Malaysia: Towards Becoming ASEAN's Digital Capital

Value Creation for ASEAN Digital Growth

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Contents

Foreword

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Digital economy deployment in Malaysia has brought numerous impacts and benefits to the people, industry, and government. In 2020, the contribution of Information and Communication Technology (ICT) sector recorded a value of RM320 billion – with an estimated annual growth rate of 8.5% since 2015. In fact, the digital economy contributed 22.6% to the Malaysia's Gross Domestic Product (GDP) in 2020, rising from 18.1% in 2015.

How 2020 turned out is unprecedented due to COVID-19. While this global disruption has brought many economies to a standstill, governments and businesses are placing digitalisation at the forefront of their efforts to address the challenges. Now we are "digital by default". Instead of asking why, individuals and businesses are asking "how". This resulted in accelerated digitalisation efforts across all segments, a silver lining in this uncertain time.

Objectively, this paper identifies Malaysia's key strengths and opportunities, both internally and around the region. Furthermore, it outlines the building blocks for Malaysia to achieve this vision and the synthesis of numerous plans to elevate Malaysia into becoming a regional powerhouse for the digital economy.

The recently launched national strategic initiative, Malaysia Digital (MD), successor to the MSC Malaysia, will be key to this. It seeks to encourage and attract companies, talents and investment while enabling Malaysian businesses and the Rakyat to play a leading part in the global digital economy.

By pairing up Malaysia's digital-first capabilities and key ASEAN opportunities, this White Paper will showcase Malaysia's strengths to offer unique value propositions to all stakeholders.

The Malaysia Digital Economy Corporation (MDEC) is proud to be working with Huawei to jointly develop this White Paper. With the collaborative efforts to provide and consolidate insights from all parties, this White Paper showcases the hallmarks of Malaysia's digital economy. I firmly believe all readers will derive value from this White Paper as it charts Malaysia's course as Southeast Asia's digital capital.

As a regional powerhouse, and in reinforcing its role as the digital hub of ASEAN, I am very excited that Malaysia will continue to be the launchpad for global champions to land and expand within Malaysia to ASEAN and beyond, establishing the nation as a globally competitive digital nation powered by a progressive, thriving and innovation-led digital economy and ecosystem.

> *"Malaysia will continue to be the launchpad for global champions to land and expand within Malaysia to ASEAN and beyond, establishing the nation as a globally competitive digital nation powered by a progressive, thriving and innovation-led digital economy and ecosystem.*

MICHAEL YUAN

CEO,
Huawei Malaysia

The last couple of years have witnessed the acceleration of the digital economy globally, highlighting the importance of digital transformation with the pressures placed on economies by the COVID-19 pandemic. Now, more so than ever, technology is intertwined with our daily lives through its various forms such as hardware and software, likened to devices and applications, all of which are direct extensions of the physical economy.

With our Asia-Pacific Regional Headquarters, Huawei Global Training Centre and Global Technical and Solutions Centre as well as the Huawei Customer Solution Innovation Center all based in Kuala Lumpur, Huawei firmly believes in and is invested in Malaysia's ability to develop and provide a strong ICT foundation to enable public and private sectors to thrive. Our confidence in Malaysia's capabilities in creating a safe and inclusive environment for businesses is fostered through almost 21 years of close collaboration with the Government of Malaysia, countless local partners, agencies and the industry.

From understanding and taking into consideration the Malaysian Government's strategies and plans, operational issues, pain points and perspectives in going digital, this White Paper explores the different facets of Malaysia's journey to becoming the Regional Digital Capital, emphasising local digital development and its ability to include all stakeholders. This topic is explored with the goal of developing a Malaysia that is digitally capable of meeting the future needs of the country, while also having the ability to better serve the region and beyond.

Huawei is grateful and honoured to have partnered with the Malaysia Digital Economy Corporation (MDEC) to explore the important topic of digital development in Malaysia. I congratulate MDEC and my team in Huawei Malaysia for the effort they have put in to make this White Paper insightful, consolidating and crafting the thoughts and ideas extracted from all involved parties. I hope the White Paper will spur a thought-provoking discussion on the topic of digital development amongst the public and private sectors locally and abroad, and contribute towards overcoming the digital gaps that currently exist in order to position Malaysia as the ASEAN Digital Capital.

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Executive Summary

MALAYSIA: TOWARDS BECOMING ASEAN'S DIGITAL CAPITAL

Value Creation for ASEAN Digital Growth

Centre of Interest

Cross-borders, cross-sectors, cross-businesses ecosystem, partnerships and investments

Centre of Excellence

Fountainhead of digital infrastructure, resources, capabilities and services

Centre of Innovation

Value driven digital business models and products driving growth

Opportunity Prize
(cumulative 2021–2030)

RM1.8 trillion
incremental GDP

1.5 million
incremental jobs

Digital is the New Normal; COVID-19 has accelerated the digital agenda globally

Malaysia has a strong foundation with multiple digital plans

Malaysia needs to accelerate its digital development to remain competitive

The Four Building Blocks

Digital Infrastructure

Ubiquitous, resilient and affordable digital infrastructure as the new engine for growth

Accelerate 5G

Spectrum allocation; FWA technology to accelerate 5G deployment and enable 5G IoT for industries

Localise Cloud and Develop AI Capabilities

- Drive T3, T4 data centres
- Increase hyperscale cloud presence
- Prioritise local players
- Increase international connectivity

High Tech Component Manufacturing

Supplier and exporter of AI chipsets and devices for ASEAN

Inclusive Growth

Expand 4G/broadband coverage to provide access across communities

Fixed Broadband Competitiveness

Affordable and quality connectivity for businesses

Digital Security

Trust and confidence in the ecosystem, enabling complex transactions and innovation by securing the infrastructure

Lead Digital Security Policies

Emerging policies such as data localisation and sovereignty policy and to play a role as a harmonisation agent in ASEAN

Digital Security Innovation Leader

Lead digital security innovation; provision of solutions to create secured Malaysia and CoE for ASEAN

Culture of Security

Inculcate security mindset as a culture for consumers and businesses, especially SMEs

Leverage National Digital ID

Facilitate and enable more complex transactions digitally through National Digital ID

Blockchain Leader

Lead Blockchain technology and innovation advancement for the region

Digital Talent

Diverse future-ready digital talent pool towards a high performing and competitive network of top talent

Identify Talent Shortage

Data analytics for digital talent shortage by skillset and sector

Grow and Retain Local Talent

- Upskill and reskill local talent with digital skills
- Leverage on academia and training programmes
- Retain top talent by creating access to high value opportunities

Digital Thought Leaders

Promote Digital Thought Leaders to drive knowledge network and sharing

Fill gaps with Global Talent, where required

Global Talent for specific skills and knowledge; contribute knowledge infusion for locals

Network of ASEAN Talent Capital

Platform to maximise talent productivity, performance and sustainability, with continuous network and sharing

Digital Ecosystem

An integrated and future-ready digital ecosystem driving value creation and attract global players.

Productivity Value

Local Value Chain Digitalisation

Drive efficiencies through digitalisation of businesses, government and supply chains; fostering **local champions**

Innovation Value

Local Innovation Cultivation

Strengthen linkages and collaborations for innovation and develop local **unicorns**

Trade Value

Digital Trading and Marketplace

Broaden and deepen integration into global value chains and trading of higher value digital assets and services

Conducive Investment Environment

FDIs from global players and MNCs, **DDIs** from local players as well as startup funding

Integrated Partnerships

Partnerships between public and private sector, strengthening policy framework to provide clear policy direction for investment

To drive the Digital Economy

Increased digital activities and transactions, for enhanced wealth creation, productivity and quality of life to achieve an economy that is:

- Truly digital, with adoption by citizens and businesses, as well as SME digitalisation
- Ever evolving, through innovation across the industry verticals and emerging technologies
- With leading positions in ASEAN through its competitive advantages
- Impact of the digital economy and spillovers

*References are included in the respective chapters to contextualise Malaysia's strengths and provide a view of potential use cases and approaches

LEVERAGES

Malaysia's Digital Strengths

- Digital Positioning
- Plans and Policies
- Digital Landscape

DIFFERENTIATORS

- Create Industry Internet Platform
- Cultivate Innovation and Unicorns
- Build Trust in the System
- Spearhead Digital Trade
- Develop and Attract Diversity
- Customise Sector Specific Positioning

Islamic FinTech | Industry 4.0 High-value Manufacturing | Digital Creative Content | Global Business Services | Global Tech Testbed

Achieved through

Public Private Sector Collaboration in 10 Strategic Priorities

Strategic investment priorities

1. Accelerate 5G
2. Encourage Cloud First Adoption
3. Digitalise Industry and Economy
4. Drive Industry 4.0 Focus
5. Digitalise and Integrate Trade Value Chain and Ecosystem
6. Spur Innovation and R&D Ecosystem
7. Foster Continuous Upskilling and Reskilling
8. Embed Culture of Digital Security
9. Create Value-driven Differentiators
10. Supported by Policies Synchronisation

Coordinated and driven by

Dedicated Digital Programme

Target audience and value identification to encourage call for action

This thought leadership publication is intended for a wide range of audience. There will be the 'Supply' audience with interest to contribute to position Malaysia as the Digital Capital of ASEAN as well as the 'Demand' audience with interest to leverage on Malaysia's current position.

'SUPPLY' AUDIENCE

Key business and technical decision makers

Policy Makers

Obtain perspective on policies required for Malaysia as ASEAN's Digital Capital

Government Bodies

Understand gaps in current landscape to position Malaysia as ASEAN's Digital Capital

Infrastructure/Service Providers

Identify development focus areas and opportunities

Global Investors

Identify digital prospects in Malaysia and ASEAN market

Global Think Tanks

Understand digital prospects and identify opportunities for digital agendas

Academia

Understand the focus of talent development and support with research and development (R&D), innovation and commercialisation

'DEMAND' AUDIENCE

To be informed and educated

Citizens

Recognise digital opportunities and required skills

Enterprises and SMEs

Identify digital trends and opportunities in Malaysia and ASEAN

Startups

Identify opportunities and assistance available in Malaysia and ASEAN

Industry Associations

Identify digital and innovation opportunities for respective industries

ASEAN Countries

Understand digital position and leverage on the Digital Capital to accelerate own digital journey

CHAPTER 1

Malaysia as ASEAN's Digital Capital

Malaysia as ASEAN's **Digital Capital**

COVID-19 has profoundly impacted livelihood globally, creating a great deal of disruption to the world economy. Rapid digital transformation is crucial to rebuild forward better. Malaysia is well-positioned to capitalise on digital opportunities given its competitive advantage and national infrastructure. The country has immense potential to position itself as ASEAN's Digital Capital with three focus centres:

Centre of Interest

Cross-borders, cross-sectors, cross-businesses ecosystem, partnerships and investments

Centre of Excellence

Fountainhead of digital infrastructure, resources, capabilities and services

Centre of Innovation

Value driven digital business models and products driving growth

Opportunities for Malaysia as the ASEAN Digital Capital

ASEAN, which has the third largest population in the world after China and India, and a total combined economy of about US$3 trillion – the 5th largest economy in the world after the United States, China, Japan, and Germany – will increasingly become a key player in the global economy. Given Malaysia's strategic advantages, becoming ASEAN's Digital Capital will contribute to sustainable domestic economic growth. It is estimated that the digital economy is expected to contribute up to 35% of GDP or approximately RM1.8 trillion in national GDP, and 1.5 million jobs within the next decade. The digital economy has a significant economic multiplier effect, and every ringgit invested can contribute between RM4.4 and RM20 to the Malaysian economy.

