, and the Philippines, but behind developed countries such as Sweden, Japan, and South Korea.

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47. Network Readiness Index, World Economic Forum, 2016
Figure 41 IMPACT OF TECHNOLOGY ON EMPLOYEE SKILLS

Drivers of change, time to impact on employee skills

- Mobile internet, cloud technology
- Processing power, Big Data
- New energy supplies and technologies
- Internet of Things
- Sharing economy, crowdsourcing
- Robotics, autonomous transport
- Artificial intelligence
- Adv. manufacturing, 3D printing
- Adv. materials, biotechnology

Source: Future of Jobs survey, World Economic Forum
Note: Names of drivers have been abbreviated to ensure legibility
Figure 42  RANKING OF COUNTRIES BY ICT PATENTS AND APPLICATIONS

<table>
<thead>
<tr>
<th>Country</th>
<th>ICT PCT1 patents and applications (2016)</th>
<th>Global Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>153.1</td>
<td>1</td>
</tr>
<tr>
<td>Japan</td>
<td>137.5</td>
<td>3</td>
</tr>
<tr>
<td>South Korea</td>
<td>107.8</td>
<td>5</td>
</tr>
<tr>
<td>Switzerland</td>
<td>74.6</td>
<td>6</td>
</tr>
<tr>
<td>United States</td>
<td>69.8</td>
<td>7</td>
</tr>
<tr>
<td>Singapore</td>
<td>55.8</td>
<td>9</td>
</tr>
<tr>
<td>Germany</td>
<td>52.3</td>
<td>10</td>
</tr>
<tr>
<td>France</td>
<td>33.5</td>
<td>16</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>31.1</td>
<td>17</td>
</tr>
<tr>
<td>China</td>
<td>9.5</td>
<td>26</td>
</tr>
<tr>
<td>Malaysia</td>
<td>6.0</td>
<td>31</td>
</tr>
<tr>
<td>India</td>
<td>0.5</td>
<td>39</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.2</td>
<td>75</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.1</td>
<td>81</td>
</tr>
</tbody>
</table>

# per million population
“Breaking through to high income status is only one of the aims of the National Transformation Programme. The NTP also aims to generate benefits for all Malaysians. It is key that no Malaysian gets left behind; that the needs of all our people are met; and that all communities, whether large or small, are able to contribute to and share in the wealth of the country.”

YAB Dato’ Sri Mohd Najib Bin Tun Haji Abdul Razak
Global Transformation Forum 2017
22 March 2017
CHAPTER 4

STRATEGIC IMPERATIVES
The C&M sector will strive to adapt to continuous disruptions, harness opportunities offered by advances in digital technology, and lead in the use of C&M innovations towards improving everyday life for *Rakyat*.

A deep, vibrant and sustainable C&M sector is an essential component of Malaysia’s aspiration to become a high-income, inclusive, and sustainable nation. To that end, the sector will strive to adapt to continuous disruptions, harness opportunities offered by advances in digital technology, and lead in the use of C&M innovations towards improving everyday life for *Rakyat*. To best deliver this vision, the Blueprint has been carefully developed so that ‘Digitise’ and ‘Humanise’ work hand-in-hand. ‘Digitise’ maximises economic value captured from the sector, while ‘Humanise’ strengthens the social fabric and cultivates a stronger national identity. Together, ‘Digitise’ and ‘Humanise’ ensure balanced development of the C&M sector and energise economic and social development of the nation.

To unlock the full economic and social value of C&M for Malaysia, the sector must focus on clear priorities. This Blueprint identifies six strategic imperatives:
Figure 43  SIX STRATEGIC IMPERATIVES TO DELIVER THE C&M VISION

1. Connecting People
   Build pervasive and accessible connectivity for the nation

2. Strengthening Trust
   Strengthen trust advantage in a convenient, data-enriched and secured cyberspace

3. Intensifying Engagement
   Intensify government engagement through digital inclusion

4. Accelerating Innovation
   Harness value extraction from current and future waves of technology and innovation

5. Catalysing Creativity
   Cultivate creativity to share authentic and inspirational local content with Malaysians and beyond

6. Empowering Talent
   Revitalise digital talent empowered with knowledge, mindset and future skills
Fifteen corresponding policy thrusts and 36 programmes fall under the strategic imperatives to guide the sector’s development until 2025. The six strategic imperatives to deliver on the sector’s vision were developed after reviewing trends that affect the sector and after assessing Malaysia’s starting point compared to regional and global benchmarks. The six strategic imperatives comprehensively address each of the C&M stack layers.

The following sections describe the six strategic imperatives and 15 related policy thrusts in greater detail.
4.1 CONNECTING PEOPLE

Build pervasive and accessible connectivity for the nation

The C&M sector has a primary role as the provider of connectivity infrastructure to all. In today's world, connectivity infrastructure is basic to most social, economic and government activities and therefore needs to be considered a utility. The first strategic imperative responds to this need.

Policy Thrust 1(a)
Build future-proof connectivity infrastructure for the nation

- Build ubiquitous technology-neutral infrastructure
  - Expand infrastructure coverage nationwide through the optimal mix of fixed and mobile technologies
  - Encourage technology neutrality to increase efficiency in the use of scarce resources
  - Explore innovative approaches to meet the needs of difficult-to-connect communities in a human-centric manner
- Ensure quality and security of infrastructure for future use

Policy Thrust 1(b)
Enrich digital interactive participation for policy formulation

- Adapt quality monitoring and measurement to meet increasing demand on the amount, speed and integrity of data traveling through the system (throughput, latency and packet loss)
- Ensure transparency in service providers’ performance for end consumers, to encourage healthy competition
- Increase infrastructure affordability through market transparency
  - Increase market transparency to encourage sustainable competitive prices at the edge of the infrastructure stack
  - Encourage infrastructure sharing to take advantage of economies of scale in rollout

In addition to the policy thrusts outlined, Malaysia needs to plan for top-down interventions in cases of proven market failure. Beyond network infrastructure, Malaysia needs to enrich connected communities through ground-level community presence, which leads to the second policy thrust.
4.2 STRENGTHENING TRUST

Strengthen trust advantage in a convenient, data-enriched and secured cyberspace

Trust in online services is a pre-requisite for widespread use. Strengthening trust advances Malaysia towards the promise of an information society open for all. Three policy thrusts will help Malaysia strengthen its trust advantage:

Policy Thrust 2(a): Secure Malaysian digital space
- Secure C&M sector with vertical-specific cyber-security standards
- Expand coverage to ‘weakest link’ individuals and institutions in an increasingly connected ecosystem

Policy Thrust 2(b): Build a trusted and inter-operable identity for the digital world
- Support an inclusive trust blueprint that guarantees adaptability to public and private uses
- Encourage increased usage of national digital identity among citizens and institutions
- Prepare for cross-border usage through built-in interoperability criteria

Policy Thrust 2(c): Promote open data
- Promote data as infrastructure equally to both for public and private sector equally
- Guarantee privacy of personal data irrespective of usage or owner
4.3 INTENSIFYING ENGAGEMENT

Intensify government engagement through digital inclusion

Advances in communications and multimedia make it possible for governments to engage citizens through rich, personalised, contextual two-way conversations. Governments engage citizens online in two primary contexts: government service delivery; and government information dissemination.

Two policy thrusts draw on communications and multimedia advances to renew government engagement through people-centric communication:

**Policy Thrust 3(a): Strengthen omnichannel government service delivery**

- Broaden the scale up of government digital services across all priority citizen needs

**Policy Thrust 3(b): Build targeted and personalised communications**

- Allow equal access to services irrespective of channels (digital or physical)
- Ensure seamless transition between channels by secured sharing of information

Moving towards a people-centric culture in government communications, using the right tools and know-how to build a trusted two-way platform for citizens, will allow Malaysia to increase government engagement with its citizens, and ultimately strengthen trust and collaboration.
4.4 ACCELERATING INNOVATION

Harness value extraction from current and future waves of technology and innovation

The C&M sector is characterised by continuous innovation, the impact of which extends beyond the sector to the broader economy and society.

Three policy thrusts have been identified to maximise Malaysia’s capacity to capture value from the digital economy:

**Policy Thrust 4(a):** Accelerate adoption of digital enablers
- Eliminate sector-specific adoption barriers
- Promote benefits to uninformed economic agents
- Set-up targeted support to increase adoption of proven digital enablers among under-penetrated segments

**Policy Thrust 4(b):** Spur innovation ecosystem
- Develop Malaysia’s technology sensing capabilities
- Encourage a culture of experimentation among Malaysian businesses and citizens
- Focus support efforts on opportunities with higher ‘ability to win’

**Policy Thrust 4(c):** Adopt an agile policymaking approach
- Promote emerging technology dissemination through innovation-friendly regulation and inception support
- Encourage collaborative policymaking and regulation across sectors

Extracting the greatest possible value from the current wave of innovations and capturing value from future waves of innovation in the digital economy will enable Malaysia to realise its aspirations to become a high-income nation.
4.5 CATALYSING CREATIVITY

Cultivate creativity to share authentic and inspirational local content with Malaysia and beyond

The Malaysian identity is best expressed through and shaped by authentic local creative content that can be self-sustaining overtime. Two policy thrusts have been identified with this objective in mind:

Policy Thrust 5(a): Revitalise local content production and distribution

- Balance support actions between funding and non-funding to promote efficient use of resources
- Direct industry financial support towards critical steps of the value chain, emphasising outcomes
- Coordinate interventions from different public bodies to ensure efficiency
- Support the creation and upskilling of local creative talent

Policy Thrust 5(b): Enhance Malaysian content beyond borders

- Support market access actions for local content productions in targeted high-potential countries
- Encourage cooperation with foreign creative industry hubs

Policy actions that encourage sustainable local production and distribution will foster a vibrant ecosystem focused on creating content tailored for the Malaysian audience, but still relevant regionally or globally.
4.6 EMPOWERING TALENT

Revitalise digital talent empowered with knowledge, mindset and future skills

Empowered digital talent is essential in making the information society a stronger force towards the goal of inclusive and sustainable growth.

Three policy thrusts have been identified towards this aspiration:

Policy Thrust 6(a)
Embed ‘digital literacy by default’
- Expand exposure to digital skills programmes for ‘digital natives’
- Focus on upskilling ‘digital migrants’ for functional technology use to bridge the digital divide

Policy Thrust 6(b):
Reskill and upskill talents
- Retrain the existing workforce to remain relevant in the new wave of digital disruptions
- Equip the future workforce to make the best use of digital technologies to create value from the beginning

Policy Thrust 6(c):
Develop leading digital expertise
- Create an innovation culture among Malaysian talent
- Encourage specialisation in new digital topics to prepare for the next waves of disruption
Policy actions to empower the Rakyat will enable digital migrants to make full use of new information technology and will build a new generation of digital natives fully equipped to join the workforce. Encouraging a culture of innovation among Malaysian talent will allow Malaysia to become a value leader with higher ‘ability to win’ in selected areas.

**TARGETED OUTCOMES**

Delivering the programmes successfully will have an economic impact and create social benefits for the Rakyat. Measurable aspirational outcomes have been identified for each strategic imperative to measure progress towards the Blueprint vision.

Explicit goals have also been set for each of the 15 policy thrusts.

The following chapters provide greater detail on the 36 programmes that fall under the six strategic imperatives and their associated policy thrusts. The combined outcomes of the programmes will deliver the strategic imperatives and consequently the Blueprint vision. The targeted outcomes will be explained in the Program Charter.
### Figure 52: Aspirations of the 15 Policy Thrusts Across the Six Strategic Imperatives

<table>
<thead>
<tr>
<th>Strategic Imperative</th>
<th>Policy Thrust</th>
<th>2020 Outcome</th>
<th>2025 Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Connecting People</td>
<td>Build future-proof connectivity infrastructure for the nation</td>
<td>95% of populated areas covered with broadband infrastructure</td>
<td>Expand coverage of broadband infrastructure beyond 95% of populated areas</td>
</tr>
<tr>
<td></td>
<td>Enrich digital interactive participation for policy formulation</td>
<td>0.8% citizens engaged in policy ideation with government</td>
<td>1.6% citizens engaged in policy ideation with government</td>
</tr>
<tr>
<td>2 Strengthening Trust</td>
<td>Secure Malaysian digital space</td>
<td>Top 10 global ranking on the ITU Global Cybersecurity Index</td>
<td>Top 5 global ranking on the ITU Global Cybersecurity Index</td>
</tr>
<tr>
<td></td>
<td>Build a trusted identity for the digital world</td>
<td>30% digital identity penetration</td>
<td>85% digital identity penetration</td>
</tr>
<tr>
<td></td>
<td>Promote open data</td>
<td>Top 20 rank in open data barometer</td>
<td>Top 15 rank in open data barometer</td>
</tr>
<tr>
<td>3 Intensifying Engagement</td>
<td>Strengthen omnichannel government service delivery</td>
<td>Top 15 rank in UN’s Online Service Index</td>
<td>Top 15 rank in UN’s Online Service Index</td>
</tr>
<tr>
<td></td>
<td>Build targeted and personalised communication</td>
<td>60% faith in Malaysian institutions</td>
<td>63% faith in Malaysian institutions</td>
</tr>
<tr>
<td>4 Accelerating Innovation</td>
<td>Accelerate adoption of digital enablers</td>
<td>55% SMEs adopt advanced ICT tools and services</td>
<td>75% SMEs adopt advanced ICT tools and services</td>
</tr>
<tr>
<td></td>
<td>Spur innovation ecosystem</td>
<td>18.2% GDP contribution from digital economy</td>
<td>23% GDP contribution from digital economy</td>
</tr>
<tr>
<td></td>
<td>Adopt an agile policymaking approach</td>
<td>Top 30 rank in regulatory quality sub-index of Global Innovation Index</td>
<td>Top 25 rank in regulatory quality sub-index of Global Innovation Index</td>
</tr>
<tr>
<td>5 Catalysing Creativity</td>
<td>Revitalise local content production and distribution</td>
<td>20% of content consumed locally is Malaysian</td>
<td>30% of content consumed locally is Malaysian</td>
</tr>
<tr>
<td></td>
<td>Enhance Malaysian content beyond borders</td>
<td>Content export revenues of RM1.5 billion</td>
<td>Content export revenues of RM2.0 billion</td>
</tr>
<tr>
<td>6 Empowering Talent</td>
<td>Embed ‘digital literacy by default’</td>
<td>25% reduction in digital divide</td>
<td>50% reduction in digital divide</td>
</tr>
<tr>
<td></td>
<td>Reskill and upskill talents</td>
<td>ICT skills on par with literacy and numeracy</td>
<td>ICT skills on par with literacy and numeracy</td>
</tr>
<tr>
<td></td>
<td>Develop leading digital expertise</td>
<td>Top 20 rank in ICT-patent production globally</td>
<td>Top 15 rank in ICT-patent production globally</td>
</tr>
</tbody>
</table>

*Digital technology focus*  |  *Human development focus*  |
“As the world is now a highly connected place, so to would trade be; driven both digitally and physically. A society that doesn’t adopt and adapt to these changes will lose its competitive capability leading to the economy being challenged by others. The technology impact is a double edge sword; used strategically and rightly it helps previously less competitive countries to be more competitive.”

YB Datuk Seri Dr. Salleh Said Keruak
5th UNI Apro ICTS and Post & Logistics Conference, Kuala Lumpur
25 August 2017
CHAPTER 5

CONNECTING PEOPLE
The first **strategic imperative** is Connecting People. This imperative calls for two **policy thrusts**:

- **Build future-proof connectivity infrastructure**
  - Build ubiquitous infrastructure
  - Provide quality infrastructure
  - Ensure infrastructure affordability

- **Enrich digital interactive participation for policy formulation**

The programmes to support these policy thrusts are explained below.

## 5.1  **BUILD FUTURE-PROOF CONNECTIVITY INFRASTRUCTURE**

### Build Ubiquitous Infrastructure

Fixed broadband penetration in Malaysia grew 1.83 times between 2010 and 2015, from 24% to 44% of the population, as a result of national public-private partnership programmes such as High Speed Broadband and Broadband for General Population. Other complementary national programmes, such as the Universal Service Provision subsidies and Sub-Urban Broadband Project (SUBB), have boosted internet use.

If historical trends continue unchanged, approximately 93% of populated areas will be covered by 2020, below the RMK-11 target of 95% coverage. This highlights the need for the action by the industry in coordination with public sector to plan ahead.

Four programmes have been identified to help achieve the vision of ubiquitous, affordable and high-speed infrastructure for the nation:

- **Network planning** - Enforce and monitor infrastructure rollout towards the achievement of connectivity targets
- **Infrastructure rollout facilitation** - Ensure alignment among all stakeholders, federal and state, to expedite infrastructure rollout
- **Innovative technologies for reach** - Build private partnerships to explore innovative approaches to meet the needs of difficult-to-reach communities
- **Analogue switch-off** - Develop a contingency plan to ensure timely analogue switch-off and realisation of the digital dividend

### 5.1.1 Network Planning

The network planning programme will seek to design and develop high-level fixed and wireless infrastructure rollout plans to meet connectivity targets.