Income and Employment

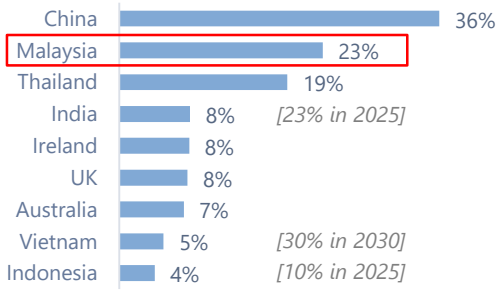
RM1.8 trillion
incremental[1] GDP

Additional digital economy potential by being ASEAN's Digital Capital, cumulative 2021–2030 *(digital economy growth from ~8% to 12% contributing 35%[2] of GDP in 2030)*

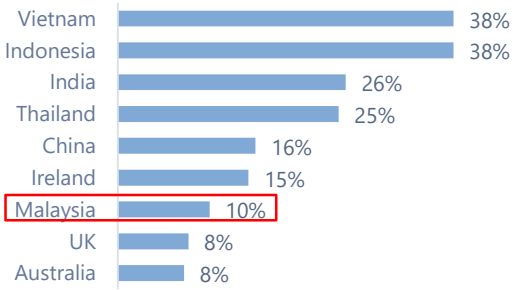
1.5 million
incremental jobs

Exciting job opportunities will arise with the advent of Malaysia as ASEAN's Digital Capital, cumulative 2021–2030

Digital economy contribution as % of GDP

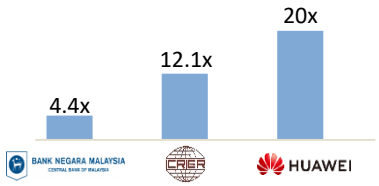


Digital economy growth



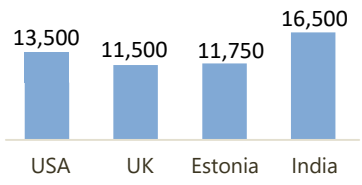
Sources: DOSM; China Academy of Information and Communications Technology; The Nation Thailand; Ireland Department of Communications, Energy and Natural Resources; UK Department for Digital, Culture, Media and Sport; The Mandarin; Brookings; W.Media; Jakarta Post

GDP Multiplier for each dollar investment in digital economy



Sources: BNM "Unlocking Malaysia's Digital Future: Opportunities, Challenges and Policy Responses" (2017), Indian Council for Research on International Economic Relations "Growth Dividends of Digital Communications" (2018), Huawei Digital Spillover Report (2017)

Estimated no. of jobs created from RM1 billion investment in digital economy



Sources: Oxford Economics, Economic Policy Institute (2019), LSE and ITIF "The UK's Digital road to recovery" (2009), MeitY "India's Trillion-Dollar Digital Opportunity" (2017)

[1] *Incremental GDP is based on the increase above the SPV2030 projections (RM3.4 tril GDP in 2030, with CAGR of 4.7% from 2021–2030)*
[2] *Current Digital Economy contribution to GDP at the CAGR of ~8% based on historical trends will amount to 27% of GDP in 2030*

Deriving Malaysia's positioning as ASEAN's Digital Capital

Malaysia's positioning as the Digital Capital of ASEAN can be derived from two key elements: (1) Malaysia's digital strengths and (2) ASEAN opportunities and needs.

Leveraging on Malaysia's digital strengths

Malaysia's economic transformation is relatively phenomenal; the country moved from a low-productivity agrarian-based economy to an economy based on manufacturing and services within a generation. It has successfully transformed its economy, raised living standards, and is one of the few countries that experienced remarkable growth in Gross National Income (GNI) per capita, increasing 58 times between 1957 to 2021, making Malaysia one of the fastest growing economies in modern history.

Strong digital positioning to compete

Malaysia is among the most competitive markets in the world. It is currently 2nd in ASEAN and 31st globally in terms of digital competitiveness. It is also ranked highly in terms of connectivity, cybersecurity, digital readiness and being an attractive global destination.

1st Attraction to Global Investors	2nd Digital Readiness	2nd Connectivity	2nd Cybersecurity	3rd Attractive Global Destination for GBS
in ASEAN	in ASEAN (ranked 31st Globally)	in ASEAN (ranked 32th Globally)	in ASEAN (ranked 5th Globally)	
Milken Institute Global Opportunity Index 2022	*IMD World Digital Competitiveness Ranking 2022*	*Huawei Global Connectivity Index 2020*	*ITU Global Cybersecurity Index 2021*	*Kearney 2021 Global Business Services (GBS) Location Index*

Plans and policies to drive Malaysia's digital development

The Malaysian Government recognises the importance of digital development and technology and is continuously strengthening efforts to transform Malaysia into a digital nation. The government has launched several significant action plans and policies to drive Malaysia's digital development.

Economy	Infrastructure	Security	Talent	Ecosystem
13 existing policies **9** upcoming policies	**4** existing policies **5** upcoming policies	**1** existing policy **4** upcoming policies	**3** existing policies **1** upcoming policy	**2** existing policies Multiple incentives
Selected milestones: • 35 digital-related incentives/grants • Digital Free Trade Zone	**Selected milestones:** • 96.9% of 4G coverage in populated area by 2022 • 35 Mbps mobile speed by 2022 • 5G roll out by 2022	**Selected milestones:** • Innovative solutions • Public-private partnership (PPP) programmes for capacity building	**Selected milestones:** • Industrial Skills Framework Phase 2	**Selected milestones:** • Malaysia Digital Hub • National Technology and Innovation Sandbox (NTIS)

Current digital landscape as a foundation

The Malaysian digital economy contributed to approximately 22.6% of GDP in 2020, and it has grown at an average rate of 8.5% over the last five years. In terms of infrastructure, over 90% of Malaysia's populated areas is covered with 4G LTE. Nearly 97% of Malaysians are internet users, mostly driven by mobile broadband access, and 86% of Malaysians are active social media users. Malaysia has one of the highest social media usages in the world, ranking 13th with its population spending an average of 3 hours on social media everyday. This reflects Malaysia's digital readiness, serving as a strong foundation to move towards ASEAN Digital Capital's objectives.

22.6% Digital economy contribution to overall GDP, in 2020 *Department of Statistics Malaysia*	**8%** Average annual growth of the digital economy from 2015 to 2020 *Department of Statistics Malaysia*	**95.82%** 4G LTE coverage *JENDELA phases report*	**97%** Internet Users nationwide, mainly driven by mobile broadband *Department of Statistics Malaysia*	**86%** Population actively using social media for media consumption *Digital 2021: Malaysia*

Contributing and capitalising on ASEAN opportunities and needs

ASEAN, as one of the world's top five economies, with a population of about 650 million, is becoming the driver of global economic growth. While ASEAN's digital economy is relatively small – currently only representing 7% of the global digital economy GDP, as compared to 16% in China, 27% in Europe and 35% in the United States of America (USA) – ASEAN and its member countries have great opportunities in expanding its digital economy, especially post-COVID-19 pandemic.

COVID-19 as the digital catalyst

Due to the COVID-19 pandemic, digital transactions and activities are becoming more prominent. Many countries have accelerated their technology adoption in digitalising their economies to cope with this unprecedented disruption. For instance, Australia1 and Singapore2 have introduced and accelerated their structural policies to cope with the new demand for digital technology during the pandemic. China has planned RMB49.6 trillion investments for 22,000 infrastructure projects including 5G, Artificial Intelligence (AI), Internet of Things (IoT) as well as other non-digital infrastructure investments, of which RMB7.6 trillion was planned for 2020 to cushion the economy after the nationwide lockdown.

This pandemic has shifted consumer behaviour, with remote working becoming the new normal, and innovative business models emerging. Contactless payment platforms and transactions have seen exponential growth, both in user and transactional volume, and is expected to continue to increase.

Essentials are moving online

45% of ASEAN consumers have increased online buying of groceries

Discovery of new apps accelerates

84% of ASEAN consumers have tried new apps and disrupted industries

Contactless habits

70% have increased stay at home habits; growth in contactless payment platforms

Source: Bain and Co

[1] Australia has moved forward its planned capital expenditure investments from 2021 to 2020 to increase network capacity and accelerate 5G rollout
[2] Singapore has brought forward the investment in its digital initiatives such as National Digital Identity and Moment of Life, which will integrate public services onto a single platform, to accelerate digitalisation

Source: Telestra; W.Media; China Ministry of Commerce

Need for better technology infrastructure

83% of large listed companies and **84%** of SMEs emphasised difficulties in online connectivity and communication with customers and suppliers

Enhanced remote working approaches

32% of large listed companies and **26%** of SMEs are enhancing their remote working approaches with technical and connectivity support

COVID-19 is a game changer for digital transformation, especially for firms. EY initiated the COVID-19 Business Impact Survey to understand the impact of the Movement Control Order (MCO) on Malaysia businesses. 83% of large listed companies and 84% of SMEs highlighted the need for better technology infrastructure to improve connectivity and communication with customers and suppliers. Close to a third of companies are enhancing their remote working approaches to stay connected with employees during the lockdown period.

Advances of ASEAN countries, Malaysia to accelerate

ASEAN member countries have accelerated their digital development, albeit in different ways. For example, Indonesia has seen a strong startup and innovation ecosystem, driving unicorn development; Vietnam has a strong growth of technology skills; and Thailand, being the first ASEAN country to roll out 5G commercial services, is driving more industrial use cases and development.

Startups and Innovation

#2 in Emerging Startups Ecosystem

Global Startup Ecosystem Report 2020

Technology Skills

#1 in ASEAN Technology Skill Index

Global Skills Index 2020

Connectivity

#1 in ASEAN country to roll out 5G commercial services

Developmental ASEAN needs to capitalise

There are multiple developmental needs for ASEAN countries to enable greater digitalisation. To better position Malaysia as ASEAN's Digital Capital, it is crucial to identify and capitalise on ASEAN's need to contribute and uplift the regional digital revolution and open up massive opportunities for the regional digital economy, accelerating the progress of digital integration. There are several identified ASEAN developmental needs that Malaysia can capitalise on and create impacts, as highlighted below.

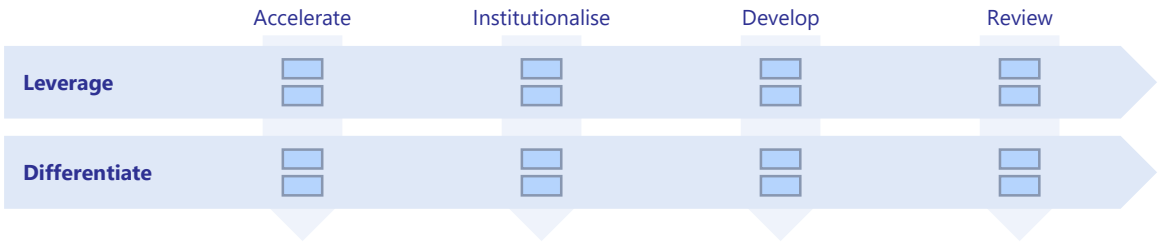
Submarine cable capacity	Lifecycle capabilities for data security	Payment platform and ecosystem
Tier 3 and 4 data centres	Digital talent availability	Communal ASEAN funding
Industry cloud platform	Trade and supply chain capabilities	Intellectual Property creation

Deriving Malaysia's positioning

Understanding Malaysia's competitive advantage, in particular in its existing digital landscape and ASEAN's demands, will enable it to seize the opportunity to position itself as ASEAN's Digital Capital. Malaysia needs to focus on key priorities, which can be categorised into four distinct actions:

1. Accelerate current digital plans and targets
2. Institutionalise the digital adoption of existing plans and programmes
3. Develop new digital initiatives to fill the gap
4. Review existing digital plans

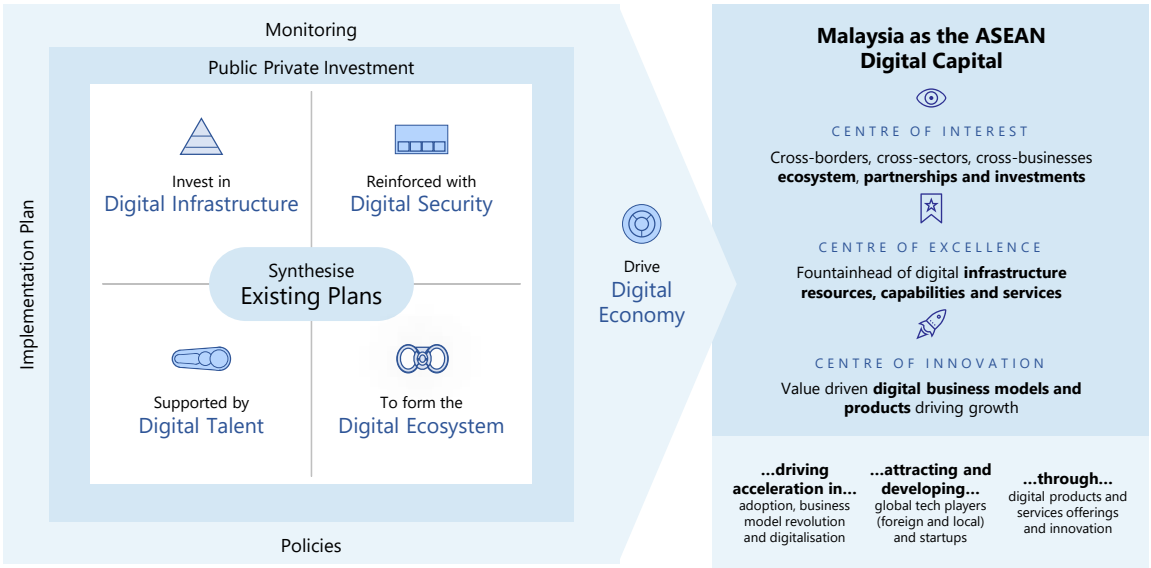
The following articulated framework has been used to list out the key priorities and positioning guidance throughout the thought leadership publication.



CHAPTER 2

A holistic approach to building Malaysia's positioning

Digital economy is key to position Malaysia as ASEAN's Digital Capital.



Various digital plans and blueprints should be leveraged on to strengthen the four Building Blocks that have been identified:

1. Invest in **Digital Infrastructure**
2. Reinforced with **Digital Security**
3. Supported by **Digital Talent**
4. To form the **Digital Ecosystem**

These four Building Blocks will contribute towards driving the Digital Economy, with the participation and investment from both public and private sectors. Execution remains a key factor, with continuous monitoring to ensure timely implementation of the outlined strategies.

Synthesising the Existing Plans

Malaysia is well-placed with its strong digital foundation and multiple national plans to drive the digital agenda. The Shared Prosperity Vision 2030 is the primary national plan for Malaysia with the aim of improving the standard of living for all Malaysians by 2030. This is supported by the 12th Malaysia Plan (RMK-12), which features the digital economy in driving the nation's development. Malaysia's digital economy strategy is outlined in the Malaysia Digital Economy Blueprint, which was launched in February 2021.

Primary National Plans and Policies

Shared Prosperity Vision 2030

RMK-12 (2021–2025)

Other Digital and Digital-related Plans and Policies

EPU — Malaysia Digital Economy Blueprint

EPU — National Fourth Industrial Revolution (4IR) Policy

MOSTI — Malaysia National Artificial Intelligence Roadmap

MDEC — Malaysia Digital

National Agrofood Policy 2021-2030 (NAP 2.0)

K-KOMM — National Digital Infrastructure Plan (JENDELA) – K-KOMM

MOSTI — National Robotics Roadmap 2021-2030

MOSTI — National Science, Technology, and Innovation Policy 2021-2030

MOSTI — E&E Roadmap: Technology Development 2021-2030

MOSTI — National Advanced Materials Technology Roadmap 2021-2030

MOSTI — National Policy on STI 2021–2030 - MOSTI

MITI — National e-Commerce Strategic Roadmap - MITI

MDEC — National Big Data Analytic Framework - MDEC

MIMOS — National IoT Strategic Roadmap - MIMOS

MITI — National Industry4WRD Policy - MITI

MAMPU — Public Sector ICT Strategic Plan - MAMPU

NACSA — Malaysia Cyber Security Strategy - NACSA

MIMOS — Digital Technology Roadmap 2020 - MIMOS

MDEC — National AI Framework - MDEC

MDEC — National Digital Talent Development Strategy - MDEC

KPKT — Malaysia Smart City Framework - KPKT

EPU — National Energy Policy

Financial Sector Blueprint 2022-2026

MPC — Malaysian Productivity Blueprint - MPC

MEDAC — National Entrepreneurship Policy - MEDAC

MOE — Malaysia Education Blueprint 2013–2025 - MOE

MOHE — Malaysia Higher Education Blueprint 2015–2025 - MOHE

MOT — National Transport Policy -MOT

MITI — National Automotive Policy 2020 - MITI

MOA — Malaysia Agrofood Policy 2011–2020 - MOA

Non exhaustive

Upcoming Plans and Policies (non-exhaustive)

- Digital Content Ecosystem Policy (K-KOMM)
- National Data Sharing Policy (K-KOMM)
- National Digital ID (MCMC)
- Public Sector Big Data 2.0 (MAMPU)
- New Services Sector Blueprint (MITI)
- National Human Resource Blueprint (MOHR)
- National Consumer Policy (KPDNHEP)
- National Social Protection Policy (MyPSC)
- National Construction Policy (MOW)

Align with: ASEAN ICT/Digital Masterplan

Digital *Digital-related* *Revised plan/policy is currently in development*

Malaysia has set up the National Digital Economy and Fourth Industrial Revolution Council to ensure effective execution of the digital plans and policies. The council is chaired by YAB Prime Minister with the Economic Planning Unit acting as its Secretariat. The council consists of six clusters:

1. Digital Economy
2. Data and Digital Infrastructure
3. Government
4. New Technology
5. Digital Talent
6. Community

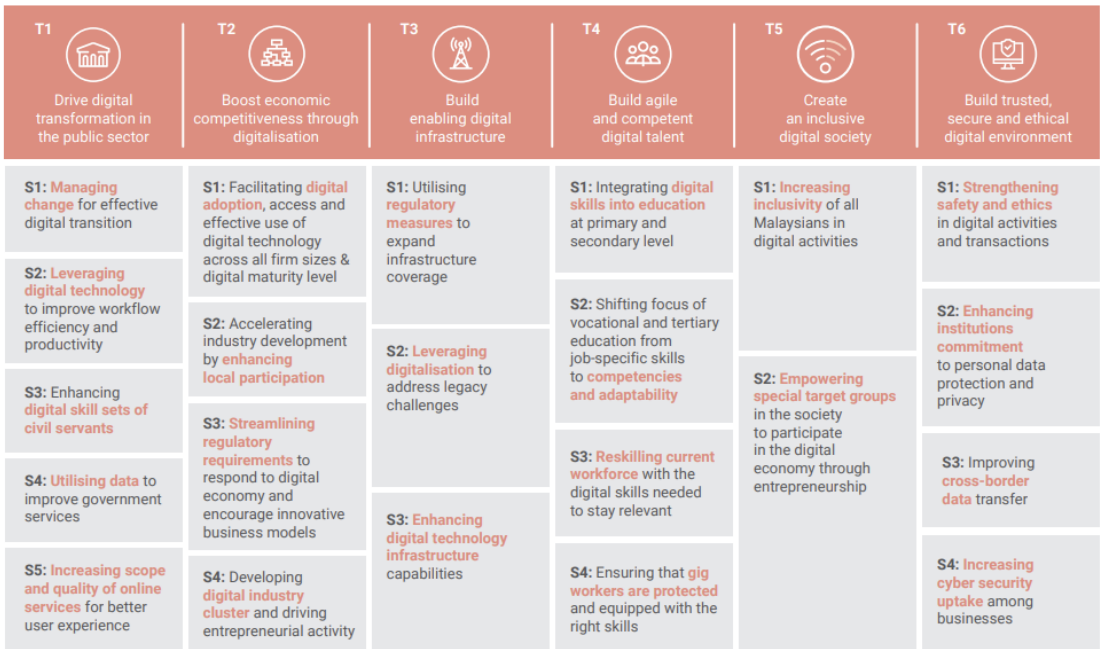
MyDIGITAL and the Malaysia Digital Economy Blueprint

Established on September 2021, MyDIGITAL is a national initiative which symbolises the aspirations of the Government to successfully transform Malaysia into a digitally-driven, high income nation and a regional leader in digital economy. The Malaysia Digital Economy Blueprint was formulated to deliver the aspirations of MyDIGITAL. Through the Blueprint, Malaysia is aiming to become a regional leader in the digital economy and achieve inclusive, responsible, and sustainable socioeconomic development.