As previously noted, historical trends suggest that approximately 93% of populated areas will be covered by 2020, below the RMK-11 target of 95% coverage. To go beyond the projected 93% coverage rate will require, first, the development of fixed and wireless infrastructure rollout plans to meet connectivity targets, as well as oversight and action to identify and address deviations.
<table>
<thead>
<tr>
<th>Initiatives</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and develop rollout plan (high-level by state, detailed planning and phases of rollout)</td>
<td>Malaysian Communications and Multimedia Commission (MCMC), Industry</td>
</tr>
<tr>
<td>- Wireless Broadband Rollout Plan</td>
<td></td>
</tr>
<tr>
<td>- Fixed Broadband Rollout Plan</td>
<td></td>
</tr>
<tr>
<td>Monitor rollout plan and act to address deviations</td>
<td>MCMC</td>
</tr>
<tr>
<td>- Leverage available regulatory and policy instruments to facilitate cooperation from industry players</td>
<td></td>
</tr>
</tbody>
</table>

Regular engagements with state governments and local authorities on rollout planning will be necessary to ensure buy-in and facilitate approval procedures.

5.1.2 Infrastructure Rollout Facilitation

The infrastructure rollout facilitation programme will strive to ease right-of-way for industry access and to coordinate infrastructure rollout objectives with federal and state authorities.

Facilitative right-of-way policies and procedures at both federal and state levels will help to speed the rollout of fixed and wireless broadband connectivity infrastructure. This will bring clear benefits to local populations, as increases in both broadband penetration and internet use have been shown to have significant economic benefits. Accelerating infrastructure rollout can hasten the accrual of these benefits.

The initiatives are: first, to engage various public actors to influence policy to ease right-of-way; and second, to expedite the process by addressing major roadblocks to infrastructure in the right forums.

51. Across fixed and mobile technologies
52. Broadband penetration rate correlated with GNI per capita; 1.38 percentage point increase in GNI due to a 10 percent increase in broadband penetration
53. Kementerian Kesejahteraan Bandar, Perumahan dan Kerajaan Tempatan / Ministry of Urban Wellbeing, Housing and Local Government
54. Jabatan Perancangan Bandar dan Desa / Federal Department of Town and Country Planning Peninsular Malaysia
55. Town Council Planning Act, review approvals for local telco infra installation
56. Street Drainage and Building Act 1976, coordinate to exempt low impact communications infrastructure from requirements of act
57. As an example, small radio and telecommunication dishes and extensions to existing telco towers to a limited extent, are defined as low impact in some jurisdictions
58. Uniform Building By Laws 1984, some states are yet to gazette amendments by KPKT and implement on ground
59. Ad-hoc fora and other fora with KKMM participation
60. Engage the Director General of Land and Mines through forums such as Mesyuarat Jawatankuasa Induk Pemantauan Tanah Persekutuan / Federal Land Monitoring Committee to address delays in acquisition of federal government land
5.1.3 Innovative Technologies for Reach

In this context, ‘innovative technologies’ refer to unconventional approaches to connecting communities to improve affordability of online access, and reach rural communities beyond areas where conventional methods (such as copper, cable, fibre, 3G/4G) are not economically viable.

Working towards inclusive development means finding affordable methods to provide broadband connectivity for the remaining difficult-to-reach population, beyond the RMK-11 coverage target of 95% of the population.

Setting up a dedicated team to build private partnerships that provide innovative access to technologies will help achieve the goal of providing online access to rural and unconnected communities.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
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</thead>
<tbody>
<tr>
<td>Determine remote areas that are not economically viable by conventional methods (areas beyond RMK-11’s 95 percent target)</td>
<td>KKMM, Industry</td>
</tr>
<tr>
<td>- Identify next best technologies that help improve internet access</td>
<td></td>
</tr>
<tr>
<td>- Develop industry partnerships, outline and roll out proof of concept</td>
<td></td>
</tr>
<tr>
<td>- Secure legal and regulatory approvals for proof of concept and rollouts</td>
<td></td>
</tr>
</tbody>
</table>
What is spectrum?

Wireless telecommunication uses electromagnetic waves or spectrum to provide connectivity. All wireless communication uses electromagnet waves, such as mobile phones, Wi-Fi, broadcast television broadcast, radio, and satellite phones.

Spectrum is a limited resource. Physical laws naturally limit the amount of spectrum available for telecommunications use. Users on the same radio frequencies for different usage can interfere with each other. The use of spectrum is therefore generally regulated by national regulatory bodies and coordinated internationally through the International Telecommunications Union (ITU). The Malaysian Communications And Multimedia Commission (MCMC) manages spectrum allocation for telecommunication use in Malaysia.

Compared to other nations, Malaysia has one of the highest amounts of spectrum allocated for mobile service.
Improving engagement through communication campaigns for the adoption of digital TV is a critical enabler for timely analogue switch-off. Following the analogue switch off, re-stacking of TV frequencies is required before digital dividend can be realised.

5.1.4 Analogue Switch-Off

The objectives of the analogue switch-off programme are to encourage efficient spectrum usage in Malaysia, and to provide greater ability to cover low-density areas with the release of additional frequencies for telecommunication use.

Digital dividend benefits in the UK were estimated to reach between GBP 2 – 3 billion\(^1\). Re-farming spectrum released from the analogue switch-off for telecommunication use also contributes to inclusive development, and the inherent characteristics of this spectrum make it well-suited to boosting wireless broadband coverage in low-density rural areas. Malaysia constituted the National Digital Task Force (NDTF) under the chairmanship of the Secretary General, KKMM to coordinate successful digital switch over across government agencies and sector players. The NDTF includes participation from KKMM and its agencies, Ministry of Finance, Economic Planning Unit and broadcasters. Reporting to the Minister of Communications and Multimedia, the NDTF is empowered to establish and recommend policies on digital switchover.

A review of the analogue switch-off experiences in other countries indicates that adoption barriers can interfere with timely completion, as segments of the population resist migration to digital service, creating delays. Contingency plans may be needed to ensure timely analogue switch-off in Malaysia.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continue efforts towards timely analogue-switch-off and enforce current target timeline</td>
<td>National Digital Task Force (NDTF)(^2)</td>
</tr>
<tr>
<td>Build contingency plans to mitigate risk of delay, such as:</td>
<td></td>
</tr>
<tr>
<td>- Distribution of subsidised receivers</td>
<td></td>
</tr>
<tr>
<td>- Communication plans to address low Digital Terrestrial Television (DTT) adoption</td>
<td></td>
</tr>
<tr>
<td>Set up early warning systems to monitor adoption, such as a survey to measure DTT adoption and setting distribution KPIs</td>
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</table>

Improving engagement through communication campaigns for the adoption of digital TV is a critical enabler for timely analogue switch-off. Following the analogue switch off, re-stacking of TV frequencies is required before digital dividend can be realised.

---

\(^1\) Ofcom, 2009
\(^2\) National Digital Taskforce
What is the digital dividend?

‘Digital dividend’ is the additional spectrum freed up after analogue television broadcasting switches to more efficient digital terrestrial television (DTT) technologies. DTT consumes less spectrum while offering a better-quality television experience. Re-purposing spectrum released from the move to DTT for telecommunication will boost broadband coverage in low-density areas, as the inherent characteristics of the digital dividend make it well-suited for wide coverage, unlocking value creation. According to a 2010 forecast by GSMA, the digital dividend in Asia Pacific could be worth almost USD1 trillion by 2020, with the economic value coming from increases in GDP growth, job creation and entrepreneurship.

Malaysia has taken actions towards capturing value from the digital dividend. In 2013, Malaysia, Brunei, Indonesia, and Singapore jointly decided to coordinate their use of the digital dividend through the Asia Pacific Telecommunity 700 Mhz band plan. Digital Terrestrial Television rollout is currently underway in Malaysia, with plans to complete analogue switch-off by 2018.

Incremental GDP benefit from allocation of digital divided to mobile use over broadcasting

Note: NPV discounted by study country government security rates for each cluster; 1.5% for South Korea, 2.8% for Malaysia, 4.0% for Indonesia and 5.0% for India

The Quality of Service Standards is created to ensure that consumers are given satisfactory level of services that meet minimum and acceptable standards, as well as to protect and enhance the rights of consumers in obtaining quality services.

- **Provide Quality Infrastructure**

Malaysia has developed a Quality of Service (QoS) Blueprint in recent years to increase competitiveness of quality. QoS standards for broadband incorporate measures of latency, throughput and packet loss; that is, how much time it takes to transmit data, how much data is transmitted, and how much data is lost in the process. A proactive monitoring and enforcement blueprint is in place, with RM480,000 in penalties issued in 2015.\(^{63}\)

Explosive growth in data usage is projected with, mobile data demand forecast to grow at a 55% compound annual growth rate (CAGR)\(^{64}\), leading to an increase of approximately 900% by 2021. Similarly, the demand for internet bandwidth is projected to increase at approximately 27% CAGR\(^{65}\) to 2020.

The International Telecommunications Union ranked Malaysia 89 of 175 for international internet capacity in 2016\(^{66}\), underlining the need to plan ahead to ensure adequate international connectivity to keep pace with growth in data demand.

In addition to capacity needs, network performance has the opportunity to improve in anticipation of emerging quality-sensitive applications\(^{67}\).

Two infrastructure quality programmes have been identified to address domestic infrastructure levers and constraints on access to international bandwidth.

\(^{63}\) Malaysian Communications and Multimedia Commission (MCMC)  
\(^{64}\) Ericsson Mobility Report, 2016  
\(^{65}\) Cisco Visual Networking Index, 2015  
\(^{66}\) International Telecommunications Union, 2016  
\(^{67}\) For example, connected cars and smart cities
What is Quality of Service?

Ever wondered if your 10Mbps broadband connection delivers what you have paid for?

Quality of Service (QoS) standards imposed by regulators answer this question, and set out minimum requirements for performance by providers. In Malaysia, the Malaysian Communications and Multimedia Commission (MCMC) sets out and enforces quality of service standards for broadband providers.

Typical performance standards imposed on broadband provider’s measure customer experience through one or more of the following:

- **Throughput**: Tracks actual performance of download speeds compared to bandwidth promised at time of sign-up
- **Latency**: Measures the time it takes for a packet to reach a consumer over the provider’s network. Excessive delays can render latency-sensitive applications such as voice over internet protocol (VOIP) or online gaming unusable
- **Packet loss**: Measures the percentage of data that is dropped in transit over the network

Studies show that, once speeds reach 1.5Mbps, further speed increases have little or no impact on users perception of performance. Across all usage on cellular networks, latency does have an impact on satisfaction and that impact is significant.

Note: Kbps = kilobits per second. Latency is the amount of time (measured in milliseconds) it takes data to get from its source to its destination. It is the delay users experience while waiting for a video stream to start, for example.

Source: BCG proprietary study and mobile app
5.1.5 Local Infrastructure Quality

The objective of the infrastructure quality programme is to promote competition on quality through increased transparency on performance of industry players in the market.

Improving compliance to minimum standards for QoS performance will enable Malaysia to prepare for future quality-sensitive applications. The two programme recommendations are: to refine the minimum quality of service standards; and to publish interactive dashboards that report on quality of service.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refine minimum standards for QoS performance</td>
<td>MCMC</td>
</tr>
<tr>
<td>Manage and monitor QoS performance for fixed and mobile broadband against targets</td>
<td>MCMC</td>
</tr>
<tr>
<td>Publish QoS results annually</td>
<td></td>
</tr>
</tbody>
</table>

Enabling strategies include developing internal skills to manage the technical aspects of dashboards, including regular testing to ensure updated and accurate information, and conducting a communication campaign to build public awareness about QoS information.

5.1.6 International Connectivity

The objectives of the international connectivity programme is to design a submarine cable blueprint to improve connectivity bandwidth between Malaysia and the rest of the world, and to improve service delivery in various bandwidth intensive sectors such as education and entertainment in the process.

The International Telecommunications Union (ITU) placed Malaysia 89 of 175 for international internet capacity in 2015\(^{68}\), while internet traffic is expected to grow at approximately 27% annually over the next four years\(^{69}\), underlining the need to plan ahead to ensure adequate international connectivity.

The recommendation to implement this programme is to enhance connectivity through submarine cable projects to address forecast increase in demand.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhance connectivity through submarine cable projects</td>
<td>MCMC, with support of Industry</td>
</tr>
<tr>
<td>- Asia-Africa-Europe</td>
<td></td>
</tr>
<tr>
<td>- Asia Pacific Gateway</td>
<td></td>
</tr>
<tr>
<td>- Sistem Kabel Rakyat 1Malaysia</td>
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</table>

- Ensure Infrastructure Affordability

Fixed and mobile broadband prices in Malaysia have declined progressively over the years. The cost of a 1 Mbps connection declined 21% from 2010 to 2016, and stands at 2.1% of GNI per capita today\(^{70}\). Mobile broadband prices have declined 6 percent since 2012 and stood at 1.6% of GNI per capita\(^{71}\) in 2014, with further declines in the last two years.

However, higher-speed fixed plans are relatively expensive, with the median 50 Mbps plan costing approximately 6% of GNI per capita. Reduced affordability of higher-speed broadband has led to low use of higher-speed broadband in Malaysia, with 89% of Malaysian subscribers using broadband connections slower than 10 Mbps\(^{72}\).

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\(^{68}\) International Telecommunications Union, 2016  
\(^{69}\) Internet traffic growth, Cisco Visual Networking Index, 2015  
\(^{71}\) Cost of a 1.5 GB data plan used as a proxy, data from International Telecommunications Union  
\(^{72}\) BCG analysis of data from Akamai – State of Internet, Q1 2016
Employing market transparency

Market efficiency and competition are powerful forces that can foster optimal outcomes. Transparency – in essence, the widespread availability of information on prices and quality of goods – is widely seen as essential to allow market forces to produce optimal outcomes. Telecommunication regulators in many jurisdictions employ market forces in different ways to encourage better outcomes. Two of these are affordability and quality of service.

Telecommunication pricing plans are complex and not easily compared. Furthermore, not all providers offer services in all areas. In UK, the regulator has acted to increase visibility on available plans and prices in a detailed way that enables consumers to check available plans and easily compare prices and offers across providers. This system promotes consumer choice and increases pressure on operators to provide best prices on services.

Another area in which transparency can help boost healthy competition is quality of service. Quality of service (QoS) can be difficult to understand or compare across providers in the market. Recognising this, Singapore launched a programme to crowdsource detailed QoS performance data and publish collected data in an easily comparable way to promote competition on quality.

Source: Infocomm Meida Development Authority, Ofcom, Broadband.co.uk, Press reports
It may be possible to capture additional economic value through increased affordability and usage of faster broadband. Economic studies have demonstrated that doubling broadband speeds can add 0.3% to national GDP.

An infrastructure affordability programme to advance the vision of affordable infrastructure for the nation is described below.

**5.1.7 Infrastructure Affordability**

The infrastructure affordability programme aims to ensure accessible fixed broadband prices in order to increase adoption among Malaysians, especially for higher-speed plans, and to meet broadband affordability targets in RMK-11.

The recommendations are to: first, manage and monitor prices of fixed and mobile broadband against targets; and second, to gradually increase the affordability of higher-speed broadband over the long term through an improved access pricing blueprint.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage and monitor prices of fixed broadband against targets</td>
<td>MCMC</td>
</tr>
<tr>
<td>Refine strategy to ensure longer-term lowering of prices through an improved Access Pricing Blueprint, in accordance with RMK-11</td>
<td></td>
</tr>
</tbody>
</table>

**5.2 ENRICH DIGITAL INTERACTIVE PARTICIPATION FOR POLICY FORMULATION**

Malaysia has an extensive postal network of 96,333 post boxes. POS Malaysia has found ways to boost the economic and social value of the postal network in several ways. Examples include:

- Post offices can be a channel for government service delivery, such as renewal of driving licenses
- The Smart Postman programme empowers postmen to collect data that government agencies can use to improve service delivery

The nationwide ground-level presence of the postal network offers an opportunity for postmen to play a critical role as an orchestrator of local communities and an additional channel to hear the Rakyat’s voice. This form of direct connection with citizens is not new to the Malaysian government. Previously Malaysia has launched public consultation on the annual budget.

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73. Chalmers University of Technology, Ericsson and Arthur D. Little, 2013
74. RMK-11 affordability target for fixed broadband is at one percent of GNI per capita by 2020.
Refining minimum standards for QoS performance will enable Malaysia to prepare for future quality-sensitive applications.

Government may be able to build deeper connections and improve two-way interaction by expanding to topics beyond the budget, and by increasing citizens’ participation in the decision-making process. Two programmes are recommended to advance this policy thrust:

- **Community orchestrators** - empower postmen in local communities to take on new roles as orchestrators
- **Multiple helix exchange** - participative policymaking tool that would engage citizens on critical policy topics.

### 5.2.1 Community Orchestrators

The Community Orchestrators programme’s objective is to empower community representatives and catalyse their role as information managers within local communities.