The Blueprint contains 6 strategic thrusts, 22 strategies, 48 national initiatives, and 28 sectoral initiatives, all of which encompass the four identified domains of the digital economy as previously stated: Infrastructure, Security, Talent, and Ecosystem. The first phase of the Blueprint (2021 to 2022) focuses on strengthening the digital foundation needed for the future phases, which includes building and enhancing necessary infrastructure. Phase 2 (2023-2025) will focus on driving digital transformation and inclusion, while Phase 3 (2026-2030) will focus on strong, sustainable growth to eventually position Malaysia as a regional market producer for digital products and a digital solutions provider. The intended outcome of the Blueprint is three-fold: to ensure the socio-environmental wellbeing for all, business growth in all sectors, and establish a fit-for-future government.

The Six Strategic Thrusts of the Malaysia Digital Economy Blueprint

The outcomes of the Blueprint will impact people, businesses, and the Government.



Sources: EPU; Digital Economy Blueprint

State of Malaysia's Digital Integration Compared to ASEAN Countries

The state of Malaysia's digital integration against other ASEAN countries is a useful starting point to position the country as ASEAN's Digital Capital. The inaugural report by the ASEAN Coordinating Committee on Electronic Commerce (ACCEC) in 2021, the first of its kind which analysed the level of digital integration in different ASEAN economies, shows that the digital economy would add about US$1 trillion to ASEAN's GDP over the next 10 years. The ASEAN Digital Integration Index (ADII), which measures digital readiness, shows that ASEAN has some significant catching up to do with other countries in the Asia Pacific region, especially Australia, China, Japan, New Zealand, and South Korea.

The ADII consists of six pillars: 1) Digital Trade and Logistics, 2) Data Protection and Cybersecurity, 3) Digital Payments and Identities, 4) Digital Skills and Talent, 5) Innovation and Entrepreneurship, and 6) Institutional and Infrastructural Readiness.

Malaysia performs well in the ASEAN Digital Integration Index

	ASEAN	Singapore	Malaysia	Thailand	Brunei	Indonesia	Vietnam	Philippines	Cambodia	Laos	Myanmar
Aggregate Score	**56.22**	**80.70**	**72.85**	**67.24**	**62.95**	**57.45**	**57.26**	**53.99**	**37.60**	**36.57**	**25.94**
Pillar 1: Digital Trade & Logistics	55.27	82.64	67.35	**83.34**	54.97	49.67	78.5	60.61	33.91	23.22	18.51
Pillar 2: Data Protection & Cybersecurity	62.81	89.7	**91.27**	87.91	67.46	78.43	63.05	72.49	24.76	32.58	20.41
Pillar 3: Digital Payments & Identities	58.84	**86.6**	79.2	69.73	87.56	59.73	58.33	31.89	41.2	44.53	32.93
Pillar 4: Digital Skills & Talent	48.21	**63.79**	57.85	43.76	53.31	45.64	38.38	53.13	36.56	43.89	19.58
Pillar 5: Innovation & Entrepreneurship	49.32	**71.08**	59.22	56.09	42.99	48.81	44.55	46.93	38.19	36.91	19.58
Pillar 6: Institutional and Infrastructural Readinesss	62.85	**90.36**	82.19	62.61	71.42	62.44	60.72	58.89	50.97	38.27	44.65

Notes: Underline denotes highest score in respective Pillar.
Sources: ASEAN Coordinating Committee on Electronic Commerce (ACCEC)

Malaysia is ranked 2nd highest among all ASEAN economies, behind Singapore. Malaysia has expended considerable effort in preparing for the digital economy, and its Institutional and Infrastructural Readiness score (82.19) underlines its commitment, making Malaysia highly suitable to be ASEAN's Digital Capital. Malaysia's performance in Data Protection and Cybersecurity is the highest among other ASEAN economies, due to its personal data policies, its commitments and agreements with international standards, and its cybersecurity strategy, as enshrined in the Malaysia Cyber Security Strategy (MCSS) 2020-2024. However, Malaysia needs improvement in Pillar 4, Digital Skills and Talent. In this regard, Malaysia is addressing its talent issues by providing digital skills and talent through MyDIGITAL and the Malaysia Digital Economy Blueprint.

CHAPTER 3

Digital Infrastructure is fundamental to the digitalisation journey

Chapter Overview:

This chapter covers:

- Key drivers of Digital Infrastructure, namely, Digital Economy, Industry Digitalisation and Inclusive Growth
- Components of Digital Infrastructure, namely, Connectivity, Storage & Processing and Terminals & Devices
- Key efforts required to further accelerate towards building a future state, namely, Innovation Capital, Data & AI Capital and Trade Capital

CHAPTER 3

Digital Infrastructure is fundamental to the digitalisation journey

Why Digital Infrastructure?

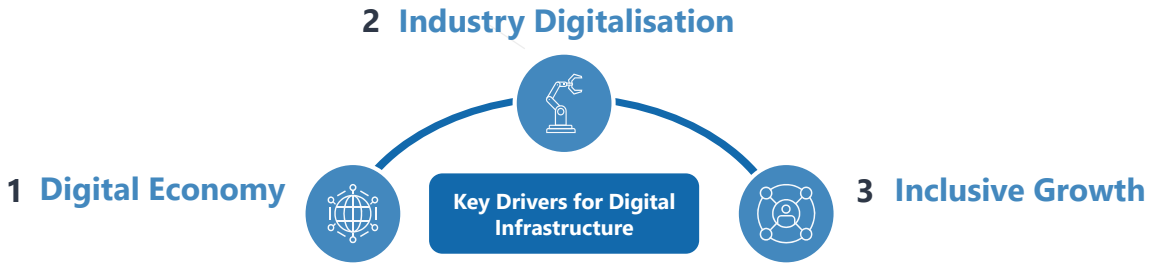
Digital infrastructure is a vital prerequisite and enabler for unlocking digital economic activities and applications.

Robust connectivity and infrastructure is important to enable industrial innovations, value-added digital activities and productivity improvements that can lead to inclusive growth and socioeconomic wellbeing. COVID-19 has underlined the importance of digital infrastructure and how it would facilitate accelerating digital adoption in various economic sectors.

Creating ubiquitous, resilient and affordable digital infrastructure as the new engine for growth of the digital economy

What are the top demand drivers for Digital Infrastructure?

Digital infrastructure is driven by three key factors, i.e. digital economy, industry digitalisation and inclusive growth, to build a scalable and future-proof digital infrastructure capital and differentiators for Malaysia to be ASEAN's Digital Capital.



Connectivity underpins the entire Digital Economy

Digital economy is estimated to grow 2.5 times faster than the non-digital economy. The physical infrastructure that connects businesses, people, and opportunities has played a strategic role in growing the digital economy. Huawei's Digital Spillover White Paper indicates that by 2025, 24.3% (USD23 trillion) of the global economy will be digital, and the economic returns on ICT investments are expected to register 6.7 times higher than non-ICT investments. Currently, more than 170 countries including Germany, United Kingdom (UK), India and Malaysia have undertaken accelerated connectivity initiatives as one of their core national strategies.

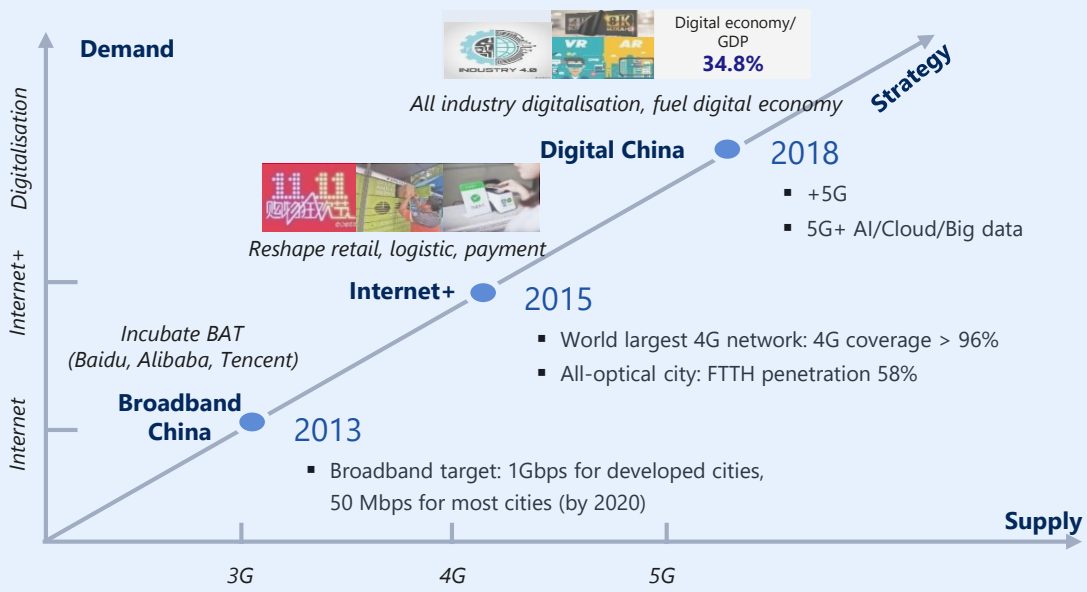
CASE STUDY

China's Digital Strategy

With China's digital strategy, the country aspired to achieve 34.8% digital economy/GDP with a massive connectivity backbone consisting of:

- 5G and AI/Cloud/Big data
- World's largest 4G network: 4G coverage > 96%
- All-optical city: Fiber-to-the-Home (FTTH) penetration 58%

China Digital Strategy
"Accelerate The Construction Of Digital China"



Source: Huawei "Digital Spillover" white paper; ITU

Today, the Government is in the process of executing the JENDELA National Digital Infrastructure Plan and deploying 5G through Digital Nasional (DNB) under the Ministry of Finance, aimed at achieving high speed nationwide digital connectivity. However, although Malaysia has a strong foundation of digital connectivity, several challenges need to be addressed.

Malaysia's Connectivity Current State, National Aspirations and Challenges

Current State

96.8%	40.13 Mbps	123 Mbps
Internet users	Average mobile broadband speed	Average fixed broadband speed

National Aspiration

80%	100 Mbps	Gigabit	100%
National coverage in populated areas, by 2024	Mobile broadband speed via 5G, by 2025	Fixed broadband speed by 2025	Coverage of 4G in populated areas, by 2025

Challenges To Be Addressed

Average Download Speed

- Fixed Broadband Speed: Lags behind Singapore and Thailand
- Mobile Broadband Speed: Lags behind Singapore, Thailand and Vietnam

Spectrum Allocation Strategy for 5G

- Philippines and Thailand launched in Q1 2020
- 2G/3G impacting 4G/5G capacity

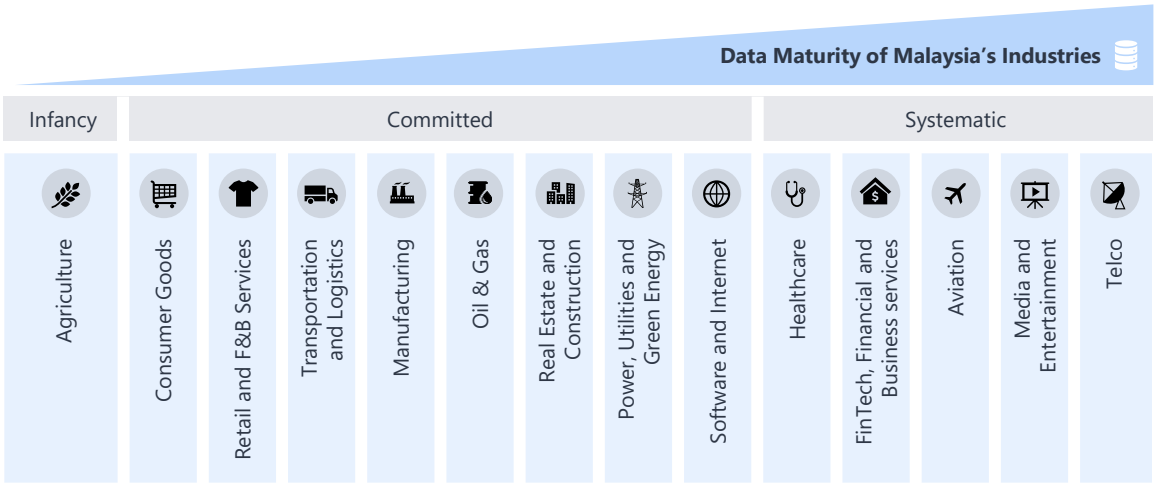
Deployment and competitiveness of fixed broadband services

Sources: DOSM 2022; Speedtest July 2022; MCMC's JENDELA Q1 2022 Report; MDEC; GSMA; MCMC Q1 2022 Facts and Figures

Industry digitalisation led by innovative technologies and 5G providing competitive products and services

Data is the new currency and it is being generated in everything we do. Globally, people generate 2.5 quintillion bytes of data every day. Businesses have implemented various strategies to store, harness and leverage data to make better business decisions and build innovative products and services for their customers. The underlying infrastructure such as cloud computing, Artificial Intelligence (AI) and 5G have enabled businesses to build innovative communication products and services such as:

- **Massive machine type communications** – smart wearables, smart houses, smart manufacturing, connected energy
- **Ultra reliable low latency communications** – automated traffic control and autonomous vehicles, remote control heavy machinery, collaborative robots



Source: "Malaysia AI Blueprint 2019" published by BIGIT Disruptive Tech Institute

Above is an assessment of the big data analytics maturity level for various industries in Malaysia. Each level of data maturity will require different level of investments in digital infrastructure in order to accelerate its digital growth:

- **Infancy (e.g. Agriculture)** – Reliable connectivity for data collection
- **Committed (e.g. Consumer Goods, Oil & Gas, Manufacturing)** – leading storage & processing capabilities for data-driven decision making
- **Systematic (e.g. Healthcare, Aviation, Telco)** – advanced computing power for enabling predictive analysis

In Malaysia, several national plans such as the National 4IR Policy, Malaysia Digital Economy Blueprint, National Industry 4WRD Policy and National AI Framework are in place to bridge the gap and aim to build a resilient infrastructure in fostering innovation and rapid business growth.

Malaysia's Industry Digitalisation: Current State, National Aspirations and Challenges

Current State

#8
Cloud Readiness Index 2020

48
Local AI companies

Ready public cloud
for enterprises and industries (TM One Cloud Alpha)

National Focus Areas

Cloud eCommerce Data analytics AI
Data centres IoT Smart cities 5G

Challenges To Be Addressed

Local Data Centres

- Primarily domestic and focused on providing colocation services
- Lack of cloud-ready capabilities

Computing Infrastructure

- Lack of capabilities to holistically manage cloud and to develop AI solutions

Data Ecosystem and Data Sharing

- Businesses not incentivised to migrate data to cloud
- Lack of a robust Data ecosystem to drive AI

Capacity Building

- Cloud and AI policies currently in development
- Future-ready workforce

Source: Asia Cloud Computing Associations "Cloud Readiness Index 2020"; MDEC; Research Institute for ASEAN and East Asia (ERIA) "Improving Digital Connectivity for e-Commerce"; MDEC, 2022: Digital Economy Blueprint

Inclusive growth will improve quality of life, creating a more sustainable and inclusively prosperous nation

Inclusive growth is fundamental to sustainable economic development and wellbeing. Reducing economic gap is important, including reducing the digital gap between those who are digitally connected, and those without digital connection.

Everyone must have access to digital technology. This entails ensuring the availability, accessibility, quality and affordability of all digital infrastructure components.

CASE STUDY

France's Home Broadband Development

In 2017, the Government of France announced its intention to achieve 100% coverage of 30 Mbps by 2020. Relying solely on Fibre-to-the-Home (FTTH) technologies, this timeframe would have been unrealistic, therefore France adopted a Fibre and Fixed Wireless Access (FWA) synergy strategy. FWA providers were allocated 3.5 GHz spectrum in portions of between 40 MHz and 50 MHz. At this bandwidth, speeds of up to 220 Mbps can be supported. The newly allocated spectrum is not allowed to be used for mobile broadband services before 2026 to ensure high connectivity coverage.

Malaysia's Inclusive Growth: Current State, National Aspirations and Challenges

Current State

124.1%	95.7%	7 million	40.13 Mbps
Mobile broadband penetration	Mobile 4G/LTE coverage	premises passed with Fibre Connectivity	Average Mobile Broadband speed

National Aspiration

100%	9 million	CIMS[1]
4G coverage by 2025; 97% coverage by 2022	premises passed by 2025; 7.5 million by 2022	Readily accessible GIS[2] map

Challenges To Be Addressed

Urban-rural Connectivity

- 4G coverage is second only to Singapore, but speeds are behind Singapore, Vietnam, and Thailand

Suboptimal Accessibility

- Fixed broadband penetration at approximately 41.9% of population

Note:
[1] Communication Infrastructure Management System
[2] Geographic Information System

Sources: MCMC's JENDELA Plan; MDEC; GSMA; MCMC Q1 2022 Facts and Figures

Three key components to strengthen the drivers of Digital Infrastructure

Malaysia's digital infrastructure can be improved by focusing on key vital components to create a resilient and sustainable digital backbone, ultimately transforming the digital infrastructure.

DRIVERS	COMPONENTS **Connectivity** The physical infrastructure that carries data between devices, data infrastructure and services	**Storage & Processing** The computing power to store and run services of users and application data	**Terminals & Devices** The interfaces between users (human or machines) and the digital services and applications
Digital Economy	International, regional, national and local connectivity infrastructure	Local cloud infrastructure to stimulate the Malaysian digital economy *(e.g. Infrastructure-as-a-Service, Platform-as-a-Service)*	Consumer IoT, Industrial IoT, chipset marketplace
Industry Digitalisation	High-speed connectivity to utilise emerging technologies *(e.g. Fixed Wireless Access, 5G, Industry IoT)*	Advanced computing to develop real-time applications *(e.g. Edge enabling autonomous vehicles)*	AI-enabled devices to perform computing internally *(e.g. enabling facial recognition in Smart Cities)*
Inclusive Growth	Nationwide connectivity to ensure all citizens benefit from digitalisation *(e.g. Fixed Wireless Access for universal service coverage; fiber for gigabit broadband; 4G strengthening in cities and urban areas; 5G rollout)*	Data-driven economy to increase demand for storage & processing *(e.g. local data centres in each economic corridor)*	Consumer devices to ensure all citizens benefit from digitalisation *(e.g. affordable smartphones for all students)*

Malaysia could unlock the following value propositions by having a robust and sustainable digital infrastructure:

Connecting People and Places

Enable a secure digital environment for individual, businesses and government

Adopting new Technologies/ Solutions

Trusted data and resources to accelerate R&D and innovation

Data-driven decision making

Quicker and better informed decision making; improving productivity and experience

Inclusivity and Sustainability

Improve quality of life, creating a more sustainable and inclusively prosperous nation

Deep dive into the Digital Infrastructure components

For Malaysia to position itself as ASEAN's Digital Capital, it is essential that investments required are across **Connectivity, Storage & Processing, Terminal & Devices.**

Connectivity

Connectivity is an important fundamental building block of digital infrastructure, connecting over 2.5 billion people to the Internet globally. ASEAN has the fastest growing population of internet users, with 125,000 new users added daily. The ASEAN digital economy is projected to add USD1 trillion to GDP in the next 10 years.

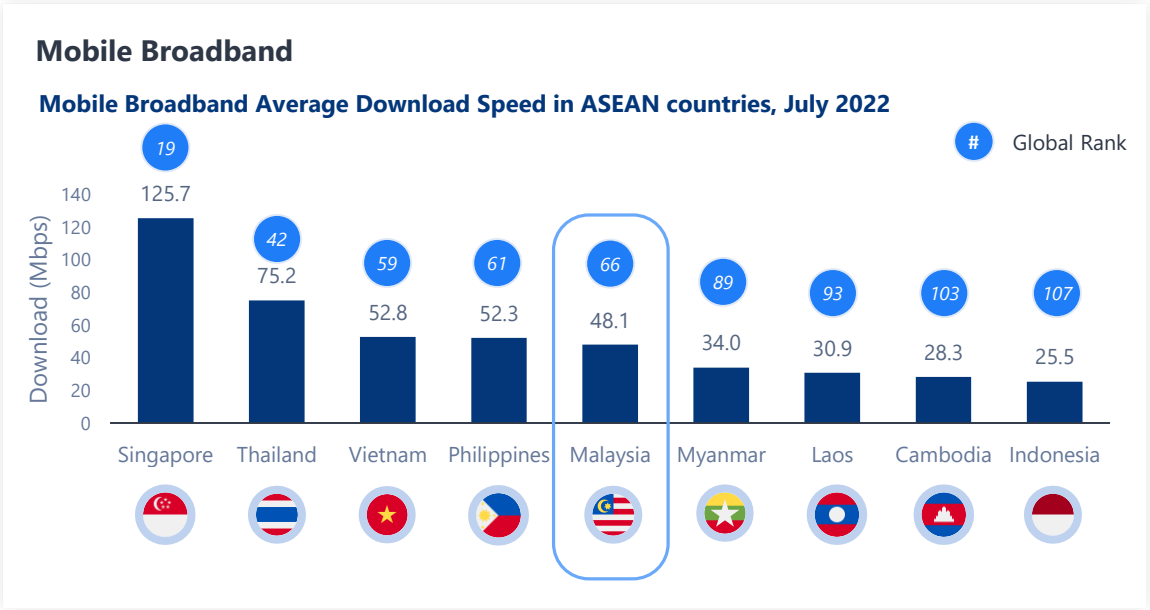
This ability to continuously access vast amounts of information is enabled by the physical infrastructure that carries digital data between devices, data infrastructure and services. The physical infrastructure of broadband access can be broken down into these connectivity types, namely:

- **Mobile broadband** – data communication whereby users' mobile devices (e.g. smartphones and tablets) connect to the Internet wirelessly via cell towers. Network performance is dependent on the nature of coverage available in a given area. Over the last three decades, mobile broadband has evolved from 2G, through 3G, to the now dominant 4G and the emerging 5G standard.
- **Fixed broadband** – data communication between two or more fixed locations via a wired network such as optical fiber (Fiber to the home: FTTH), cable, Digital Subscriber Line (DSL).
- **International internet connectivity –** data transmission/connectivity between countries that is enabled through a network of undersea cables stretching across the ocean's floor.