Malaysia has 926 post offices and more than 8,000 postal carriers across the country. This extensive network of post offices and postal carriers offers a granular presence in local communities that can be tapped in two ways. Firstly, the network of postal carriers possesses intimate knowledge of the local community and social links which can be used to build their role as community orchestrators who can capture effectively and echo community concerns. Secondly, the network of post offices can serve as centres of social exchange and permanent points of presence to effectively disseminate important government messages and services to the public.

Additionally, this can increase value creation at the post office level, further evolving it into a district e-commerce hub for SMEs to support the digital economy agenda.

In this light, there is an opportunity to enhance the role of postal carriers in their local communities as orchestrators, and to facilitate the growth of post offices into centres of social exchange and points of social contact, especially in isolated areas and remote communities.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevate role of postmen in local community to act as community orchestrators:</td>
<td>POS Malaysia, MCMC, KKMM</td>
</tr>
<tr>
<td>- Extend enablement tools to all postmen, such as smart postman application</td>
<td></td>
</tr>
<tr>
<td>- Enable action based on local feedback from postmen about local problems</td>
<td></td>
</tr>
<tr>
<td>Grow post office as centre of social exchange</td>
<td></td>
</tr>
<tr>
<td>- Diversify government services offered through post office</td>
<td></td>
</tr>
<tr>
<td>- Use post offices as permanent dissemination points for government messages</td>
<td></td>
</tr>
<tr>
<td>- Develop post offices as a District e-commerce Hub for SMEs to support the Digital Economy agenda</td>
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</tbody>
</table>
5.2.2 Multiple Helix Exchange

This programme will seek to implement multiple helix exchange among government, industry, civil society, academia and Rakyat in addressing public policy challenges in C&M sector.

This is a pragmatic way to strengthen trust and foster inclusion in the policymaking process.

To implement this programme, the recommendation is to develop an interactive and participative policymaking ‘Multiple Helix Exchange’ tool to give all citizens the opportunity to engage directly in the policymaking process for strategic topics.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and develop the ‘Multiple Helix Exchange’ participative policymaking tool to engage citizens on important policy topics (offline and online)</td>
<td>KKMM with support from MDEC, JAPEN, JASA</td>
</tr>
<tr>
<td>Finalise mechanism for ‘Multiple Helix Exchange’</td>
<td></td>
</tr>
<tr>
<td>- Minimum threshold votes required per idea, with top three monthly ideas presented to MPT</td>
<td></td>
</tr>
<tr>
<td>- Elevate ideas with cross-ministry implications to the Secretary General's Office (KSU) forum chaired by KSN to secure execution support</td>
<td></td>
</tr>
<tr>
<td>Pilot and roll out system nationally (offline in stages)</td>
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</table>

This programme can benefit from three enabling strategies. Firstly, internal information technology team skills need to be enhanced in order to manage the technical aspects of the interactive online portal, including regular testing to ensure the team's knowledge is accurate and up-to-date. Secondly, a wide-reaching communication campaign is needed to build public awareness of the ‘Ideas Exchange’ programme. Finally, sustaining the programme will require regular engagements with the working group to review and monitor potential ideas.
Discussion Box

How can governments improve two-way citizen engagement?

South Korea’s ‘Oasis of 10 Million Imaginations’ involved citizens in the policymaking process by soliciting proposals, ideas and opinions through an interactive online portal. Citizens proposed ideas across themes on the website, with their proposals open for votes by others. During the process, local governments reviewed all proposals that received more than 10 votes, and were required to share the status and plans of proposals through social media. Citizens who made the top three most popular proposals were given the opportunity to work with public employees to translate their policy ideas into reality.

Source: oasis.seoul.go.kr
CHAPTER 6

STRENGTHENING TRUST
The second strategic imperative is Strengthening Trust. Under this imperative, three policy thrusts will enable Malaysia to strengthen its trust advantage in a convenient, data-enriched and secured cyberspace:

- Secure Malaysian cyberspace
- Build a trusted identity for the digital world
- Promote open data

The following section describes programmes to fulfil the policy thrusts.

6.1 SECURE MALAYSIAN CYBERSPACE

The vulnerabilities of and threats to the ICT infrastructure of critical systems are genuine, diversified and growing. The government of Malaysia has committed to not only embrace and develop ICT technology, but at the same time ensure that this is done in a manner that is beneficial and aligned to the nation’s sovereignty and vital interests.

The government has recognised cyber security as a national priority by formulating the National Cyber Security Policy (NCSP) in 2016 to address the risks to the Critical National Information Infrastructure (CNII). The CNII sectors are National Defence and Security; Banking and Finance; Information and Communications; Energy; Transportation; Water; Health Services; Government; Emergency Services; and Food and Agriculture.

The NCSP recognises the critical and highly interdependent nature of the CNII and aims to develop and establish a comprehensive programme and a series of frameworks that will ensure the effectiveness of cyber security controls over vital assets. It has been developed to ensure that the CNII are protected to a level that commensurate the risks faced.

These and other efforts place Malaysia third on ITU’s Global Cybersecurity Index, ahead of benchmark countries such as South Korea, United Kingdom and Japan.

Malaysia, however, is subject to ever-rising threats. A 2016 National Exposure Index issued by Rapid7 ranks Malaysia at 31, which calls for continued efforts to strengthen cyber security.

The Government of Malaysia has established the National Cyber Security Agency (NACSA), a dedicated agency that oversees all national cyber security functions formed under the aegis of the National Security Council of Malaysia. NACSA is the lead agency that integrates the existing cyber security capabilities through a strategic and coordinated manner. NACSA gathers all identified national cyber security experts under one roof and coordinates and collaborates with its domestic and international counterparts, from both the public and private sectors.

The mandates given to NACSA are to formulate, monitor, coordinate and synchronise implementation of cyber security policy, framework and strategy to safeguard the government, the Critical National Information Infrastructure (CNII), businesses and the public at large, talent development, as well as coordination of issues on legislation and enforcement in collaboration with all the relevant entities.

Since security is one of the essential element in ensuring trust, the initiatives under this Blueprint needs to be implemented hand in hand with the initiatives conducted by NACSA to effectively manage the cyber security environment in Malaysia.

While elements of a security foundation are in place, cyber security measures can be further strengthened in light of increasing threats.
Two programmes have been envisioned to secure the C&M sector and to expand coverage to the weakest linked individuals and institutions, given an increasingly connected ecosystem:

- **Cyber security standards** - Build C&M sector-specific cyber security codes in accordance with national policy and expand network security codes to adjacent sectors
- **Cyber security capability building** - Promote general awareness and a culture of cyber safety across the ecosystem, specifically targeting vulnerable segments

### 6.1.1 Cyber Security Standards

The objective of the Cyber Security Standards programme is to guarantee a safe and secured digital Malaysia market, and to develop the C&M sector’s resiliency to cyberthreats.

The C&M sector has a prominent role in securing critical national infrastructure as the provider of nationwide connectivity.

Recommendations for implementing this programme are to develop cyber security codes specific to the C&M sector, and to collaborate with relevant sector regulators to enforce the adoption of these cyber security codes.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
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<tbody>
<tr>
<td>Establish forum to build C&amp;M sector specific cyber security codes in accordance with national policy</td>
<td>MCMC, NACSA</td>
</tr>
<tr>
<td>- Create C&amp;M sector specific codes including control elements such as the minimum number of certified security staff, standards for compliance, and audit procedures</td>
<td></td>
</tr>
<tr>
<td>Open participation in the forum to representatives of concerned non-C&amp;M participants such as the government and utilities</td>
<td>MCMC, NACSA</td>
</tr>
<tr>
<td>- Expand network security codes, disseminate know-how to adjacent sectors</td>
<td></td>
</tr>
<tr>
<td>- Engage agencies to facilitate expansion efforts</td>
<td>KKMM, NACSA</td>
</tr>
</tbody>
</table>

During execution, it is critical to secure participation of regulators and ministries from adjacent sectors in the cyber security forum for standards development, in order to facilitate expansion efforts across the ecosystem.

### 6.1.2 Cyber Security Capability Building

The objective of the cyber security capability building programme is to develop Malaysia’s cyber security human capital and increase awareness of cyber security measures among the general public, the private sector, and the government.

In addition to protecting infrastructure integrity, safe cyber practices among the *Rakyat*, government and businesses are necessary for strong cyber security. Certain population segments, such as schoolchildren and small and medium enterprises (SMEs), are particularly vulnerable. Civil servants who handle and process sensitive and confidential information are also at higher risk. Efforts to secure these at-risk segments need strengthening.

Two recommendations to help build cyber security capability are to promote general awareness and a culture of cyber safety among vulnerable and threatened user groups, such as students, parents, SMEs, and civil servants; and to deploy parental controls for children and students online.

Enabling strategies for the following programmes include engaging and obtaining support from regulators and government bodies such as Ministry of Human Resources (MOHR), Department of Skills (JPK), *Pembangunan Sumber Manusia Berhad* (PSMB), and Ministry of Education (MOE) to raise awareness of the need to secure cyberspace, and re-emphasise the importance of cyber security measures.
**6.2 BUILD A TRUSTED IDENTITY FOR THE DIGITAL WORLD**

Malaysia has taken a number of actions to build trust in online transactions and increase the use of e-Services. A robust Public Key Infrastructure, integrated with the MyKad and enabling regulations such as the Digital Signature Act, makes it easier to use online services securely.

Despite these measures, Malaysians are the third most concerned worldwide about online security and privacy. 40% of respondents surveyed reported that they might stop accessing government services out of fear that personal information might be stolen. A secure national digital identity can bridge this trust gap and encourage greater use of online services, benefitting both the government and the private sector.

A move to online services is estimated to save Malaysia RM1.08 billion in customer servicing costs over five years. Two programmes have been identified to deliver on these objectives:

- **Trusted digital identity** - an official authentication method that can be used by both the government and the private sector
- **Digital trust index** - to measure and monitor trust levels in the digital space

### 6.2.1 Trusted Digital Identity

The trusted identity programme has three objectives. Firstly, the programme seeks to develop digital identity as an official national authentication method for Malaysia. Secondly, it seeks to generate trust in both public and private digital services in order to increase usage. Thirdly, it aims to reduce the transaction cost of services offered by government and the private sector, by facilitating a move to online transactions.
What is digital identity?

A digital identity connects identity owners with identity consumers, and serves as a secure mechanism to establish identities online. Establishing online identity is a pre-requisite for delivering most digital services.

The major participants in the digital identity ecosystem are:

- **Owners:** Typically end users of digital services, owners register for digital identities to access a variety of services such as online banking and government online services.
- **Issuers:** Provide digital identities to owners, and provide interfaces for authentication services to consumers of digital identity. In addition to private actors, governments have a role to play in issuing identities, as has been the case in developed nations such as Australia, New Zealand and Singapore.
- **Consumers:** Service providers, both private and public, are consumers of digital identity services. Consumers can either rely on self-issued digital identities, or consume digital identification services provided by third-party issuers.
A secure national digital identity can strengthen trust and encourage greater use of online services, benefitting both the government and the private sector.

The four initiatives recommended for this programme are to establish a clear mandate to build a national digital identity for Malaysia; and to set up an interagency body to build this digital identity, execute the digital identity agenda, and remove barriers to digital identity use.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set up cross-agency task force to manage project, perform detailed design, and define business case</td>
<td>MCMC with support from MAMPU for government services</td>
</tr>
<tr>
<td>Develop a common national digital identity standard, policies, processes, governance and controls, and build digital identity platform</td>
<td></td>
</tr>
<tr>
<td>Advocate policies that encourage digital identity use across ministries and agencies</td>
<td></td>
</tr>
<tr>
<td>Roll out use of digital identity to private sector and government services (federal or local) as well to potential cross-border applications as and when relevant</td>
<td></td>
</tr>
</tbody>
</table>

This programme will benefit from wider support of other government agencies such as MDEC and BNM to promote development of a secure national digital identity. We can foster take-up of digital identity by encouraging clear communications with public and private institutions on the benefits of moving to a single authentication platform; requiring government agency sign-up for digital identity programmes; and encouraging the private sector to sign up for digital identity, with mandates for critical sectors such as financial services.

### 6.2.2 Digital Trust Index

While there is broad consensus on the importance of digital trust, widely acknowledged, there are no comprehensive measures.

The establishment of a digital trust index will provide a way to monitor the level of trust in digital, and identify the need for corrective actions, to support a trusted cyberspace.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
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</thead>
<tbody>
<tr>
<td>Build a digital trust index blueprint</td>
<td>MCMC</td>
</tr>
<tr>
<td>Execute index and monitor outcomes to identify need for corrective actions to strengthen trust</td>
<td></td>
</tr>
</tbody>
</table>
6.3 PROMOTE OPEN DATA

Governments worldwide see value in open public data with at least 92 open government data programmes worldwide in 2015\textsuperscript{82}. Malaysia has followed suit with data.gov.my, launched in 2014, featuring more than 1,692 data sets\textsuperscript{83}.

To fully realise the value of open data, MAMPU has undertaken the Government Data Optimisation Transformation Services (GDOTS) programme, focusing on data-driven initiatives such as open data and Big Data Analytics (BDA). GDOTS aims to establish Public Sector Data Oceans to harness data for decision making, policy formulation and to identify opportunities for efficiency in government service delivery.

Despite these efforts, Malaysia’s open data programme ranked 51 of 92 countries\textsuperscript{84} in 2015, behind regional peers such as Singapore, Indonesia and the Philippines. Malaysia’s rank can be improved by reviewing relevant existing policies and legislation to allow access for Industry, NGOs, Malaysian citizens, as appropriate, to government information. Open industry data efforts have yet to take off in Malaysia, and open private data offers untapped economic and social potential when compared to global benchmarks. Additionally, Malaysia is investing in national efforts to drive the development of Internet of Things (IoT)\textsuperscript{85}. The proliferation of IoT has the potential to increase the variety and volume of available open data.

- **Open data** - to foster transparency and strengthen trust through actions to improve quality of data in data.gov.my, and to expand existing open data to the commercial sector through an industry data marketplace. Fully realising value from data will require robust safeguards to ensure that the flow of data continues unimpeded
  - **Personal data protection** - to expand coverage of data protection for a trusted flow of data

6.3.1 Open Data

The open data programme’s objectives are to improve the quality of the government’s open data programme; to expand existing open data initiatives to the commercial sector; and to help generate economic and social value through open data use.

A study of the Open Data Barometer score reveals that the largest opportunities for Malaysia to improve against its peers\textsuperscript{86} are in areas of data quality and socio-economic impact from open data re-use. Key data areas that Malaysia could improve on are crime statistics, company registration, national election results, legislation, public contracts, and land ownership data.

Recommendations for the open data programme are to firstly, strengthen the quality and coverage of open government data by reinforcing policy guidelines on open data performance; secondly, to create a pilot industry open data model with the private sector; and thirdly, to develop a data marketplace and data Application Programming Interfaces (APIs) with the ability to enable open data use especially for emerging applications, such as IoT.

\textsuperscript{82} Open Data Barometer, 2015
\textsuperscript{83} MAMPU, As of January 2017
\textsuperscript{84} Open Data Barometer, 2015
\textsuperscript{85} For instance the, National Internet of Things (IoT) Strategic Roadmap, MOSTI
\textsuperscript{86} Australia, Japan, Singapore, Philippines, Indonesia and Thailand used as peer group
### 6.3.2 Personal Data Protection

Studies show that given sufficient privacy controls and benefits, most consumers are willing to share personal data\(^{88}\). Conversely, failing to establish trust in data use will curtail data flows and restrict reuse, significantly limiting the value captured.

This programme seeks to expand coverage of personal data protection guidelines to facilitate data reuse and provide adequate protection from abuse for consumers.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extend coverage of existing data personal data protection laws to all sectors and all uses (including non-commercial use)</td>
<td>Department of Personal Data Protection (JPDP)</td>
</tr>
<tr>
<td><strong>Promote awareness of PDP laws to build trust</strong></td>
<td></td>
</tr>
<tr>
<td>- Conduct public awareness campaigns on provisions to public and under penetrated segments (SMEs)</td>
<td></td>
</tr>
<tr>
<td>- Reporting / redress mechanisms to assist enforcement</td>
<td></td>
</tr>
<tr>
<td>- Publish outcomes of enforcement actions as an additional incentive to comply</td>
<td></td>
</tr>
</tbody>
</table>

Strategies to enable these recommendations include strengthening human capital by recruiting data scientists and anonymisation experts to make the right data fields and formats available; providing guidance and expert advice to industry participants; and promoting the benefits of opening up and trading commercial data across sectors to ensure increased participation in the industry data marketplace.

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87. Application Programming Interfaces, to access, consume and manipulate data

Digitise and Humanise

Discussion Box

What is open data?

The Open Data Institute (ODI) defines open data as ‘data that anyone can access, use or share’. As digitisation increases, the amount of data collected and processed by governments and organisations has grown exponentially. Estimates put the size of the digital universe at 2.7 zettabytes\textsuperscript{89}, with 90 percent of this data estimated to have been created in just the last two years\textsuperscript{90}. Open data programmes seek to release this data beyond organisational boundaries and make it available for reuse free of cost.