Mobile broadband

Malaysia's mobile broadband coverage has reached above 95%. The Government planned to shut down 3G networks by the end of 2021, and as of end Q1 2022, 99% of 3G carriers have been shut down, with the remainder (located in remote areas) to be shut down by December 2022. This will free up more spectrum for 4G networks, laying a strong foundation for 5G development. Malaysia aims to have 100% national 4G coverage by 2025.

In Malaysia, the average mobile broadband download speed currently stands at 48.10 Mbps (above the global standard target of 35 Mbps) and is ranked #5 in ASEAN as of July 2022. Malaysia has favourable opportunities and incentives for network operators to continuously upgrade and improve their infrastructure, and to implement emerging technologies (e.g. smart cities).



Sources: Speedtest July 2022; MCMC Q1 2022 Facts and Figures; GSMA

What about 5G?

5G technology is currently being rolled out around the world. The speed, reliability and lower latency attributes of 5G ensures a strong foundation for digital transformations. It enhances the connectivity efficiency between devices that allow effective adoption of emerging technologies such as IoT, Autonomous vehicles and Virtual Reality (VR).

Malaysia has initiated 5G trials in 2019. The 5G rollout will be implemented as a Single Wholesale Network (SWN), in order to lower the capital expenditure by minimising costs and preventing the duplication of infrastructure. Digital Nasional Berhad (DNB) has been appointed to undertake the deployment of 5G infrastructure and network nationwide. DNB was established to wholly support MyDIGITAL in deploying 5G in Malaysia. Malaysia is aiming to achieve 40% coverage of 5G in populated areas by the end of 2022 and 80% coverage in populated areas by 2024.

Malaysia's 5G Plan

The JENDELA National Digital Infrastructure Plan 2020–2025 has set the target for 5G deployment by 2022 with the download speed of 100 Mbps. The Plan also targets to have 4G and 5G as the mainstream connectivity in the next five years, while ensuring affordable and quality services to the users.

CASE STUDY

JENDELA National Digital Infrastructure Plan (2020–2025)

Policies

- **Blanket approval** from States and local authorities
- **Access to Federal-owned** lands and buildings
- Planned, deployed and treated as **public utilities**
- **Standardisation** of electricity **tariffs**

National aspirations (by 2022)

- **Deployment of 100 Mbps 5G**
- **35 Mbps mobile coverage nationwide**
- **Quality** and **indoor coverage improvement**

National aspirations (by 2025)

- **Gigabit fixed broadband access** to nine million premises
- **>100 Mbps mobile broadband** by adopting 5G
- **100% 4G coverage** in populated areas[1]
- **Readily accessible** digital infrastructure **map**[2]

Source: JENDELA Plan

CASE STUDY

Thailand's 5G Strategic Approach

Strong Government Driven Policies For Better Governance

- National 5G Strategy Committee, led by Prime Minister
- Thailand 4.0 Strategy to promote 5G use cases

Market driven distribution of 5G Spectrum to promote competition. Ensured adequate 5G Spectrum (190 MHz) for multiple operators via auction; Second batch planned with another 300 MHz

Speed up network deployments with clear coverage and timeline requirements

- Focused deployment for industrial areas
- Clear national 5G targets e.g. 50% geographic coverage of EEC in one year; 50% smart cities in four years; download speeds of 100 Mbps in urban areas and 50 Mbps in all other areas
- Innovative payment terms tied to coverage obligation fulfillment

REGIONAL CASE STUDY

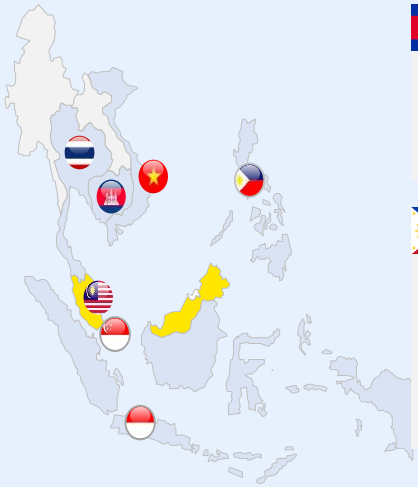
5G Status of selected ASEAN countries

Vietnam

- Initial 5G deployment was disrupted by COVID-19
- Set to launch commercialized 5G in 2022

Cambodia

- 5G rollout was outlined in the Cambodia Digital Government Policy (2022-2035) but with no specific timeline.



Thailand

- As of Q1 2022, Thailand has the highest 5G availability in the region, at 24.6%.
- Formed the Thailand 5G Alliance in June 2022.

Philippines

- Philippines has the second highest 5G availability in the region (Q1 2022).
- Rivals (e.g. PLDT Inc) following closely with rollout plans in 2020

Indonesia

- 5G has been commercially introduced by Telkomsel, IOH and XL (all in 2021).
- The government aims to complete analogue TV shutdown in 2022 and use its 700 MHz frequency for 5G.

Singapore

- Aims to rollout commercial 5G in 50% coverage by end of 2022
- By 2025, Singapore aims to have two nationwide 5G networks
- As of July 2022, Singtel has reached 95% 5G coverage, making it the first country to be fully covered by standalone 5G

Malaysia

- 2022: 5G deployment3 for 100 Mbps
- Malaysia is aiming to achieve 40% coverage of 5G in populated areas by the end of 2022 and 80% coverage in populated areas by 2024.

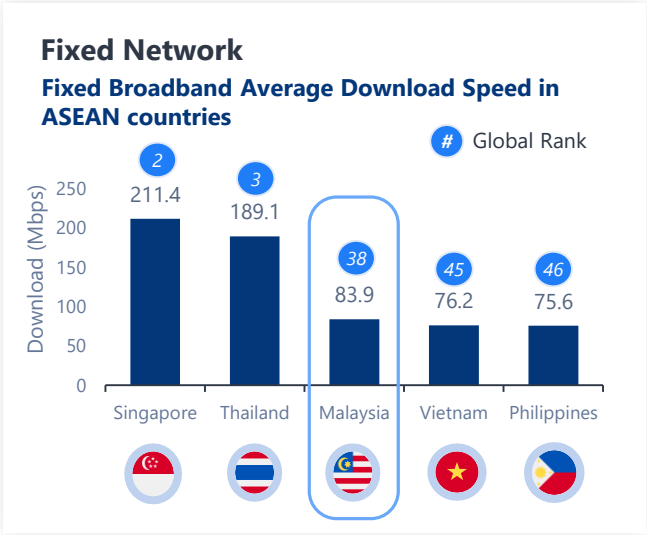
Sources: JENDELA Plan; Bangkok Post; Financial Times; Infocomm Media Development Authority of Singapore; Inquirer.net; The Jakarta Post; Khmer Times; Nikkei Asia

[1] Area covers at least 20 people per square km
[2] Communication Infrastructure Management System (CIMS)
[3] Coverage in populated areas

Fixed broadband

Malaysia's fixed coverage has reached over 7.1 million premises as of Q1 2022 and is expected to surpass 7.5 million premises by end-2022. Meanwhile, its fixed broadband penetration rate (per 100 inhabitants) is at 41.9%, an increase of 32.6% from Q1 2020 (9.3%).

JENDELA has identified Fixed Wireless Access (FWA) as the alternative technology solution to deliver ultra-high-speed broadband to suburban and rural areas, supporting home and business applications where laying and maintaining fibre would be prohibitively expensive.



Sources: Speedtest July 2022

How does Fixed Wireless Access (FWA) work?

FWA utilises the main access point to transmit high speed broadband to the last mile user's premises that has an installed receiver, enabling the user to connect to the Internet. This technology is more commonly deployed to enable internet access in rural and underserved areas due to cost effectiveness as compared to fixed line broadband. It is also effective for industrial connectivity.