Open data creates economic value from data reuse. A 2011 Information Economics study estimated that the direct and indirect contributions of Open Public Sector Data to the European Union total €140 billion annually\textsuperscript{91}.

Open government data efforts have been driven by many objectives, chiefly building economic value, transparency, accountability, and public participation. Malaysia launched its Open Data programme in 2014 and more than 1,400 datasets are now available online. Private sector organisations have increasingly begun to participate in open data programmes.

MAMPU and MDEC have combined efforts to launch Open Government data

Two key initiatives to spur adoption

1. Collaboration with ODI
   - Key strategic advisor to the UK Government
   - Provide data sets in the right format (machine readable) and on par with international standards

2. National Open data Champions
   - 31 individuals identified across 6 ministries and agencies (e.g. KKMM, MOF, DOS, SPAD)
   - Responsibilities:
     - Identify high-impact projects
     - Identify data required for the development of solutions
     - Share high-quality data

\textsuperscript{89} 10^9 Terabytes
\textsuperscript{90} Gartner
\textsuperscript{91} Information Economics, Review of Recent Studies on PSI Re-Use and Related Market Developments
CHAPTER 7

INTENSIFYING ENGAGEMENT
The third strategic imperative is Intensifying Engagement. Citizen engagement is delivered in two primary contexts: government service delivery and information communications.

Two policy thrusts draw on communications and multimedia advances to renew government engagement through people-centric communications:

- Strengthen omnichannel government service delivery
- Build a two-way high-resolution communications

7.1 STRENGTHEN OMNICHANNEL GOVERNMENT SERVICE DELIVERY

Rakyat are increasingly using online government services. In 2015, 44% of Malaysians reported using online government services at least once a week, up 6 percentage points from 2014. In recognition of high demand for online government services, MAMPU has driven the initiatives to boost digital delivery, which resulted in 87% of government services available online. In addition to increasing digitisation, MAMPU has also been working to improve the quality of government services. In 2013, for example, MAMPU issued a Public Sector Blueprint for Enterprise Architecture (1GovEA), and in 2015 MAMPU started the development and establishment of the Public Sector EA Office and the Public Sector EA Repository. MAMPU will drive the establishment of EA Offices in all ministries, catalysing the culture of EA practice.

Despite these improvements, 43% of Malaysians perceive government digital services to be of lower quality than private sector services, compared to only 8% who believe government services to be best-in-class, presenting an opportunity to strengthen service delivery. Transforming government services with a ‘Digital First, Citizen Focus’ will drive efforts to become more responsive to citizens’ needs, make citizens’ interaction with government easier, and give a greater voice to citizens on matters of public policy.

With increasing digitisation and pervasive technology use, the demand for smart services is expected to grow exponentially. Smart services encompass ongoing smart cities, smart communities, smart energy, smart waste and other government and private sector-delivered services. As an illustration of the growth potential, the smart community market in Asia Pacific is expected to grow at approximately 17% CAGR to 2020, and reach a market size of approximately USD5.5 billion by 2020. In Malaysia, several national agencies are undertaking smart services efforts, including the KKMM, MCMC, MDEC, the Ministry of Science, Technology and Innovation (MOSTI), and the Malaysia Industry-Government Group for High Technology (MIGHT). Coordination of cross-agency efforts towards inter-operability will foster industry development and provide economies of scale.

Two programmes have been identified to accelerate and broaden the creation of digital government services and bridge capabilities beyond the public service to accelerate delivery:

- **Digital service unit** - a public-private initiative that will make a broader range of government services more easily available
- **Smart services working group** - orchestrate future smart service development efforts and coordinate activities among developers and providers.

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93. MAMPU, 2016
94. Pike research. Forecast encompasses markets associated with the investment in and the installation of the technologies that enhance the intelligence and connectedness of the city. Representative technologies include: Smart meters; sensors; fiber networks that support the connection between citizens, governments and utilities; data analytics software for city services; myriad and other hardware and software components that provide the basis of smart cities and communities.
1. Registering to vote or updating details on electoral roll
2. Voting in parliamentary elections
3. Applying for or renewing a concession card
4. Applying for or renewing a passport
5. Applying for or renewing a planning or building permit
6. Applying for or renewing visa, residency, work permit
7. Applying for or renewing an identity or proof of age card
8. Applying for or renewing or replacing a driver’s license
9. Applying for or renewing permits for hunting, fishing etc.
10. Filing tax assessments or submissions
11. Making payments for taxes, rates, fines or penalties
12. Making payments to retirement or government schemes
13. Searching, registering or accessing healthcare records
14. Searching, registering for or accessing healthcare services
15. Searching, registering for or using an employment service
16. Searching, registering certificate of birth, death, marriage
17. Searching, registering or updating a vehicle registration
18. Searching, registering or updating company details
19. Searching, registering or updating property registries
20. Updating address or contact details when moving home
21. Contacting or submitting documents to a court
22. Accessing public housing services or subsidies
23. Accessing real-time public information services
24. Accessing, enrolling or interacting with a public school
25. Accessing, enrolling or interacting with a public university
26. Logging or reporting requests for maintenance and issues
27. Accessing passport control and immigration services
28. Smart community applications (combination of 23 and 26)

1. Future concerns defined as areas that score high on importance in compendium of survey results and selected benchmark countries
2. Importance calculated as highest among both, satisfaction and usage calculated as average of two

7.1.1 Digital Service Unit

The Digital Service Unit programme will seek to increase and improve the delivery of digital government services through a public-private partnership.

Malaysia has an opportunity to improve the perception of the quality of government services towards best-in-class benchmarks.

The three initiatives for implementing this programme are to establish a digital service unit, consisting of engineers, user experience/user interface (UX/UI) designers, product managers and others from both public and private organisations, to promote critical initiatives; and to provide this unit with the mandates necessary to meet its goals.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish digital services unit with a mandate to redesign high-usage digital services in agile time-boxed sprints</td>
<td>MAMPU, Digital Government Technical Working Group95</td>
</tr>
<tr>
<td>- Agree on unit governance model and role</td>
<td></td>
</tr>
<tr>
<td>- Secure sponsorship from private sector technology leaders</td>
<td></td>
</tr>
<tr>
<td>- Establish partnerships to attract talent for secondment</td>
<td></td>
</tr>
<tr>
<td>Prioritise agenda for digital service unit starting with most used services</td>
<td></td>
</tr>
<tr>
<td>- Renew visa, residency, work permit</td>
<td></td>
</tr>
<tr>
<td>- Search, register or access healthcare records &amp; healthcare services</td>
<td></td>
</tr>
<tr>
<td>- Access real-time public information services</td>
<td></td>
</tr>
<tr>
<td>- Access, enrol or interact with a public school</td>
<td></td>
</tr>
<tr>
<td>- Smart community applications (combination of public information services and reporting requests for maintenance or issues)</td>
<td></td>
</tr>
<tr>
<td>Enhance government services in an agile time-boxed manner</td>
<td></td>
</tr>
<tr>
<td>- Set up lean squads for targeted interventions</td>
<td></td>
</tr>
<tr>
<td>- Develop Minimum Viable Products (MVPs) and refine in compressed timelines</td>
<td></td>
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</tbody>
</table>

Supporting this programme will require attracting, hiring and retaining the right human capital, cross-agency coordination, and strong public communications. In particular, we need qualified developers and programmers, UX/UI designers, engineers, project management experts, and data scientists. Coordination with other government agencies and ministries that have a focused intervention perimeter, will help the digital services unit intervene where necessary. A public campaign will also encourage use of e-services across government ministries and agencies.

7.1.2 Smart Services Working Group

The Smart services working group's objective is to orchestrate all future smart service development efforts across agencies.

Multiple national agencies are undertaking smart services efforts in Malaysia, including KKMM, MCMC, MDEC, MOSTI, MAMPU and MIGHT. Coordination of cross-agency efforts towards inter-operability will foster industry development and provide economies of scale.

The activities to achieve this objective include establishing a smart services working group to develop a unified blueprint and standards for future initiatives, and coordinating efforts among stakeholders to enable replication and allow services to be expanded to serve larger groups.

95. This being said, efforts to build these capabilities are now underway among various government agencies.
Figure 54  SMART-CITY APPLICATIONS CAN HELP COPE WITH SCALABILITY OF SMART CITIES

- **Energy**
  - Smart meters and demand response
  - Electric vehicle infrastructure
  - Distributed generation integration
  - Consumption visualisation and behavior change
  - Renewable and co-generation

- **Transport**
  - Intelligent transportation and smart parking
  - Tolling and congestion charging
  - Public transport system information sharing
  - Car and public transport sharing
  - Low emission vehicles and new public transport

- **Water and waste**
  - Smart water meters
  - Distribution network control, leak detection, GIS
  - Storm and flood management
  - Consumption visualisation and behavior change
  - New water purification methods

- **Social**
  - E-government
  - Remote social infrastructure (health, education)
  - Safety and security
  - Social city apps
  - Peer-to-peer room sharing portals

- **Buildings**
  - Home, building and energy management systems
  - Home entertainment and communication
  - Smart consumer appliances and devices
  - Green hospitals
  - Energy-efficient building design and refurbishment

**Note:** GIS = Geographic information system

**Source:** World Economic Forum, BCG, 2015
This structure will ease the definition and execution of Proofs of Concept, which can then be scaled once tested and proven successful. Critical to secure the success of this programme are collaborative efforts among members of the working group and local administration officials to ensure adherence to standards and the smooth replication of projects.

### 7.2 BUILD TARGETED AND PERSONALISED COMMUNICATIONS

Governments have great influence in shaping public perception through a strong communication strategy. As noted earlier, Malaysia’s Rukun Negara communicated effectively as a national platform after the racial riots of the 1960s, building both social cohesion and a sense of national unity.

The decline in Malaysia’s trust levels cited in Chapter 2 creates an urgent need for government communications to play a central role in rebuilding the Rakyat’s trust in institutions.

Furthermore, government communications will need to adapt to shifting consumption preferences from traditional to online media. Malaysian media consumption shifted by 8 percentage points to online sources as the preferred channel from 2008 to 2011, with further movement expected towards online media. Recognising this shift, a number of initiatives to engage public through online channels and social media are underway. Targeted and personalised communications have a role in rebuilding trust through two programmes:

- **High-resolution communications** - through which the government clearly understands citizens’ expectations, and tailors communication efforts to citizens’ media consumption preferences
- **Government communications advisory service** - within the Ministry that would advise other ministries in their communication of government programmes

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96. Part of the ITU-T Study Group 5, the Focus Group on Smart Sustainable Cities has published technical resources on a variety of topics such as “Cybersecurity, data protection and cyber resilience”
97. Such as the ITU-T Study Group 20 - IOT and Applications, Smart Cities
98. Based on the Edelman Trust Barometer, 2016
99. As detailed in Figure 21
100. Examples include Digital Mailbox by POS Malaysia, engagement of stakeholders via social media by BERNAMA and digital initiatives by MOTAC such as MyMOTAC, Travel Malaysia - Smart +, Malaysia Trip Planner, DekatMe, Online Finding Aid and Laman Web Pameran Maya Sirih Pinang : Simbol Warisan Melayu (Sirih Pinang) to name a few
Government communications must play a central role in strengthening the trust levels of the Rakyat towards government institutions.

7.2.1  High-resolution Communications

The High-resolution Communications programme seeks to further strengthen the government’s efforts towards people-centric communication, by clearly understanding the Rakyat’s expectations and concerns, and delivering targeted and personalised communications.

The initiatives are to implement mechanisms to clearly understand citizen expectations, and match communication efforts to citizens’ media consumption preferences.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define citizens’ expectations based on demographics, centres of interest</td>
<td></td>
</tr>
<tr>
<td>- Initiate an extensive consultation exercise to capture citizens’</td>
<td>KKMM</td>
</tr>
<tr>
<td>communication preferences and expectations</td>
<td></td>
</tr>
<tr>
<td>- Strengthen comprehensive understanding of citizens’ expectations and</td>
<td></td>
</tr>
<tr>
<td>preferences through comprehensive analysis</td>
<td></td>
</tr>
<tr>
<td>Understand media consumption preferences and adapt government</td>
<td></td>
</tr>
<tr>
<td>communication channels to the expectations of different groups of the</td>
<td></td>
</tr>
<tr>
<td>Rakyat</td>
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</table>

Steps to implement this programme include enhancing internal team skills in managing the technical aspects of analytical and communication tools.

7.2.2  Government Communications Advisory

The Government Communications Advisory programme’s objective is to improve the effectiveness of the communications.

Collaboration between government agencies to harmonise messaging will strengthen the Rakyat’s trust of the government.

The initiatives recommended to reach this objective are to establish government communication advisory services, and to offer these services to other federal government ministries in support of their communication needs.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refine scope of advisory services for communication unit in other ministries</td>
<td></td>
</tr>
<tr>
<td>- Real-time sensing</td>
<td>KKMM</td>
</tr>
<tr>
<td>- Citizens’ topic mapping</td>
<td></td>
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<tr>
<td>- Engagement best practices</td>
<td></td>
</tr>
<tr>
<td>- Calendar coordination</td>
<td></td>
</tr>
<tr>
<td>Prioritise list of federal ministries that need to be engaged based on</td>
<td></td>
</tr>
<tr>
<td>topics</td>
<td></td>
</tr>
<tr>
<td>Craft central messages to be disseminated</td>
<td></td>
</tr>
</tbody>
</table>
Improving the efficiency of citizen communications

The government of Barcelona’s vision was to improve the efficiency of citizen services and build a personalised relationship with its citizens. The city authorities needed a platform that could not only manage traditional, reactive, call-centre interactions with citizens, but would also include tools to communicate with citizens proactively. To assist, the Citizen Care Department deployed a system to record and process interactions between citizens and government.

The system uses social media to identify segments and analyse them for common characteristics or experiences. This data informs a proactive and personalised approach, through direct and indirect communications. The system also uses diverse communication platforms, such as mobile applications, email, web, and social networks, to complement offline activities.

Successful implementation of this platform has delivered an advanced, interactive, and live communication model that allows the city to capture and act on citizen opinions in a much more agile way, than the traditional census-based mechanism.

“The gains and rewards of economic prosperity must be shared. They must be enjoyed by all. We sought to ensure inclusivity, and invest in our people and skills to allow as many as possible to contribute and benefit from a rising economy.”

YAB Dato’ Sri Mohd Najib Bin Tun Haji Abdul Razak
Launch of the International Organisation of Securities Commissions (IOSCO) Asia-Pacific Hub
Bukit Kiara, Kuala Lumpur
14 March 2017
CHAPTER 8

ACCELERATING INNOVATION
The fourth **strategic imperative** is Accelerating Innovation. Three **policy thrusts** will build Malaysia’s abilities to lead value extraction from innovation across the different stages in the technology lifecycle:

- Accelerate adoption of digital enablers
- Spur innovation ecosystem
- Adopt an agile policymaking approach

### 8.1 ACCELERATE ADOPTION OF DIGITAL ENABLERS

Different policy positions are called for at different stages of a technology’s lifecycle to create the greatest possible economic value. In their first or nascent phase, technologies show signs of early promise, but are yet to be proven. Recognising those weak signals and focusing efforts on encouraging nascent technologies can create new competitive opportunities.

In the second stage, where technology use has started to take off, policy actions typically focus on encouraging experimentation with different applications and easing use by early adopters. At the third phase, or maturity, technologies are typically well established and the policy focus shifts to inclusive development, by boosting adoption among segments that lack resources or capabilities. In the fourth phase, saturation, thoughts turn to the next disruption that will repeat the cycle, and the policy role shifts to focus on rigorous review of regulations and policies to protect from abuse and manage the technology’s eventual decline.

Expanding and accelerating the use of existing innovative technology is the first priority for Malaysia to extract value from innovation.

- **Technology scale-up** - to foster inclusive development and to help laggard segments increase their use of technology
- **Online Presence Expansion** - support actions targeted at overcoming barriers to digital use, and offering the best possible incentives to facilitate the adoption of digitalisation technologies
8.1.1 Technology Scale-up

The technology scale-up programme’s objectives are to foster inclusive development by making sure organisations with limited access to technology resources (typically SMEs) increase their technology use; and, in exceptional circumstances, to promote widespread use of priority technologies across the board where adoption is lagging across sectors in Malaysia.

In 2015, Malaysia’s labor productivity stood at USD26,761\textsuperscript{101}, compared to advanced economies such as the United States, where labour productivity stood at USD70,598\textsuperscript{102}. Increasing labor productivity is essential to Malaysia’s aspiration to be a high-income nation by 2020. Technology is a powerful way to increase productivity. Germany, for example, expects to increase manufacturing productivity by 5-8 percent\textsuperscript{103} through the deployment of Industry 4.0 technologies.