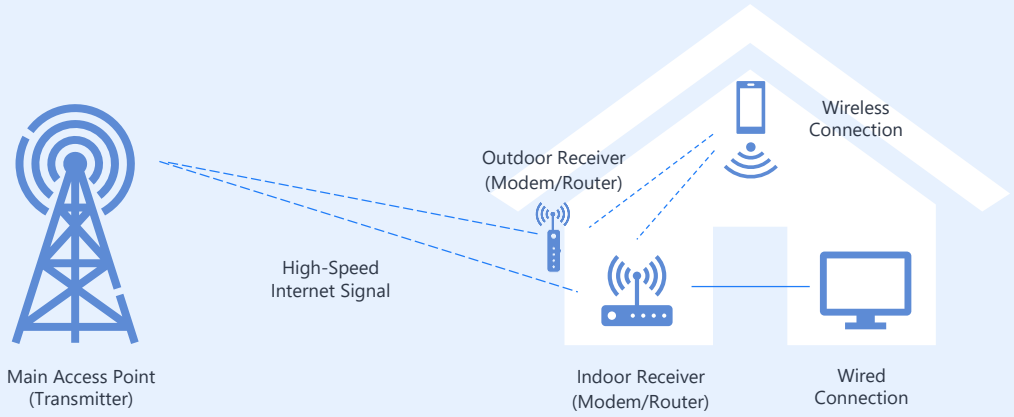


Illustration of Fixed Wireless Access connecting two fixed locations

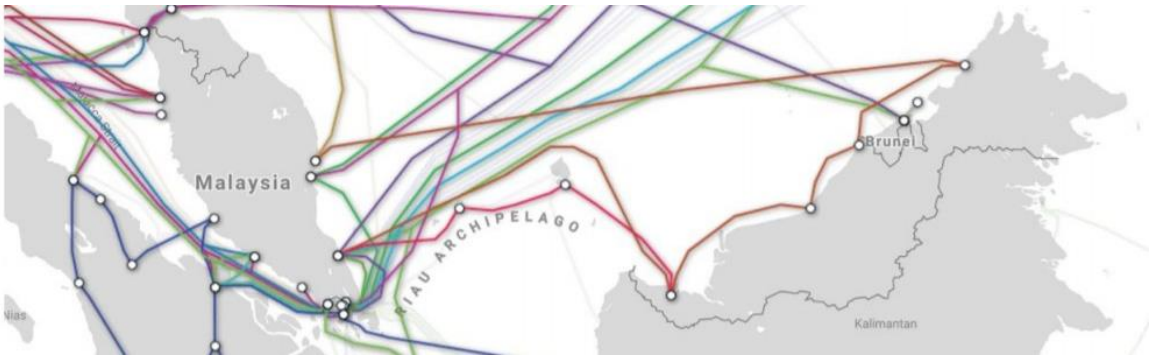
International Internet Connectivity

Most of Malaysia's international submarine cables are connected to neighbouring countries (including Singapore and Indonesia). Study shows that submarine cables have had positive effects on Malaysia's international internet connectivity consumption per user (IBWPU), and the increased broadband penetration has correlated with an increase in GDP per capita. The study noted that every 10% increase in Malaysia's IBWPU leads to a 0.24% increase in GDP per capita. Malaysia could continue to enhance its international internet connectivity and boost its global connectivity by attracting more high-tech industries and data heavy services to drive demand.

Malaysia's international internet connectivity is currently limited mainly by three factors – competition from neighbouring economies, its relatively small population, and limited high-tech industries and data heavy services to drive demand for higher bandwidth.

Key learnings to boost global investors' confidence

1. **Deployment and landing of submarine cables** are long-term, capital-intensive investments.
   - Business-friendly environment is essential to provide confidence (e.g. transparent procedures).
2. **Protection and maintenance of deployed submarine** cables will involve disputes between owners and others.
   - Countries with strong international connectivity tend to score highly on the Rule of Law Index.
   - Align laws and regulations with international practices, high standards of enforcement.
3. Attracting global investors to be supported by **compliance to international laws and effective regulatory enforcement.**
   - Telecoms regulators in leading APAC economies adopt a proactive stance in coordinating and assisting investors with this process.
   - In Singapore, regulator Infocomm Media Development Authority (IMDA) is also the lead agency to facilitate the process for application of licenses and permits.



Malaysia is currently ranked 3rd among APAC countries with a total of 21 international submarine cables. Malaysia's international submarine cables are listed below:

1. APCN-2
2. Asia Africa Europe-1 (AAE-1)
3. Asia-America Gateway (AAG) Cable System
4. Asia-Pacific Gateway (APG)
5. Asia Submarine-cable Express (ASE)
6. Batam Dumai Melaka (BDM) Cable System
7. Batam-Rengit Cable System (BRCS)
8. Batam Sarawak Internet Cable System (BaSICS)
9. Bay of Bengal Gateway (BBG)
10. Dumai-Melaka Cable System
11. East-West Submarine Cable System
12. FLAG Europe-Asia (FEA)
13. JASUKA
14. Labuan-Brunei Submarine Cable
15. Malaysia-Cambodia-Thailand (MCT) Cable
16. SAFE
17. SeaMeWe-3
18. SeaMeWe-4
19. SeaMeWe-5
20. South East Asia (SEA) Cable Exchange-1 (SEAX-1)
21. Sistem Kabel Rakyat 1Malaysia (SKR1M)

Upcoming:

1. India Asia Xpress (IAX) (2023)
2. MIST (2023)
3. SEA-H2X (2024)
4. SeaMeWe-6 (2025)

Source: TeleGeography; Submarine Cable Map

CASE STUDY

Google's investments in network infrastructure across ASEAN

Since 2010, Google has invested over USD2 billion in network infrastructure in the APAC region, contributing to improved connectivity outcomes across APAC:

- Supported 1.1 million jobs and USD430 billion in additional GDP for the region (2010–2019), and expected to generate additional 1.8 million jobs and USD415 billion (2020–2024)

Google accounts for 12% of the region's internet traffic, and is investing extensively in submarine cables and edge network equipment

- Invested and deployed six submarine cables, with remaining 2/3 bandwidth requirement being purchased from local telcos, and Google has deployed multiple Point of Presence (PoP) in 15 cities across eight countries and Google Global Cache (GGC) nodes across 278 cities

In Malaysia, Google has invested in PoP (in three cities) and GGCs (in five cities). Since 2010, Google has been investing in submarine cable landing points (CLPs) in other ASEAN countries. In August 2022, Google announced that it would build a Google Cloud region in Malaysia, alongside New Zealand and Thailand, although rollout date and data centre location have not yet been finalised.

- Submarine cables with Cable Landing Points (CLPs) in Singapore, Philippines, Brunei and Thailand.
- Upcoming Google CLPs planned for Singapore, Indonesia and Philippines

Google has also further shown intention to further increase investments in APAC.

Source: Analysys Mason, Google

KEY PRIORITIES

Execute spectrum strategy

The Malaysian Government needs to ensure and accelerate the timely assignment of the C-Band spectrum to support 5G network rollout across multiple operators. This would accelerate the sunsetting of 2G and 3G spectrum and allow more spectrum to be allocated for 4G and 5G synergy networks. Malaysia is planning to deploy 5G to five major cities and districts in Selangor, Penang, Johor, Sabah, and Sarawak by 2022. Subsequently, the 5G network will cover 17 cities across the country by the end of 2023.

Emerging technologies, i.e. Smart City, 4G and 5G technologies are expected to continue to be the key beneficiaries of mainstream connectivity in the next five years. There is a need to optimise the 4G spectrum to provide better speeds and to facilitate the launch of 5G technology.

Leading nations in 5G technology are also engaged in rapid building of 5G base stations, network infrastructure and allowing resources openness, i.e. the use existing infrastructure more efficiently. Proper planning of spectrum deployment will achieve a lower acquisition cost for telco companies and this benefit will translate to consumers for a better connectivity experience at an affordable price. In order to facilitate better premises connectivity, dedicated spectrum allocations for FWA use cases may be considered.

Connectivity coverage and affordability

Malaysia is required to accelerate FWA deployments which could expedite adoption of digital applications. The efficiency of FWA deployment can be improved via blanket approval from the State and local authorities, access to federal-owned lands and buildings as well as the standardisation of electricity tariffs. Additionally, Malaysia could increase the competition between telecommunication players to drive cost-effective solutions and better product/service quality for customers. These two approaches will promote indoor mobile and fixed broadband coverage and enable wider adoption, especially for rural and underserved areas.

Expand international internet connectivity

Malaysia could expand its domestic data demand through the introduction of various data heavy services. It could focus on expanding specialty areas, e.g. Islamic Finance (IF) and digital content whilst attracting foreign data companies to set up data hosting facilities in Malaysia.

Increasing the competition within the submarine cable industry could also be considered in the currently protected domestic industry. This would lead to building of more cable capacities and market competitiveness that could generate additional revenue.

Setting measurable outcomes

Malaysia could also identify and execute granular Key Performance Indicators (KPIs) for fixed, mobile and indoor mobile broadband to drive overall user experience and achieve national aspirations. Governance may also be strengthened in order to track, monitor and measure the achievability of the set KPIs.

Storage & processing

High digital data and traffic volume growth must be supported by high performance computing infrastructure. Optimal computing resources can make businesses more efficient and drive new business models. Storage and processing components can be broken down into several key layers:

- Data centres and cloud platforms
- Artificial intelligence
- Edge platform and devices

Data centres & cloud platform

Data centres – a large group of networked computer servers, network and security devices and storage systems that are centrally housed in a facility – are typically used by organisations for storing, processing and distributing large amounts of data and applications.

Cloud providers use the same infrastructure on an even larger scale, and offer storage, processing, and hosting services to clients. Clients create and manage computing resources virtually and are freed of the burden of building and maintaining their own infrastructure. Cloud platforms include both general purpose and industry-specific solutions which assist industries in transforming their businesses, further improving competitiveness.

Cloud General-purpose Solutions

- Computing
- DevCloud
- Application Services
- Storage
- Security
- Domain names and websites
- Network
- Video
- IoT
- Dedicated Cloud
- Management and Deployment
- Database
- Migration
- Cloud Communications
- Enterprise Applications
- Enterprise Networks
- Edge Cloud Services
- Enterprise Intelligence

Industry-Specific Solutions

Public Services
- Smart City
- Incident forecasting
- Smart transportation

Manufacturing
- Defect detection
- Industrial IoT
- Predictive maintenance

Healthcare
- Early prevention
- Tech-assisted diagnosis
- Precision medicine

Logistics
- Route planning
- Monitoring of goods
- Auto sorting

Finance
- Document processing
- Real-time fraud prevention
- Precision decisions

Education
- Personalised content
- In-line translation
- Robots in education

A public cloud platform could support the development of a strong ecosystem that drives national-scale, industry transformation. It could also enable an incubator platform for local Independent Software Vendors (ISV) to develop industry-specific solutions that comply with local regulations. A public cloud brings six key benefits:

Key benefits of public cloud adoption

CASE STUDY

TM One Cloud Alpha is a nationwide, in-country cloud platform focused on providing end-to-end integrated solutions, including 5G connectivity, hardware and software AI components. It has a total of 190 industry-specific and general purpose solutions and enables: 1) Incubation of local talent for industry specific transformations, 2) Enabler for local ISV as part of a comprehensive business partner ecosystem, strengthening industries based digital transformations, 3) Tailored to respond to local compliance needs and in-country business requirements and processes, and 4) Provides a complete foundation for today's and tomorrow's digital businesses.

Credence, a TM company, was launched in July 2022 as a cloud and digital services company focused on expanding the capabilities and infrastructure of enterprises and the public sector. It provides end-to-end solutions for its customers, leveraging on both local and international technologies. Its offerings include capabilities from tech infrastructure to business insights, cloud advisory, IT landscape migration, SaaS, managed services as well as analytics and insights.

Artificial Intelligence (AI)

AI is a broad set of technologies that include machine learning, natural language processing, speech recognition, computer and machine vision and robotics. These technologies can be combined to create new capabilities for specific industry needs. Key drivers of AI are to improve customer engagements and higher competitiveness as AI is able to perform predictive analysis and enhance decision making. In 2019, it was found that there were 48 Malaysian AI companies (and growing) in Malaysia focusing on top 5 growth sectors such as Transportation, Public Services, Education, Healthcare and Agriculture. This has led to Malaysia having the second highest number of AI companies across ASEAN. Malaysia is witnessing greater AI adoption across higher digitalised industries such as manufacturing, crime prevention and healthcare.