Malaysian SMEs can be a primary beneficiary given the lower productivity starting point. Their technology expenditure lags developed countries, such as Sweden, by 17 percentage points\textsuperscript{104}. Greater technology intensity among SMEs has produced higher revenue, job growth, and greater global outreach. SME technology leaders in developing markets outgrew the technology laggards by 15 percentage points between 2010 and 2012\textsuperscript{105}.

Actions to promote use of technology among businesses have been outlined in the National eCommerce Strategic Roadmap, and include a focus on accelerating seller adoption of e-commerce and increasing use of eProcurement by businesses\textsuperscript{106}. To maximise value for Malaysia, the three recommended initiatives are firstly, to provide targeted support to encourage the use of information and communications technology, and to bridge the technology adoption gap; secondly, to shift investments and co-investments as the primary model of financial support; and thirdly, to generate and promote success stories to advance the use of technology.

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\textsuperscript{101} Malaysia Productivity Corporation (MPC)
\textsuperscript{102} The Conference Board – Total Economy Database
\textsuperscript{103} Industry 4.0: The Future of Productivity and Growth in Manufacturing Industries, BCG, 2015
\textsuperscript{105} BCG, 2013
\textsuperscript{106} National eCommerce Strategic Roadmap, MDEC, 2016
Figure 56  IMPACT OF TECHNOLOGY USE ON GROWTH AND REACH AT SMEs

Source: Economic impact study, Quantitative survey, BCG, 2013
Focus support initiatives on top three technology enabler areas
- Promote use of proactive customer interfaces
  - Marketing tools including Search Engine marketing
- Promote use of reactive customer interfaces
  - Customer service
  - Online product catalogues
- Educate on use of procurement supply chain tools for
  - Digital order placement
  - Finding suppliers
  - Price comparison

Continue shift in funding support to co-funding and conditional investment models to maximise efficiency
- Co-funding: Joint funding with fund recipient
- Conditional: Fund award tied to completion of specific actions

Build Malaysian success stories to create awareness of value and advocate technology use through online or offline SME community

To ensure the success of this programme it is critical to ensure that technology adoption is well marketed to SMEs, especially in high-value industries. It is also important to emphasise education and upskilling of fund recipients, to ensure that benefits derived are maximised and sustainable.

8.1.2 Online Presence Expansion

Proactive and reactive customer interface tools are among the most highly utilised digital technologies by developed market SMEs. Both types of customer interfaces require organisations to have an online presence.

Promoting online presence among SMEs and easing barriers to online adoption will drive the digitalisation agenda.

Create targeted awareness campaigns to SMEs that focus on proof of value of online presence
SME Corp, MDEC

Create end-to-end packaged offerings incorporating different elements to ease online adoption, including elements such as domain names, security, hosting and monitoring tools
MYNIC

As technologies reach maturity, they begin the natural progression towards obsolescence. New technologies with better price and performance characteristics emerge, and users begin to migrate away from the status quo. It is typical for some segments to be left behind, and these cases present an opportunity to leapfrog to next-generation technologies. These days, for many people, their first introduction to ICT and digital technologies is through tablet or smart phones, rather than personal computers. This leapfrogging, and not gradual progression, is the objective for all users who have missed a full technology cycle.
Figure 57  MOST USED TECHNOLOGIES AMONG HIGHLY DIGITISED SMEs IN SWEDEN

Most used technologies in developed country benchmarks

Source: SME Survey 2013, BCG
8.2 SPUR INNOVATION ECOSYSTEM

Three programmes have been identified to develop Malaysia’s technology sensing capabilities and to encourage a culture of experimentation amongst Malaysian companies and citizens:

- **Future Sensing Squad** - to anticipate the effects of emerging technologies on the C&M sector, to prioritise technologies, and to coordinate development efforts
- **Technology experimentation** - make targeted development efforts to encourage demand for experimentation and reduce supply-side barriers for high-value technologies and sectors
- **Establishment of Digital Hubs** - to nurture and grow digital entrepreneurs and start-ups

8.2.1 Future Sensing Squad

The Future Sensing Squad will seek to anticipate impacts from emerging C&M technologies and coordinate responses early in the technology lifecycle, enabling Malaysia to stay ahead of the technology curve.

Technology sensing is critical for identifying, managing and finding opportunity within disruptions. Other nations have long recognised this, and have acted to sense, assess and act on emerging trends. The United States first recognised the potential of artificial intelligence in the 1950s, and began to fund research programmes. It has continued these funding efforts over the years, and released a report outlining the latest national roadmap in October 2016, titled ‘Preparing for the Future of Artificial Intelligence’.

Sensing efforts within the C&M sector are currently performed at the agency level and tied to agency objectives. MDEC, for example, sensed the potential of big data and analytics and has invested in development efforts since 2010. Coordinating sensing efforts on C&M across the Ministry and broader government stakeholders offers the potential to accelerate development efforts.

The recommendations are to establish a squad to anticipate opportunities and threats to the C&M sector from emerging technologies, and to prioritise technologies, coordinate, and hand over development efforts when appropriate.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
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<tbody>
<tr>
<td>Establish ‘Future C&amp;M Squad’ with three cross-functional teams</td>
<td>KKMM, MOSTI &amp; MIGHT</td>
</tr>
<tr>
<td>- Sensing team: Identify emerging trends in coordination with existing government efforts (MDEC, MIGHT, MOSTI, others) and other institutions (academic research, think tanks, experts)</td>
<td></td>
</tr>
<tr>
<td>- Industry engagement team: Partner with industry representatives and technology leaders to ascertain development needs</td>
<td></td>
</tr>
<tr>
<td>- Government engagement team: Stakeholder engagement and hand over to agencies for development</td>
<td></td>
</tr>
<tr>
<td>Set up sprint(^{107}) cadence with industry and government stakeholders, such as discovery sprints and advocacy sprints to industry</td>
<td></td>
</tr>
<tr>
<td>Define priorities and sign Memoranda of Understanding with agencies or ministries to hand over development efforts</td>
<td></td>
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</table>

High-quality, skilled human capital will be required to provide sensing inputs, anticipate impacts, and set policies. Additionally, an elevated level of sponsorship can support advocacy of emerging technologies, ensure cooperation amongst the different government agencies, and to complete hand over of development efforts.

8.2.2 Technology Experimentation

The technology experimentation programme will encourage a culture of innovation in the application of emerging technologies, with the ultimate goal of accelerating future adoption and early value.

The programme needs to focus development efforts on high-value technologies (e.g. Blockchain, Industry 4.0 and Artificial Intelligence) and demand from high-impact sectors, and undertake targeted development efforts linked to infrastructure or talent that reduce supply-side barriers.

\(^{107}\) Sprint in the agile methodology are units of time dedicated (usually few weeks) to address a specific set of tasks. In this case a task can focus on a new technology to sense or advocate.
### Organise series of hackathons to build industry understanding of technologies beyond narrow verticals with a focus on a wider range of business use cases. Candidate areas include Blockchain, which has three focus areas:
- Creation of killer applications beyond Fintech, such as asset sharing and secured storage
- Authentication and trust origination at the edge, such as ID codifications and certifications
- Core protocol improvement, such as the implementation of smart contracts and new consensus methods for lower latency

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<td>MDEC</td>
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<tr>
<td>- Authentication and trust origination at the edge, such as ID codifications and certifications</td>
<td></td>
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<tr>
<td>- Core protocol improvement, such as the implementation of smart contracts and new consensus methods for lower latency</td>
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</tr>
<tr>
<td><strong>Set up Centre of Excellence capability to encourage technology experimentation in areas at early stages of accelerating adoption. Candidate areas include Industry 4.0:</strong></td>
<td>MITI with support from MDEC, MOSTI, MIGHT, KKMM</td>
</tr>
<tr>
<td>- Build a Public Private Partnership (PPP) blueprint including industry participants (such as E&amp;E, chemicals) and government stakeholders (such as MITI, MOSTI) to agree on the Centre of Excellence design and operating model</td>
<td></td>
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<tr>
<td>- Build and operate the COE gradually with core participation to finalise the proof of value</td>
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<tr>
<td>- Expand access to a wider range of businesses and disseminate learned best practices through visits, tradeshows, publications and more</td>
<td></td>
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<tr>
<td><strong>Set up technology sandbox to enable low-cost prototyping of next generation business technologies and provide infrastructure support for learning. Candidate areas include (weak) Artificial Intelligence:</strong></td>
<td>MDEC, MIMOS with support from MOSTI, MIGHT</td>
</tr>
<tr>
<td>- Gradually expand ADAX coverage to more advanced analytics techniques and applications at the core of Artificial Intelligence (such as deep learning, Natural Language processing, affective computing)</td>
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<tr>
<td>- Create parallel study groups to address legal and ethical considerations of the AI-related technologies used</td>
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</table>

Essential to the success of this programme are partnerships with private sector businesses that have a critical role in an industry ecosystem (such as GLCs, and global companies with strong links to Malaysian SME ecosystem) to spread adoption through their supply chain.

### 8.2.3 Establishment of Digital Hubs

Digital Technology Hubs aim to nurture and grow innovative and disruptive digital entrepreneurs and start-ups to create cutting-edge technologies, products and business models. These hubs within a campus environment, are specially designed to offer a symbiotic ecosystem of resources, inspiration and collaboration opportunities to grow the positive impact of the Digital Economy. For example, hubs can offer an ecosystem with attractive lifestyle and amenities, incubators and accelerators, access to venture capitalists, and talent and skills development opportunities.

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<tr>
<th>INITIATIVES</th>
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<tbody>
<tr>
<td><strong>Facilitate foreign direct investment and domestic direct investment in attracting key digital companies and entrepreneurs to fuse international experience with ideas and content</strong></td>
<td>MDEC</td>
</tr>
<tr>
<td><strong>Develop export-oriented digital solutions and services using the advantages and niche areas that cities provide</strong></td>
<td>MDEC</td>
</tr>
</tbody>
</table>

Expanding coverage of digital hubs and launchpads beyond Kuala Lumpur and into other high-impact economic areas will accelerate the adoption trend. Supplementing these established centres by attracting entrepreneurial international talent will also help the local ecosystem grow.
8.3  ADOPT AN AGILE POLICYMAKING APPROACH

Agile policymaking promotes the dissemination and adoption of emerging technologies by unlocking regulatory barriers and creating a high-visibility culture of proactive policy setting. The programme identified to achieve these goals is:

- **Policy advocacy squad** - in cooperation with the ‘Future C&M Squad’ examine the policy implications of emerging C&M technologies.

8.3.1 Policy Advocacy Squad

The Policy advocacy squad's objective is to move Malaysia one step ahead as the dissemination of innovative technologies depends heavily on a facilitative policy environment and the removal of regulatory barriers. As technology becomes increasingly pervasive, implementation and public policy challenges frequently cut across jurisdictions and require co-regulation and co-creation of policy.

The emergence of ride-sharing applications such as Uber and Grab, for example, have extended the reach of digital technology to transportation and raised regulatory questions that cut across transportation and the C&M sector. A proactive approach to policy setting is necessary to harness technological change as it accelerates. Responding to technological change requires a structure to examine the implications of emerging technologies and facilitate co-regulation and policy co-creation.

To adopt an agile approach to policymaking, the recommendations are to: establish a squad to examine the policy implications of emerging C&M technologies on prioritised sectors; and, to partner with ministries to advocate policies that facilitate dissemination of innovative technologies and enable co-regulation.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
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<tbody>
<tr>
<td><strong>Establish squad as a cross-functional working team within ministry, with a mandate for cross-sector policy coordination related to C&amp;M technology impacts</strong></td>
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<tr>
<td><strong>Prioritise sector and technology focus areas requiring immediate policy and regulatory adaptation; initial focus could include:</strong></td>
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<tr>
<td>- Conditions of validity for fully digital Know-Your-Customer with the to-be-established digital identity (banking)</td>
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<tr>
<td>- Regulation for electronic storage and sharing of medical records (health)</td>
<td></td>
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<tr>
<td>- Ethical and legal implications of autonomous algorithms, such as that applied to autonomous cars</td>
<td></td>
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<tr>
<td>- Peer-to-peer transactions beyond financial service companies, based on Blockchain</td>
<td></td>
</tr>
<tr>
<td><strong>Create cross-ministry working groups for prioritised topics to facilitate co-regulation and policy co-creation</strong></td>
<td></td>
</tr>
<tr>
<td>- Create Terms of Reference for squad, set meeting cadence and target KPIs</td>
<td></td>
</tr>
<tr>
<td>- Partner with other regulators/ministries and advocate for changes in policies and regulations</td>
<td></td>
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KKMM, with support from other ministries
The fifth strategic imperative is Catalysing Creativity. Two policy thrusts have been identified to inspire the Malaysian creative content sector:

- Revitalise local content production and distribution
- Enhance Malaysian content beyond borders

**9.1 REVITALISE LOCAL CONTENT PRODUCTION AND DISTRIBUTION**

Given Malaysia’s racial and religious diversity, a strong national identity is critical to strengthen and maintain social cohesiveness. The importance of national identity has been re-emphasised across leaderships, and recent campaigns such as 1Malaysia reinforce the continued relevance of the national identity agenda.

A vibrant Malaysian creative content sector has the potential to strengthen the national identity in two ways:

- Valuing Malaysian heritage and making it relevant in the digital world
- Inspiring Malaysians through authentic local content

This calls for a revitalised approach towards content development efforts in Malaysia. Five programmes to nurture a local creative content ecosystem have been identified as follows:

- **Heritage digitisation** - digitise and selectively re-package heritage-based information for specific audiences, and create virtual tours for physical heritage sites
- **Content Malaysia umbrella** - re-activate the Content Malaysia Pitching Centre, and develop the Centre as a single coordination point for the development of all local creative content
- **Level playing field** - create an equal playing field, harmonising existing variations in censorship procedures amongst local content broadcasters
- **Repositioning national broadcaster** - reposition national broadcaster towards content that fosters national identity
- **Strengthening national news** - diversify distribution formats and channels for the national news to strengthen its position

**9.1.1 Heritage Digitisation**

The heritage digitisation programme’s objective is to digitise and disseminate Malaysian heritage to make it relevant in the digital world.

The digital content sector, defined as animation, applications and games, has performed well, recording 4% growth from 2014 and reaching revenues of RM7.4 billion in 2015\(^{109}\). In contrast, the Malaysian film industry has recorded consecutive-year losses from 2012 to 2015 despite government funding, recording a 110% loss margin in 2015.

\(^{109}\) MDEC, Press Reports 2016
To achieve this objective, recommended actions will target information-based heritage and physical-asset heritage. Information-based heritage will be digitised and selectively re-packaged to reach specific target audiences, such as schools. Physical-asset heritage can be enhanced by the creation of virtual reality tours in an online environment.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
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<tbody>
<tr>
<td>Digitise and disseminate archived Malaysian content</td>
<td>FINAS, with support from MOTAC</td>
</tr>
<tr>
<td>- Build business case, secure budget and identify talent within the National Film Development Corporation Malaysia (FINAS) to support digitisation and marketing</td>
<td></td>
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<tr>
<td>- Run consultation with experts to prioritise archive content for digitisation</td>
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<tr>
<td>- Digitise content and re-package for contemporary audience and media formats</td>
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<tr>
<td>Develop Virtual Reality (VR) tours</td>
<td>MDEC</td>
</tr>
<tr>
<td>- Secure budget and prioritise heritage sites</td>
<td></td>
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<tr>
<td>- Source VR production and distribute content</td>
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This programme’s enabling strategies for success include creating adequate infrastructure for the digitisation of historical films and content, and securing a virtual reality production partner to manage end-to-end processes, from filming to video stitching and editing.

### 9.1.2 Content Malaysia Umbrella

The Content Malaysia Umbrella will strengthen the Content Malaysia Pitching Centre’s role as the single coordination point for the development of all local creative content.

Current development efforts for the film industry can benefit from a coordinated single umbrella approach and from re-focusing development efforts towards sustainable, high-multiplier actions. The recommended actions are to; consolidate the disbursement of all content creation funds through a single channel; to design and track funding performance indicators; and to provide end-to-end development support to the content creation industry.

<table>
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<tr>
<th>INITIATIVES</th>
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<tbody>
<tr>
<td>Revitalise pitching centre starting from industry development funding alignment</td>
<td>KKMM in coordination with MDEC, FINAS, RTM, MOTAC</td>
</tr>
<tr>
<td>- Identify all funds focused on local content creation and include relevant fund in centre’s mandate</td>
<td></td>
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<tr>
<td>- Develop and publish disbursement process, governance and KPIs for stage gated funding mechanism</td>
<td></td>
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<tr>
<td>- Publish annual report on fund disbursements and impact measurements</td>
<td></td>
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<tr>
<td>Build on the pitching centre to create a content Malaysia umbrella that acts as a coordination body for all types of development actions</td>
<td>FINAS, MDEC, IPPTAR</td>
</tr>
<tr>
<td>- Commercialisation support, covering both export and for adjacent opportunities such as merchandising</td>
<td></td>
</tr>
<tr>
<td>- Industry talent development efforts equally incorporating academic curricula and providing practical exposure to industry professionals</td>
<td></td>
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<tr>
<td>- Infrastructure support (pre/post production)</td>
<td></td>
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<tr>
<td>Create an online database of content development grants across agencies as a coordination mechanism and to minimise funding overlap</td>
<td>MDEC, FINAS</td>
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</table>
The Content Malaysia Umbrella programme relies on seamless coordination between the multiple government bodies supporting creative content production, while recognising the existing initiatives with good records of accomplishment in developing specific sub-sectors of the industry, such as animation. While coordination remains essential, effective programmes with proven ability to create new creative content champion should continue, and leverage the online database mentioned above to minimise overlaps.

9.1.3 Level Playing Field

The level playing field programme’s objective is to amend censorship procedures to bridge regulation gaps between local content broadcasters.

Censorship procedures are applied unequally across broadcasters, with the self-censorship model applied only to some broadcasters.

The recommendation is to harmonise censorship guidelines across local broadcasters by extending the Pratonton process and providing the option for in-house censorship to all broadcasters.

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<tr>
<th>INITIATIVES</th>
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<tbody>
<tr>
<td>Standardise censorship guidelines and procedures across all local broadcasters</td>
<td>LPF</td>
</tr>
<tr>
<td>- Extend the Pratonton process</td>
<td></td>
</tr>
<tr>
<td>- Provide option for in-house censorship</td>
<td></td>
</tr>
<tr>
<td>Work with regional and global OTT content providers to encourage measures that ensure adequate consumer protection within Malaysia social and legal blueprints</td>
<td>KKMM</td>
</tr>
</tbody>
</table>

9.1.4 Repositioning National Broadcaster

As a platform with wide reach, Malaysia’s national broadcaster plays a key role in building national identity by showcasing noteworthy local content and creating public understanding.

The recommendations are to; reposition the national broadcaster towards local content that builds national identity; and focus on analytic journalism to increase public awareness but also public understanding of critical topics.

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<tr>
<th>INITIATIVES</th>
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<tbody>
<tr>
<td>Strengthen local content beyond license conditions with goal of strengthening Malaysia brand and promoting national unity</td>
<td>RTM with support of KKMM</td>
</tr>
<tr>
<td>Position RTM as a preferred channel for insight on current national issues by increasing its focus on analytic journalism and insightful content</td>
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</tr>
<tr>
<td>Monitor capacity of institution to self-fund under the new paradigm and review implications on funding blueprint</td>
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9.1.5 Strengthening National News

Consumption behaviours for news are moving to online channels and bite-sized formats. Two actions are recommended to strengthen the national news agency Bernama. First, to diversify distribution formats and channels; and second, to monitor capacity for self-reliance and adjust long-term funding and the ownership structure accordingly.
The objective of the Malaysian content overseas programme is to use creative content as a platform to export Malaysian culture and build a stronger national brand overseas.

9.2 ENHANCE MALAYSIAN CONTENT BEYOND BORDERS

Although Malaysia has creative talent that is recognised globally, few Malaysian films have received international fame or are well known outside of Malaysia. The opportunity exists to systematically increase overseas exposure and build a stronger national brand.

- **Malaysian content overseas** - to increase exports of Malaysia-made creative content overseas, conduct systematic planning for outreach, and make use of innovative distribution channels such as leveraging Malaysian institutional presence abroad

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<tr>
<th>INITIATIVES</th>
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<tbody>
<tr>
<td><strong>Focus BERNAMA’s efforts on news but diversify distribution formats and channels</strong>&lt;br&gt;- Actively invest in the new media content to follow media consumption trends&lt;br&gt;- Strengthen capabilities in infographics and video content production as pervasive format for new media</td>
<td>BERNAMA with support of KKMM</td>
</tr>
<tr>
<td><strong>Monitor self-funding capacity of BERNAMA and adjust long-term funding and ownership structure accordingly</strong></td>
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</table>

### 9.2.1 Malaysian Content Overseas

The objective of the Malaysian content overseas programme is to use creative content as a platform to export Malaysian culture and build a stronger national brand overseas.

An opportunity exists to raise the profile of Malaysian content overseas, including film and digital content (animation, games, new media platforms) to gain international visibility.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
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<tbody>
<tr>
<td><strong>Systematically increase participation in international and regional events</strong>&lt;br&gt;- Build cross-agency committee to govern single point of presence for Malaysia at international events for all types of content (animation, film and others)&lt;br&gt;- Prioritise events (such as the Oscars and Cannes) and promote participation among producers&lt;br&gt;- Expand reach of Malaysian content events to global audiences (both geographically and by content types covered)</td>
<td>FINAS (film), MDEC (digital content)</td>
</tr>
<tr>
<td><strong>Take advantage of Malaysian institutional presence in ASEAN by applying suitable mechanisms to incentivise local players to support the marketing and distribution of Malaysian content</strong></td>
<td></td>
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<tr>
<td><strong>Accelerate the execution of international co-production treaties with priority to countries such as Australia</strong></td>
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</table>
Augmented Reality (AR) and Virtual Reality (VR) are both evolutions of audio-visual technologies.

Augmented Reality technology layers computer-generated enhancements on top of an existing reality to make it more meaningful through the ability to interact with it. AR can be developed into applications and used on mobile devices to blend digital components into the real world in such a way that they enhance one another. Popular examples include Google Glass and Pokémon Go.

Virtual Reality is an artificially generated simulation or recreation of a real-life environment or situation. VR solutions provide immersive user experiences, primarily by stimulating vision and hearing through devices such as wearable headsets like Facebook’s Oculus.

Both technologies are finding increasingly applications in disseminating and extending the reach of national information-based heritage and physical heritage sites.

The Royal Ontario Museum applies Augmented Reality technologies to bring exhibits to life and engage visitors by infusing displays with interactivity

- Selected exhibits allow Augmented Reality enhanced experiences
- At the exhibit ‘The Ultimate Dinosaurs: Giants From Gondwana’, AR layers virtual experiences over the real environment to bring dinosaurs to life.

The UK uses Virtual Reality technologies to extend the reach of its physical heritage sites

- VR tours of popular tourist destinations, including Stonehenge, provide immersive experiences
- Interactive maps and virtual tours of famous building and monuments, such as Houses of Lords & Commons, allow access anywhere, anytime
“There must be a steady stream of high quality content, which will feed the appetite of the 600 million consumers in ASEAN. And with the reach of social media, quality content will go beyond our ASEAN borders to reach the world and the billions of people.”

YB Datuk Seri Dr. Salleh Said Keruak
AIFFA 2017 Biz World at The Pullman Hotel, Kuching
5 May 2017
CHAPTER 10

EMPOWERING TALENT
The sixth **strategic imperative** is Empowering Talent. Empowered digital talent is the foundation of Malaysia’s high-income, inclusive, and sustainable development aspirations. Three **policy thrusts** have been identified for this aspiration:

- Embed ‘digital literacy by default’
- Reskill and upskill talents
- Develop leading digital expertise

### 10.1 EMBED ‘DIGITAL LITERACY BY DEFAULT’

Malaysia has long recognised the importance of digital literacy, and has embarked on several talent development initiatives related to information and communication technologies. These include 1BestariNet, which provides internet access and virtual learning platforms at all schools, and the #mydigitalmaker Movement, which seeks to integrate computational thinking into national primary and secondary curriculum and grow industry-academia collaboration to nurture future digital innovators. Digital connectivity and literacy efforts such as Connecting the Unconnected have looked to bridge the digital divide and ensure inclusive, sustainable development.

Despite these actions, the digital divide in Malaysia is real. In 2015, 71.1%\(^{110}\) of Malaysians used the internet despite approximately 86% of populated areas having internet access\(^{111}\). A breakdown of internet use reveals a digital divide; 75% of higher-income Malaysians reported using the internet, while only 44% of lower income respondents reported using the internet\(^{112}\). The divide is similarly evident across education and age dimensions.

- **Early digital literacy** - by introducing computational thinking early in schools through a digital technology curriculum
- **Bridging the Digital Divide** - provide enablement training to underpenetrated demographic groups using the most resource-efficient channels

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110. International Telecommunications Union, 2016  
111. 3G coverage used as proxy, MCMC  
112. Pew Center, 2015
**Figure 58 THE IMPACT OF TECHNOLOGY ADVANCEMENTS ON JOBS**

Technology advancement will drive potential for automation...  

...with implications on jobs – removed, changed, created

<table>
<thead>
<tr>
<th><strong>Automated</strong></th>
<th><strong>Augmented</strong></th>
<th><strong>Additional</strong></th>
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</thead>
<tbody>
<tr>
<td>Jobs that predominantly involve routine activities are at the highest risk of being completely automated.</td>
<td>Jobs with both routine and non-routine tasks will be augmented - automating routine tasks while allowing the worker to focus on the non-routine.</td>
<td>Brand new job categories will emerge over the coming decades as technology change introduces new needs.</td>
</tr>
<tr>
<td>Remaining non-routine activities only relevant as complementary to routine activities will not be required post-automation.</td>
<td>This change will see improved productivity of human capital – leading to increased output or reduced demand for labour.</td>
<td>New job roles will require new abilities and qualifications with a focus on technical abilities and soft skills.</td>
</tr>
</tbody>
</table>

### Advanced computing

- **Activities potentially automated**
  - e.g. Accounting Clerks and Bookkeepers: Processing Information
  - AI-like algorithms perform complex tasks, adapt to new situations and improve over time.

### Autonomous systems

- **Activities potentially automated**
  - e.g. Bus and Rail Drivers: Operating Vehicles
  - Intelligent, autonomous control system that operates without human assistance.

### Smart production

- **Activities potentially automated**
  - e.g. Factory Process Workers: Handling and Moving Objects
  - Flexible, touch enabled robots, software configurable and able to interact with humans.
Figure 59  COMPUTATIONAL THINKING CURRICULUM IN THE UK

STAGE 1
(5-6 years old)
- Children will learn what algorithms are, not necessarily involving computers
  - For example, explained as ‘a set of instructions’ teachers may illustrate the idea using recipes, or by breaking down the steps of children’s morning routines
- Create /debug simple programme of their own, to develop logical reasoning skills
- Take first steps to use devices to ‘create, organise, store, manipulate, and retrieve digital content’

STAGE 2
(7-11 years old)
- Create and debug more complicated programs with specific goals
- Understand concepts including variables and “sequence, selection, and repetition in programs”
- Continue to develop logical reasoning skills
- Learn to responsibly use websites and other internet services
- Use devices for collecting, analysing and presenting back data and information

STAGE 3
(12-14 years old)
- Use two or more programming languages to create own programs
  - Schools and teachers will be free to choose the specific languages and coding tools
- Learn simple Boolean logic (e.g. the AND, OR and NOT operators)
- Work with binary numbers, and study how computer hardware and software work together

Source: Computing At School, UK, Press reports
10.1.1 Early Digital Literacy

The digital literacy for preschool programme encompasses knowledge, skills, and behaviors involving the effective use of digital devices. Children can acquire basic computational thinking skills from primary school.

Computational thinking has become increasingly important in the era of digitalisation. Starting digital education early will help bridge future talent supply gaps.

The recommended action is to begin teaching computational thinking at the primary school level, through the introduction and delivery of a digital technology curriculum.

This programme benefits from the full support of other government agencies, including MDEC, to align existing efforts towards building digital literacy.

10.1.2 Bridging the Digital Divide

Bridging the digital divide will generate economic and social value by enabling digital migrants to make the best use of new information technology, and strengthen Malaysia’s efforts towards becoming an inclusive society.

The actions recommended to bridge the digital divide are to: target enablement programmes to underpenetrated segments, such as rural communities, low-income workers, and women; to find and use the highest-multiplier actions to deliver these programmes; and to use existing dissemination channels and mechanisms to ensure wide coverage.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinate with all stakeholders to sign off on target and content guiding principles</td>
<td>MOE</td>
</tr>
<tr>
<td>Design digital technology curriculum for all levels</td>
<td>MOE</td>
</tr>
<tr>
<td>Train master trainers at all levels</td>
<td>MOE</td>
</tr>
<tr>
<td>Pilot new curriculum in selected schools and expand to all levels</td>
<td>MOE</td>
</tr>
</tbody>
</table>

Facilitate partnerships to secure support of bodies that can influence trusted social resources towards advocacy of digital literacy (school teachers, local government officials, religious leaders, village heads, health officers, social leaders and others) | KKMM |

Execute programmes to build digital literacy targeting rural*, low-income households and women | KKMM |

Use existing disseminations channels and mechanism to ensure wide coverage of literacy programmes | KKMM |

Design a step-up digital technology curriculum towards full enablement
- Understand – focus on basic digital literacy such as computer use, internet use, and basic utilities such as email
- Consume – Use of relevant online services such as e-government, e-learning and e-banking
- Create value – Provide tools to participate in value-creating activities such as e-commerce | MCMC, MDEC |

Strategies to enable this programme include strengthening internal capabilities to develop and execute training programmes that are targeted at underpenetrated segments. Improving the ability to work with and manage volunteer networks, community digital advocacy representatives, and industry partners to execute these training programmes will be vital to this initiative’s success.
10.2 RESKILL AND UPSKILL TALENTS

Current workforce development schemes can be improved by including digital skills and extending industry participation in development efforts. Two programmes have been identified to retrain existing and future workforce to remain relevant in the increasingly digital economy.

- **Human capital development fund** - to sharpen their focus on relevant and updated ICT topics
- **Continuous learning** - increase completion of technology-related Massive Open Online Courses (MOOC), as a way to keep the workforce current on digital developments

### 10.2.1 Human Capital Development Fund

This programme’s objective is to equip the Malaysian workforce with updated technological skills so that it can embrace and exploit advancements and disruption.

PSMB has been supporting trainings related to ICT and technology by providing financial assistance to its eligible registered employers. During the Implementation Council Meeting (ICM) in 2016 some portion of 30% PSMB Pool Fund has been allocated to offer ICT Adoption and Big Data courses to Malaysian employees and future workers. The allocation has been utilised to run programmes in relation to the country’s ICT industry.

### Discussion Box: Create new digital income opportunities

Malaysia is committed to driving the inclusive adoption of digital solutions. The aim is to mobilise a future generation that is equipped with the relevant skills to thrive in a digital economy and that is excited to be an active participant in its growth.

In 2015 the government via MDEC launched two key national programmes to help Malaysians earn additional income through digital means:

I. **eRezeki** – This programme offers digital income opportunities to individuals, with specific focus to assist individuals from Bottom 40% of household income category. As the programme is based on crowdsourcing concept and models, focus and effort are put in to develop the crowdsourcing ecosystem in Malaysia. MDEC will continuously engage with local and global crowdsourcing platform providers to offer Malaysia’s crowd-labour pool and talent, and to form strategic collaborations and partnerships.

II. **eUsahawan** – This programme aims to instil and empower Malaysian youth and micro-entrepreneurs with digital entrepreneurship knowledge to grow and propel their businesses further via online platforms, in line with Malaysia's digital economy agenda.

Source: MDEC
Under the Industry Based Certification Programme (INBASE) programme, PSMB has launched the National Empowerment in Certification and Training for Next Generation Workforce (NECT-Gen) initiative, to upskill and certify the current and next generation of workforce through high valued technology certification training programmes.

PSMB has also established the Graduates ENhancEment pRogrAmme for Employability (GENERAtE) as part of the initiative to improve the condition of currently unemployed graduates in the country. Under the GENERAtE programme, approximately RM1.4 million of financial assistance was approved for the year 2016 and 2017 (as at 17 February 2017).

Two actions are recommended to achieve the programme’s objectives. First, human capital development funds, such as under PSMB, should be expanded to sharpen their focus on relevant and updated topics in information and communications technology. Second, actions to encourage adoption of such programmes are needed.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design training curriculum to bridge gaps in increasing and revising skills, with focus on intermediate technology topics such as basic analytics and introductory programming</td>
<td>PSMB, MDEC</td>
</tr>
<tr>
<td>Establish mechanism to track effectiveness of training schemes and incorporate feedback</td>
<td></td>
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<tr>
<td>Create awareness and encourage adoption of programmes</td>
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</table>

10.2.2 Continuous Learning

With constant digital advances, keeping the workforce current on latest developments requires continuous learning.

New online delivery mechanisms such as MOOCs promise convenience, cost effectiveness, and a wide reach. Recognising the potential of MOOCs, Malaysia has undertaken efforts to promote use of MOOCs for learning; currently 20 public universities in Malaysia offer 219 courses relevant to local needs through the OpenLearning (OL) platform.

113. Ministry of Higher Education
Technology has always been a part of the educational experience, from the abacus for counting to the pen and pencil, the calculator, and the PC. Today many schools use notebooks and iPads in pedagogy. Despite the new technologies, today's classrooms look little different from those of 30 years ago. Several forces are coming together to create conditions for a fundamental transformation of the ways in which teachers teach and students learn. Low-cost internet access is one powerful force. The prevalence of low-cost internet access and internet-enabled mobile devices allows high-quality teachers and content to reach enormous audiences, without requiring physical presence in a classroom. MOOCs make use of these developments to provide primarily online education. These institutions, in collaboration with a number of universities, offer a range of high-quality, online courses at scale.

The success of MOOCs can be best expressed in user numbers, with Coursera and edX attaining 4 and 1 million users respectively, slightly more than one year after launch.\(^{114}\)

Source: Class Central, New York Times, Education Dive

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\(^{114}\) Coursera and edX, 2015
Recommendations for this programme are two-fold: first, to partner with MOOC providers to identify a list of recommended MOOCs; and second, to promote identified courses to increase completion rates.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finalise partnerships with Massive Open Online Course (MOOC) providers such as Coursera</td>
<td>PSMB, MOHE, MDEC</td>
</tr>
<tr>
<td>Determine list of recommended MOOCs relevant for Malaysian industry segments, such as GLCs</td>
<td></td>
</tr>
<tr>
<td>Create awareness of mechanism and value of courses to boost enrolment and completion rates in courses</td>
<td></td>
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</tbody>
</table>

One strategy to implement this programme is to conduct communication campaigns to build awareness within the public and private sectors about shortlisted MOOC courses, with the goal of encouraging enrolment and completion of courses.

10.3 DEVELOP LEADING DIGITAL EXPERTISE

Supply of quality ICT graduates is limited. Projections show that the ICT talent supply gap is expected to widen by 2025\(^{116}\). Beyond that, employers report that ICT skill sets do not correspond to the industry's needs, and they express dissatisfaction with the quality of ICT skills among local graduates\(^ {117}\). One programme has been identified to encourage an innovation culture among Malaysian talent and help Malaysia become a thought leader in selected C&M topics with greater competitive strength.

- **Leading digital expertise** - develop a national workforce plan, undertake targeted actions to bridge demand-supply gaps in the C&M sector, and strengthen quality of university graduates

10.3.1 Leading Digital Expertise

The objectives of the leading digital expertise programme are to produce high-standard, industry-ready ICT graduates and bridge the demand-supply gap in ICT graduates.

The actions recommended to achieve these objectives are to define the national ICT workforce priorities; co-develop an action plan with MOHR to increase participation in ICT-related courses; and strengthen the quality of ICT graduates from public universities.

<table>
<thead>
<tr>
<th>INITIATIVES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase awareness and uptake of ICT-related careers</td>
<td>MDEC with support from National Human Capital Council, MOE and MOHE</td>
</tr>
<tr>
<td>- Drive national workforce planning for ICT sector</td>
<td></td>
</tr>
<tr>
<td>- Monitor demand growth in ICT-related fields and coordinate with university on capacity planning</td>
<td></td>
</tr>
<tr>
<td>- Facilitate regular information sessions on ICT-related careers with selected principals and teachers</td>
<td></td>
</tr>
<tr>
<td>Strengthen quality of ICT graduates</td>
<td>MDEC</td>
</tr>
<tr>
<td>- Identify, promote and enhance premier digital tech universities to supply competent and relevant talents to the ICT industry</td>
<td>MDEC with support from MOHE</td>
</tr>
<tr>
<td>- Redesign university curriculum based on workforce planning input to meet future industry demands</td>
<td>MDEC with support from MOHE</td>
</tr>
<tr>
<td>- Design mandatory industry immersion programme as graduation prerequisite to increase employability of ICT students(^ {118})</td>
<td>MDEC with support from JPK</td>
</tr>
<tr>
<td>- Agree on design of curriculum through collaboration with MOHR and Majlis Dekan ICT (MADICT)</td>
<td>MDEC, MOHE with support from JPK</td>
</tr>
<tr>
<td>Promote recognition of TVET qualification to industry and among potential students</td>
<td>MADI CT, MOHE(^ {119}) with MDEC as Industry Partner</td>
</tr>
<tr>
<td>- Ensure continued relevance of curricula through industry-academia collaboration</td>
<td>MDEC, MOHE with support from JPK</td>
</tr>
<tr>
<td>- Promote awareness of qualification to potential employers and raise profile through industry events</td>
<td>MDEC, MOHE</td>
</tr>
<tr>
<td>- Establish an independent governance body to enhance the value of the profession and raise the professional standards of ICT curricula and ICT professionals in Malaysia</td>
<td></td>
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</tbody>
</table>

\(^{115}\) Once viability of MOOCs are determined and when implementation is being considered, further engagement with industry will be done in stages through Sectorial Training Committee (STC)  
\(^{116}\) Analysis of data from the MSC Malaysia Talent Supply-Demand Study 2010-2013, 2014-2017  
\(^{117}\) National Employment Returns, 2011  
\(^{118}\) For example in France, where industry immersion is mandatory to complete certain courses  
\(^{119}\) Majlis Dekan ICT
Figure 60  DEMAND AND SUPPLY OF ICT TALENT IN MALAYSIA

1. Supply and demand includes the demand of both IT and Creative Multimedia graduates

Note: IT includes computer science, software engineering, Information Technology, Information System, networking, security, mobile, Artificial Intelligence, technology management; Creative Multimedia Content includes animation, games design, graphics design, multimedia, visual effects, virtual reality and media technology. Forecast for demand and supply between 2017 and 2025 estimated assuming linear growth trend, assuming CAGR 2014-2017 applies consistently: IT Demand 10%, CMC Demand 11%, IT Supply 8%, CMC Supply 2%
Source: MSC Malaysia Talent Supply-Demand Study 2010-2013, 2014-2017,

Strategies for this programme will include regular meetings with universities and industry members to update and customise the university curriculum to meet industry needs, and far-reaching communication campaigns to build awareness of ICT-related courses and careers among top students.
“The most important thing is to make the technology inclusive - make the world change. Next, pay attention to those people who are 30 years old, because those are the internet generation. They will change the world; they are the builders of the world.”

Jack Ma
Launch of Digital Free Trade Zone
22 March 2017
Balkanised ecosystems
Peer-to-peer by default
Eternal platforms
Two-speed world
CHAPTER 11

FUTURE SCENARIO
11.1 FUTURE-PROOFING THE MALAYSIA C&M BLUEPRINT

In today’s globalised, connected world, uncertainty continues to increase, driven by rapid technology advances and a socio-economic landscape in continuous tension. This uncertainty is especially prevalent in the C&M sector.

The consistent and constant innovations observed in the C&M sector specifically drive higher volatility, reduce predictability, and compress timeframes. For instance, from 2009 to 2015, the rapid rise of Over-The-Top (OTT) applications has transformed the telecommunications market landscape. The market capitalisation of the top 10 OTT providers grew two-and-half times, while the market capitalisation of the top 10 telecommunication companies remained almost flat\(^{120}\). This rapid change has seen value migrate to content, and has challenged traditional telecommunication business models. Further disruptions to the sector and other industry verticals will become the norm.

With such uncertainty, conventional forecasting methods that extrapolate historical tends to the future are no longer sufficient.

11.2 INTRODUCE SCENARIO ANALYSIS

Scenario analysis complements forecast-based analysis to help us prepare for a set of uncertain futures. Scenarios are exploratory narratives that outline a range of possibilities and provide opportunities to envisage alternate future states of business, industry, and society. Unlike forecasting, which assumes one ‘right’ answer, scenarios need only to be plausible to be useful. Developing scenarios improves government’s and industry’s preparedness by providing opportunities to identify the best sets of actions to prosper under each future, and by helping to identify early warning signals for each future.

The strategic imperatives, policy thrusts and programmes have all been stress-tested against scenarios built using the scenario analysis method described in this chapter to make the Blueprint resilient to future shifts.

Major uncertainties that have the potential to shape the future are formulated to illustrate this philosophy and related approaches. Four scenarios for 2025 are constructed based on those uncertainties. The section concludes with a set of recommended actions to prepare for the best possible national outcomes in each scenario.

11.3 UNCERTAINTIES DRIVING THE FUTURE

Multiple trends have the potential to create disruptions between now and 2025. Mapping trends by uncertainty and their potential for disruption reveals the ones that may shape the future in a significant way.

Six Grey Swan\(^ {121}\) trends selected have the potential to dramatically change the shape of future. The Grey Swans can be reflected along two broad dimensions. The first dimension is the social, political and economical dimension; the second is the technology dimension. The evolution path of each trend is highly uncertain, and a range of possible outcomes for each presents different futures.

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120. BCG Analysis of data from IQ Capital. Examples of OTT companies include Google, Amazon, Facebook, Ebay, Yahoo, Baidu, Tencent, Priceline.

121. Highly uncertain events whose outcomes have the potential to significantly shift the future.
Figure 61 TRENDS THAT CAN DRIVE THE FUTURE

<table>
<thead>
<tr>
<th>Degree of Uncertainty</th>
<th>Question marks</th>
<th>Grey Swans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Wearables</td>
<td>Global/regional integration</td>
</tr>
<tr>
<td></td>
<td>Smart homes/workspaces</td>
<td>Societal divisiveness</td>
</tr>
<tr>
<td></td>
<td>Participative democracy</td>
<td>Wealth inequality</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of Uncertainty</th>
<th>Today's stars</th>
<th>Hot spots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Smart cities</td>
<td>Sharing economy</td>
</tr>
<tr>
<td></td>
<td>Rise of mass affluent class</td>
<td>Internet of things</td>
</tr>
<tr>
<td></td>
<td>4th Industrial Revolution</td>
<td>Autonomous vehicles</td>
</tr>
<tr>
<td></td>
<td>Urbanisation</td>
<td>Virtual citizenship</td>
</tr>
<tr>
<td></td>
<td>Big Data Analytics</td>
<td>Cloud computing</td>
</tr>
<tr>
<td></td>
<td>Consumer fragmentation</td>
<td>Cloud computing</td>
</tr>
</tbody>
</table>

Source: BCG
### Figure 62 RANGE OF UNCERTAIN FUTURE OUTCOMES FOR THE GREY SWANS

<table>
<thead>
<tr>
<th>Grey Swans</th>
<th>Evolution Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global / Regional Integration</strong></td>
<td>Brexit as the new norm, politics primarily inward looking</td>
</tr>
<tr>
<td><strong>Societal Divisiveness</strong></td>
<td>ASEAN united, regional integration well established</td>
</tr>
<tr>
<td><strong>Economic Inequality</strong></td>
<td>Pan-regional harmonisation, politics is outward looking</td>
</tr>
<tr>
<td><strong>General Artificial Intelligence</strong></td>
<td>Applied AI is all pervading and augments everyday experiences</td>
</tr>
<tr>
<td><strong>Peer-to-Peer Protocols</strong></td>
<td>General artificial intelligence manifests</td>
</tr>
<tr>
<td><strong>Hyperscale Network Resilience</strong></td>
<td>On-demand basic cloud computing is pervasive</td>
</tr>
<tr>
<td></td>
<td>Selective, siloed platforms</td>
</tr>
<tr>
<td></td>
<td>Internet plugged off by default, with unconnected digital islands</td>
</tr>
<tr>
<td></td>
<td>Hyper scale centralised platforms are the norm</td>
</tr>
<tr>
<td></td>
<td>Few digital islands, with a large fully connected network ecosystem</td>
</tr>
<tr>
<td></td>
<td>Third wave of disruption, peer-to-peer models at scale</td>
</tr>
<tr>
<td></td>
<td>Seamless connectivity, enabled by unlimited ubiquitous bandwidth</td>
</tr>
</tbody>
</table>

Source: BCG
Figure 63  FOUR SCENARIOS IN 2025

Two-speed World

Social, economic and digital divide
- Technology advances immensely; 100+ year lifespans common, machines take care of most work, but benefits accrue only to rich
- Rich minority in power, trust deficit leads to regular social disturbances

Peer-to-peer by Default

Decentralised self organising, borderless world
- Decentralised self-organising communities drive politics; government is transparent and fully participative
- General artificial intelligence widely substitutes workers; 25 hour work weeks are the norm

Balkanised Ecosystems

Dis-integration as the new normal
- International conflicts common; national security dominates headlines
- Online trust is broken due to incessant cyberthreats; internet switched off by default for most

Eternal Platforms

Socio-economic models centred on hyperscale platforms
- Hyperscale platforms (e.g. for government services, trade, finance), stretch governance, regulation and policy far beyond borders
- Rich, fulfilled lives for all; consumption-driven growth in a developed economy

Source: BCG
11.4 THE WORLD IN 2025: FOUR EXTREME SCENARIOS AND POLICY PREPAREDNESS FOR THE FUTURE

Framing the future along the two dimensions offers four divergent scenarios for Malaysia in 2025. Each scenario represents a possible future and a world in which technology and social, political and economic development have evolved in different ways.

Across the different futures, policy responses need to keep human values at centre stage. Systematic monitoring of leading indicators serves as an early warning mechanism to identify inflection points towards the emergence of each scenario. Early identification will provide enough time to mobilise resources and trigger the situational policy responses appropriate for each scenario.

Each scenario requires a different set of policy responses to address the unique challenges it presents. For example, if the world is moving towards the scenario ‘Peer-to-peer by default’, one example of a policy shift might be to migrate the digital identity platform to a decentralised open ledger to allow wider usage in peer-to-peer transactions. Therefore, we need to prepare a set of specific responses to address the various scenarios presented by these potential futures, choosing the areas where Malaysia should shape and accelerate the shift, and those where it is more efficient to adapt.

The following sections outline a specific set of priorities called for under each scenario to guide future decision-making.

11.4.1 Peer-to-peer by Default

In this scenario, a large urban population and a smaller rural population have equally enjoyed the benefits of development. The benefits of technology are significant and well-distributed, to allow prosperous, sustainable, and inclusive life for all. Significant technology advances have raised the quality of life for all, and lifespans of 100 years and more are common. Machines have broadly replaced human workers, and 25-hour work weeks are the norm. The economic adjustments from displacement have been smooth, and the surplus is equitably distributed. Peer-to-peer technologies are the new standard, and have transformed politics and society.

The C&M sector has benefitted from technology disruptions. Connectivity is ubiquitous and pervasive. General-purpose machine intelligence has transformed economic activities, and machines have displaced humans from most traditional occupations. Pervasive peer-to-peer interaction has decentralised information and communication. Decentralised self-organising online communities shape consensus on governance and policy. Online first communication is standard, with hyper-transparent and real-time government communications adopted by all.

The greatest challenges under this scenario come from the rise of peer-to-peer technology and other advances that displace humans in economic activity.

The main situational priorities in such a scenario would be:

- **Cultivate a forward focus to keep pace with innovation.** Malaysia will need to; first, sense and experiment to stay ahead of the innovation curve; and second, empower the Rakyat to benefit from disruptive technology at an even faster pace, likely calling for over-investment in the field

- **Strengthen trust to maintain social cohesion.** Malaysia will need to strengthen its trust advantage through a user-controlled digital identity and increased data transparency and open access, and must build capacity for constant two-way conversations as the default way of government engagement
11.4.2 Two-speed World

In this scenario, the benefits of technology are significant but have accrued disproportionately to the richer and more educated populations. Significant technology advances have raised quality of life for the rich, and lifespans of 100 years and more can be bought. Machines have broadly replaced lower-skilled human workers, and large employment losses have left a significant segment of the population underdeveloped. A small group of ‘haves’ around the globe govern a very large population of ‘have-nots’. The economic and digital divides lead to regular social disturbances.

While the C&M sector has benefitted from technological progress, skewed socio-economic development has distributed those benefits unequally. Connectivity is ubiquitous and pervasive, but the rich have preferential and better-quality access. General-purpose machine intelligence disrupts economic activity, and the large-scale displacement of lower skilled human occupations has produced significant unemployment and a widening economic divide. Online-first communication is the norm. Given the large social and economic divide, government communications focus on preserving social stability and building social cohesion.

Rising social and economic divisions drive this scenario’s major challenges. Technology advances accrue disproportionately to the rich. Large economic displacements from technology advances might lead to a significant number of Malaysians left behind economically.

The situational priorities would then likely include:

- **Build inclusiveness to bridge social and economic divides.** Efforts will need to refocus on supporting left-behind segments for inclusive growth and ensuring equal access to opportunity, especially for what would then be a rural low income minority

- **Restore broken trust in a divisive system** by strengthening trust in both the government and the digital world

11.4.3 Eternal Platforms

In this scenario, countries operate in a regionally integrated context. ASEAN has grown into an Asian union, and the European Union has expanded to cover the entire continent. Regional cooperation has advanced on both economic and social fronts. A large urban population and a smaller rural population have enjoyed the benefits of development equally.

Technology advances, although significant, are not transformative, but raise quality of life for all. Government services are delivered digitally throughout the region; taxes, land registries, and corporate registries are all regional.

Innovation in the C&M sector has slowed, and the focus has shifted to expanding and adapting existing technologies, and making incremental improvements. Connectivity is ubiquitous and pervasive. Specific Artificial Intelligence augments human work, boosting economic activity and improving overall productivity; power skeletons assist construction workers, and driverless Artificial Intelligence helps transportation. Hyper-transparent and real-time government communications are adopted by all. Regional harmonisation shapes and drives regulation and other government policies.

Hyperscale platforms that cut across national boundaries are the norm in this scenario, creating the need for cross-border regulation and policymaking. Regional and global partners influence each other’s policy and regulation, and some partners’ priorities might clash with domestic Malaysian interests.

The rise of platforms strengthens the potential for abuse of power by platform providers, and requires constant action to protect the Rakyat. The situational priorities would include:

- **Lead with policy to secure Malaysian interests** by sensing trends, anticipating impacts and developing a vision for favourable direction early, then proactively engage regional and global bodies in order to defend the Malaysian agenda

- **Protect the Rakyat from abuse** by securing platforms critical to national interest, such as identity, cyber security, and act against the potential abuse of power by platform providers
Figure 64  ILLUSTRATION OF SITUATIONAL PRIORITIES UNDER EACH SCENARIO
11.4.4 Balkanised Ecosystems

In this scenario, we are in a politically fragmented world after economic and political unions around the world break down, one after the other. Regional unions have disintegrated, and global trade agreements have broken down. Falling global trade and unstable international politics dominate the headlines. The external environment is reminiscent of a cold war. Prices of all imports, especially technology products, have increased significantly. Once-common items, such as smartphones, become harder to access in some countries. Pervasive cyberthreats cripple communications infrastructure. The age of connectivity is past, with only selected government services available online.

The C&M sector is hard hit due to an unfavourable economic environment and uncontained cyberthreats. Connectivity is restricted to secured government networks. With restricted online connectivity, significant offline and broadcast communications are the order of the day. Government communications focus on maintaining national identity and social stability. Cyber-attacks challenge business and citizens; C&M businesses are hit, overall productivity falls. Malaysia keeps a larger share of economic benefits locally, with restricted international trade, but growth prospects are limited because of reduced access to other markets and suppliers.

A hostile external environment and constant cyberthreats challenge Malaysia under this scenario. Rising cyberthreats raise the possibility of switching off large sections of the internet. Information and communication-enabled productivity would fall across the economy. The situational priorities would be mostly defensive.

- **Secure digital infrastructure** essential to the national interest such as telco infrastructure, government installations, and utilities, by mandating and executing required cyber defense protocols

- **Minimise economic damage** by developing a differentiated value proposition in the C&M sector to trade on equal terms with partners, and cultivating self-reliance in C&M areas critical to national interest, such as cyber security

11.5 CULTIVATING ADAPTIVE ADVANTAGE

Addressing the uncertain future explored in the four scenarios imposes an inherent requirement to be flexible, and adapt to the future as it emerges. Cultivating adaptive advantage will allow Malaysia to do so, and enable optimal national outcomes in uncertain circumstances.

Cultivating this adaptive advantage requires adherence to three principles:

- **Signal advantage**. Malaysia will need to detect, capture, and exploit information patterns. Capabilities to sense emerging trends, read signals of change, and use real-time data to shape actions are essential

- **Parallel structure**. An uncertain environment offers no clear answers. Discovering solutions and paths to success requires experimentation. Running the planning clock faster, cultivating a culture of experimentation, and adopting a portfolio mind-set foster the experimentation advantage

- **Organisation advantage**. An outside-in focus and embedding agile practices will enable adaptive organisations in the public and private sectors

The three principles above have been embedded in programmes outlined in the previous sections, such as the creation of Future Sensing Squad, the Industry 4.0 Centre of Excellence under the Technology experimentation programme, or encouraging co-regulation as part of the thrust Adopt an agile policymaking approach.
Figure 65  PRINCIPLES TO CULTIVATE ADAPTIVE ADVANTAGE

1. **Signal advantage**
   - Detect, capture, and exploit information patterns
     - Sense emerging trends
     - Read change signals
     - Use real-time data to shape actions

2. **Experimentation advantage**
   - Foster experimentation
     - Run the planning clock faster
     - Manage economics of experimentation
     - Adopt portfolio mindset

3. **Organisation advantage**
   - Adaptive government organisations
     - Encourage transparency and outside-in focus
     - Grow towards an agile organisation
“In this era of digital, competition between all is intensifying. To hold the future is not about who you win against but who you will unite with. It is easy to forget that all of us are working to serve one main goal that is digital transformation for a digital economy. To reach our goal we sometimes need to look beyond ourselves to help contribute to the success of others”

YAB Dato' Seri Dr. Ahmad Zahid Hamidi
Asia Pacific Innovation Day 2017
9 November 2017
CHAPTER 12

MOVING FORWARD
The success of the Malaysia C&M Blueprint depends on a strong and robust governance structure that outlines clear roles and responsibilities, and involves the participation and mobilisation of all major stakeholders. The Blueprint’s governance will seek to coordinate delivery efforts and address implementation concerns from all ministries and agencies involved.

The six strategic imperatives identified in this Blueprint and their corresponding programmes collectively address wide-ranging topics, from bridging the digital divide between communities to shaping an information society through the cultivation of digital talent. Achieving the goals of this Blueprint will require the collective efforts and commitment of government, industry, and communities for successful delivery of its programmes.

The establishment of a robust governance structure serves the important purpose of ensuring that delivery efforts under the Blueprint are on time and of high quality. The Advisory Board, working groups and the delivery unit each play important roles in the successful implementation of the Blueprint. The governance also ensures that clear mechanisms are in place to identify and resolve critical issues at different levels.

12.1 COMMUNICATIONS & MULTIMEDIA ADVISORY BOARD

In this regard, the Communications & Multimedia Advisory Board will be formed to provide overall guidance and leadership for the delivery of the Blueprint.

The advisory board will include representation from senior leadership members from appropriate Ministry of Communications & Multimedia divisions, departments and agencies. Senior-level officers from other federal ministries will also attend advisory board meetings by invitation. Beyond the Government, the involvement of leading private sector players in the advisory board will bring a focus on industry needs and serve as a means for the advisory board to be updated on latest industry developments.
The advisory board will convene twice a year to discuss current and emerging issues, set the overall direction for the sector, and address major arbitrages and implementation hurdles escalated to the advisory board for guidance. The advisory board, through the Minister of Communications & Multimedia, will also report on overall progress of the Blueprint to the Cabinet of Malaysia.

12.2 STRATEGIC IMPERATIVE WORKING GROUPS

Working groups will be established for each strategic imperative at the implementation level to direct the delivery efforts of programmes under their purview. These working groups will guide programme execution by resolving technical implementation challenges, and ensuring progress in their respective imperatives.

Working group members will meet as needed, and will be expected to report frequently on their progress towards implementation to the Delivery Management Unit of the Malaysia C&M Blueprint.

12.3 COMMUNICATIONS & MULTIMEDIA DELIVERY MANAGEMENT UNIT

To ensure the smooth implementation of the Malaysia C&M Blueprint, a Delivery Management Unit (DMU) will be established. The DMU will be responsible for steering the implementation efforts of the Blueprint by effectively coordinating, reporting and addressing delivery challenges.

The DMU will also coordinate the interaction and facilitate the effective flow of information among the Communications & Multimedia Advisory Board and the six strategic imperative working groups. Regular communication and interaction with the working groups and other major implementation stakeholders will be vital to resolve all obstacles to smooth implementation of programmes.

As the secretariat to the Communications & Multimedia Advisory Board, the DMU will also consolidate and synthesise information provided by the six strategic imperative working groups during advisory board meetings, and report on the progress of the Blueprint to members of the public.

The outcome of this Blueprint will determine the future of Malaysia for the next ten years and beyond. Close collaboration among the major stakeholders is necessary to deliver the Blueprint. Delivered successfully, this Blueprint will position Malaysia at the forefront of the C&M sector regionally and globally.
# GLOSSARY

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>AI</td>
<td>Artificial Intelligence</td>
</tr>
<tr>
<td>APAC</td>
<td>Asia Pacific</td>
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<tr>
<td>API</td>
<td>Application Programming Interfaces</td>
</tr>
<tr>
<td>AR</td>
<td>Augmented Reality</td>
</tr>
<tr>
<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
</tr>
<tr>
<td>BCG</td>
<td>The Boston Consulting Group</td>
</tr>
<tr>
<td>BNM</td>
<td>Bank Negara Malaysia</td>
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<tr>
<td>C&amp;M</td>
<td>Communications and Multimedia</td>
</tr>
<tr>
<td>CAGR</td>
<td>Compound Annual Growth Rate</td>
</tr>
<tr>
<td>CSM</td>
<td>CyberSecurity Malaysia</td>
</tr>
<tr>
<td>DMU</td>
<td>Delivery Management Unit</td>
</tr>
<tr>
<td>DOS</td>
<td>Department of Statistics Malaysia</td>
</tr>
<tr>
<td>DTT</td>
<td>Digital Terrestrial Television</td>
</tr>
<tr>
<td>EUR</td>
<td>Euro</td>
</tr>
<tr>
<td>FINAS</td>
<td>National Film Development Corporation Malaysia</td>
</tr>
<tr>
<td>FTA</td>
<td>Free-to-air</td>
</tr>
<tr>
<td>GB</td>
<td>Gigabyte</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GNI</td>
<td>Gross National Income</td>
</tr>
<tr>
<td>IC</td>
<td>Identification Card</td>
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<tr>
<td>ICT</td>
<td>Information and Communications Technology</td>
</tr>
<tr>
<td>ID</td>
<td>Identity Document</td>
</tr>
<tr>
<td>INBASE</td>
<td>Industry Based Certification Programme</td>
</tr>
<tr>
<td>INTAN</td>
<td>Institut Tadbiran Awam Negara / National Institute of Public Administration</td>
</tr>
<tr>
<td>IoT</td>
<td>Internet of Things</td>
</tr>
<tr>
<td>IP</td>
<td>Internet Protocol</td>
</tr>
<tr>
<td>IPTV</td>
<td>Internet Protocol Television</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>ITU</td>
<td>International Telecommunications Union</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>JAPEN</td>
<td>Jabatan Penerangan / Department of Information</td>
</tr>
<tr>
<td>JASA</td>
<td>Jabatan Hal Ehwal Khas / Department of Special Affairs</td>
</tr>
<tr>
<td>JPA</td>
<td>Jabatan Perkhidmatan Awam / Public Service Department</td>
</tr>
<tr>
<td>JPBD</td>
<td>Jabatan Perancangan Bandar dan Desa / Federal Department Of Town And Country Planning Peninsular Malaysia</td>
</tr>
<tr>
<td>JPDP</td>
<td>Jabatan Perlindungan Data Peribadi / Department of Personal Data Protection</td>
</tr>
<tr>
<td>JPK</td>
<td>Jabatan Pembangunan Kemahiran</td>
</tr>
<tr>
<td>JPN</td>
<td>Jabatan Pendaftaran Negara / National Registration Department</td>
</tr>
<tr>
<td>KKMM</td>
<td>Ministry of Communications and Multimedia Malaysia</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
</tr>
<tr>
<td>KPKT</td>
<td>Kementerian Perumahan Kerajaan Tempatan / Ministry of Urban Wellbeing, Housing and Local Government</td>
</tr>
<tr>
<td>KSN</td>
<td>Ketua Setiausaha Negara / Chief Secretary to the Government</td>
</tr>
<tr>
<td>KSU</td>
<td>Ketua Setiausaha / Secretary General</td>
</tr>
<tr>
<td>LPF</td>
<td>Lembaga Penapisan Filem / Film Censorship Board</td>
</tr>
<tr>
<td>MAMPU</td>
<td>Malaysia Administrative Modernisation and Management Planning Unit</td>
</tr>
<tr>
<td>MADICT</td>
<td>Majlis Dekan ICT</td>
</tr>
<tr>
<td>MCMC</td>
<td>Malaysian Communications and Multimedia Commission</td>
</tr>
<tr>
<td>MDEC</td>
<td>Malaysia Digital Economy Corporation</td>
</tr>
<tr>
<td>MHz</td>
<td>Megahertz</td>
</tr>
<tr>
<td>MIGHT</td>
<td>Malaysia Industry-Government Group for High Technology</td>
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<tr>
<td>Acronym</td>
<td>Definition</td>
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<tr>
<td>MITI</td>
<td>Ministry of International Trade and Industry</td>
</tr>
<tr>
<td>MJIPTP</td>
<td>Mesyuarat Jawatankuasa Induk Pemantauan Tanah Persekutuan / Federal Land Monitoring Committee</td>
</tr>
<tr>
<td>MOE</td>
<td>Ministry of Education</td>
</tr>
<tr>
<td>MOF</td>
<td>Ministry of Finance</td>
</tr>
<tr>
<td>MOHA</td>
<td>Ministry of Home Affairs</td>
</tr>
<tr>
<td>MOHR</td>
<td>Ministry of Human Resources</td>
</tr>
<tr>
<td>MOOC</td>
<td>Massive Open Online Courses</td>
</tr>
<tr>
<td>MOSTI</td>
<td>Ministry of Science, Technology and Innovation</td>
</tr>
<tr>
<td>MOTAC</td>
<td>Ministry of Tourism and Culture Malaysia</td>
</tr>
<tr>
<td>MPC</td>
<td>Malaysia Productivity Corporation</td>
</tr>
<tr>
<td>MPT</td>
<td>Mesyuarat Pengurusan Tertinggi / Senior Management Meeting</td>
</tr>
<tr>
<td>MVP</td>
<td>Minimum Viable Products</td>
</tr>
<tr>
<td>MyCERT</td>
<td>The Malaysia Computer Emergency Response Team</td>
</tr>
<tr>
<td>MyKad</td>
<td>Kad Pengenalan Malaysia / Malaysia Identity Card</td>
</tr>
<tr>
<td>NACSA</td>
<td>National Cyber Security Agency</td>
</tr>
<tr>
<td>NCSP</td>
<td>National Cyber Security Policy</td>
</tr>
<tr>
<td>NDTF</td>
<td>National Digital Taskforce</td>
</tr>
<tr>
<td>OTT</td>
<td>Over-the-top</td>
</tr>
<tr>
<td>PCT</td>
<td>Patent Cooperation Treaty</td>
</tr>
<tr>
<td>PM</td>
<td>Project Managers</td>
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<tr>
<td>PSI</td>
<td>Public Sector Information</td>
</tr>
<tr>
<td>Q1</td>
<td>Quarter 1</td>
</tr>
<tr>
<td>QoS</td>
<td>Quality of Service</td>
</tr>
<tr>
<td>RM</td>
<td>Ringgit Malaysia</td>
</tr>
<tr>
<td>RMK-11</td>
<td>Rancangan Malaysia Kesebelas / Eleventh Malaysia Plan</td>
</tr>
<tr>
<td>RTM</td>
<td>Radio Television Malaysia</td>
</tr>
<tr>
<td>SaaS</td>
<td>Software as a Service</td>
</tr>
<tr>
<td>SDBA</td>
<td>Street Drainage and Building Act 1976</td>
</tr>
<tr>
<td>SEM</td>
<td>Search engine marketing</td>
</tr>
<tr>
<td>SME</td>
<td>Small and medium enterprise</td>
</tr>
<tr>
<td>SME Corp</td>
<td>SME Corporation Malaysia</td>
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<tr>
<td>SPAD</td>
<td>Suruhanjaya Pengangkutan Awam Darat / Land Public Transport Commission</td>
</tr>
<tr>
<td>TCPA</td>
<td>Town Council Planning Act</td>
</tr>
<tr>
<td>Telco’s</td>
<td>Telecommunications Companies</td>
</tr>
<tr>
<td>TV</td>
<td>Television</td>
</tr>
<tr>
<td>UBBBL</td>
<td>Uniform Building By Laws 1984</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organisation</td>
</tr>
<tr>
<td>US$</td>
<td>United States Dollar</td>
</tr>
<tr>
<td>USA / U.S.</td>
<td>United States of America</td>
</tr>
<tr>
<td>USD</td>
<td>Universal Service Provision</td>
</tr>
<tr>
<td>UX/UI</td>
<td>User Experience / User Interface</td>
</tr>
<tr>
<td>VNI</td>
<td>Visual Networking Index</td>
</tr>
<tr>
<td>VOIP</td>
<td>Voice Over Internet Protocol</td>
</tr>
<tr>
<td>VR</td>
<td>Virtual Reality</td>
</tr>
<tr>
<td>Wi-Fi</td>
<td>Wireless Fidelity</td>
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</table>
REFERENCES

In the process of crafting this Blueprint, the Ministry of Communications and Multimedia has worked closely with relevant agencies and other ministries and has referenced the work based on relevant national plans, policy papers, regulations and acts on C&M and adjacent areas in Malaysia. The references reviewed include the following documents:

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- Intellectual Property (IP) Commercialisation Policy
- Science & Technology (S&T) Policy
- Computer Crime Act 1997
- Copyright (Amendment) Act 1997 (Act A994)
- Electronic Government Activities Act 2007
- Malaysian Public Sector Open Source Software (OSS) Master Plan
- National Creative Industry Policy
- National Biometrics Technology Roadmap 2008
- National Wireless Communications Technology Roadmap
- Cyber Space Security Roadmap
- Grid Computing Technology Roadmap