Manufacturing

Automation and robotics to enable product design and development, further increasing productivity

Crime Prevention

Sophisticated computer vision, AI and deep machine learning algorithms for behaviour analysis

Healthcare

Deep learning algorithm for real-time monitoring. Potentially improves patient and elderly care with AI

There are a few key enablers that could further expedite the development of AI in Malaysia, and MDEC is currently developing the national AI framework to provide the industry with a clear direction to harness the benefits of AI.

Key Enablers for AI

Policy
Develop enabling policies and frameworks to increase adoption

Technology
Ensure enabling technology environment for AI innovation and commercialisation

Talent
Invest and grow AI talent, to prepare for the workforce of the future

Data Ecosystem
Develop robust data ecosystem to drive industry growth and enhance competitiveness

CASE STUDY

China's AI and Big Data Strategy

Since 2016, China has adopted the "13th Five-Year Plan", "Internet Plus and AI Three Year Implementation Plan" and "New Generation Artificial Intelligence Development Plan" to accelerate its national big data plan and AI capabilities. China focus domain and areas are AI Product/AI+, Smart Manufacturing, AI Fundamental and AI Supporting System.

The AI policy also outlines the final goal of building a USD150 billion core AI industry and a USD1.5 trillion worth AI-related industry, and becoming the global leading innovation power for AI by 2030. As a result, a total of 31 China local big data authorities were successively established to take charge of unified management of big data especially government data. This accelerated China's initiative in data integration and sharing, and it has completed on the national and province levels.

11 AI Innovation and development experimental zones have been established by the Chinese Government and 15 AI Innovation and Open Platforms are backed by private sector companies such as Baidu, Alibaba and Tencent.

United Arab Emirates (UAE) local company driving AI and Cloud

Group 42 (G42) is an Abu Dhabi based AI and Cloud Computing company. G42 performs fundamental and applied AI research, and deploys AI-centric industry solutions across a range of industries such as government, healthcare, finance, oil & gas and aviation. It targets to be the largest and most powerful cloud computing capability in the region.

Group 42 has partnered with Digital Dubai Electricity and Water Authority (DEWA) to boost AI and cloud innovation in UAE and foster new services across Digital DEWA's service portfolio.

Group 42's expertise in AI and Cloud Computing enabled Digital DEWA to implement digital and data transformation initiatives and be the world's first digital utility company in implementing autonomous systems for renewable energy, storage, expansion in AI adoption and digital services

Sources: Big Data White Paper (2019), China Academy of Information and Communication Technology (CAICT), Huawei Research

Edge platform & devices

Edge computing involves decentralising data processing power and enabling availability to mobile computing and IoT entities. Data is processed in servers at the network edge, rather than being sent to a central data centre.

Emerging technologies such as virtual and augmented reality, self-driving cars, smart cities and even building-automation systems require fast processing and responses. Edge computing takes the burden of processing off user devices, resulting in greater power efficiency, while also avoiding the to-and-fro processing latency between the server and the user. By keeping data closer to the user, edge computing could also bring privacy and security benefits.

Why does edge computing matter?

Bandwidth

- Companies that embrace cloud for AI applications may experience higher bandwidth than expected
- Edge computing reduces the amount of data transmission time required for computing to the cloud. 5G will enable the connectivity quality required for offloading computing to edge servers.

Latency

- Enables more efficient real-time applications (e.g. facial recognition using a smartphone camera)
- Running the necessary algorithms on a cloud-based service would take longer than running them locally on an edge server or gateway

Privacy and Security

- Storage and processing is performed remotely within the edge node
- Edge computing removes security concerns of centralised cloud data as data is closer to the user

KEY PRIORITIES

Malaysia needs to improve storage & processing capabilities, for domestic and regional consumption.

Establishing national cloud strategy and executing the national AI policy

Malaysia has recently unveiled the Malaysia National Artificial Intelligence Roadmap (A-IRMAP) and is currently developing a national cloud strategy. Most recently, Malaysia has upgraded the Public Service Sector Data Centre (PDSA) into a cloud computing service called MyGovCloud. The Government could similarly encourage industries to adopt cloud and AI solutions. At the same time, there is a need to strengthen areas (e.g. upgrade legacy computing infrastructure to be cloud and AI ready, build Malaysia's industry AI ecosystem, support multiple AI compute technologies) and address governance and security issues (e.g. data sharing, data sovereignty). There is a need to incubate more AI startups and talent via a national AI facility (e.g. AI laboratory in Ministry of Science, Technology and Innovation's (MOSTI) NTIS Sandbox).

Promoting Industry Cloud Platform

The Malaysia Government is required to develop initiative packages that promote the use of cloud platform for the industries to adopt cloud solutions (e.g. TM One Cloud Alpha). This could also enable other emerging technologies (e.g. IoT, AI) to enhance customer experiences, product capabilities and digital innovation. However, advanced use cases of industry cloud platform will require faster connectivity.

Upgrading local data centres

Local data centre companies could partner with key technology providers to enhance capabilities, ensuring sufficient computing power to support industry cloud and AI processing requirements. Data centres need to be built with Tier-3 specifications. Support from the Government to prioritise local cloud players and attract hyperscale cloud players to build and invest infrastructure in Malaysia could further strengthen its ASEAN's Digital Capital positioning.

Terminals & devices

One of the elements that separates digital infrastructure frontrunners from adopter/starters is the adoption of terminal and internet-connected personal devices such as smartphones, personal computers and tablets and Internet of Things (IoT) devices.

Malaysia is approaching maturity in terms of the adoption of personal devices and is increasingly embracing AI technology, which in turn is accelerating the adoption of consumer IoT devices such as smart televisions, smart wearables and connected car applications.

Utility IoT devices (e.g. smart security cameras, smart meters/streetlights) enable near real-time measurements of use and thus improve forecasting capabilities. Such devices are essential for Smart City and other government initiatives.

Industrial IoT devices (e.g. connected sensors, robotics for manufacturing, RFID tracking capabilities) enable various machines and equipment in an industrial setting to be interconnected and monitored, leading to improvements to the efficiency of industrial production and logistics.

IoT devices landscape

The IoT market is rapidly gaining traction primarily due to the rapidly decreasing cost of sensors and other hardware. Projections indicate average annual growth of IoT devices at 28.7% over the period of 2018–2025. The total amount of devices in operation are expected to reach 41.6 billion in 2025. It is also estimated that smart industrial IoT connections will grow fourfold between 2019 and 2025.

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Key IoT use cases leveraging 5G

Industries	Use Cases	Requirements
Automotive	▪ Self-driving cars ▪ Vehicle-to-infrastructure communication ▪ Vehicle infotainment applications	▪ Long-range transmission ▪ High bandwidth ▪ Low latency ▪ Quality of service (QoS)
Industrial manufacturing	▪ Mission-critical factory automation ▪ Remote supervision and control of machines ▪ Manufacturing process automation	▪ Low latency ▪ Long battery life ▪ Quality of service
Healthcare	▪ Remote robotic telesurgery ▪ Remote patient monitoring ▪ Medical treatment aided by augmented reality	▪ Long-range transmission ▪ Low latency ▪ Quality of service
Media and entertainment	▪ Ultra-HD video ▪ Immersive media applications ▪ Augmented Reality (AR)/ Virtual Reality (VR) gaming	▪ High bandwidth ▪ Low latency ▪ Quality of service
Smart cities and utilities	▪ Smart buildings ▪ Smart transportation ▪ Smart meter monitoring	▪ Bandwidth consumption, depending on use case ▪ Long battery life

Malaysia's current IoT landscape

In Malaysia, 4G technology is the main conduit supporting IoT deployments. Moving ahead, 5G deployment will be the critical catalyst for the widespread adoption of AI-enabled IoT. As of 2020, IoT is estimated to have contributed RM9.5 billion to Malaysia's GNI, and that figure is expected to reach RM42.5 billion in 2025.

Malaysia is in a strong position to foster IoT deployments in its domestic market. The country has also formulated multiple national policies and strategies, including the National Fourth Industrial Revolution (4IR) Policy, National Policy on Industry 4.0 (Industry4WRD) (MITI), National IoT Strategic Roadmap (MIMOS) and National IoT Framework (MDEC), all aimed at propelling Malaysia's advancement to Industry 4.0 and widespread adoption of IoT, improving manufacturing labour productivity, providing jobs for skilled workers, and creating opportunities for local entities to manufacture IoT devices domestically for both the consumers and the industry.

IoT deployment opportunities

IoT deployments in Malaysia are forecasted to create technology opportunities such as:

- Applications and services amounting to RM34 billion in 2025, compared to RM7.5 billion for 2020
- Device production worth RM4.3 billion in 2025, compared to RM1.0 billion in 2020

	Global Scenario		Malaysia Scenario	
	2020		2020	2025
Layer 5: Analytics / **Layer 4: Apps & Services**	RM890 billion	Total % of IoT 80%	RM7.5 billion	RM34.0 billion
Layer 3: Computing & Storage	RM61 billion	5%	RM0.5 billion	RM2.1 billion
Layer 2: Communications & Networking	RM58 billion	5%	RM0.5 billion	RM2.1 billion
Layer 1: Things: Hardware, Power & Protocols	RM105 billion	10%	RM1.0 billion	RM4.3 billion

Source: MIMOS "National Internet of Things (IoT) Strategic Roadmap"

KEY PRIORITIES

Malaysia needs to harness the potential of AI-enabled devices to differentiate itself from neighbouring countries.

Promoting adoption of industry IoT

The Government and technology providers could develop a collaborative facility, provide ecosystem support or form partnerships with academia to help SMEs and local players obtain support in skills development, funding and regulation as well as increase their technology awareness. The Malaysian Government could also further scale up its efforts in terms of grants, incentives and programmes to accelerate the adoption of IoT solutions by industries and SMEs.

Malaysia as an AI-enabled IoT capital

The Government could further accelerate Malaysia's local capability to manufacture AI-enabled industrial IoT devices and AI chipsets, as a key sector focus. Additionally, Malaysia could enhance existing standards, incentives, grants and nurture the ecosystem to drive sector growth.

Promoting adoption of consumer IoT

Malaysia could focus on accelerating infrastructure deployment (e.g. high speed broadband or FWA) to drive wider adoption of consumer IoT and lay a solid foundation for the successful deployment of AI enabled IoT solutions.

Improving accessibility of personal devices

The Government could promote and provide incentives to its citizens, especially the underserved population, to start using low cost 4G LTE devices so they can benefit from digital opportunities and facilitate the decommissioning of analogue phones.

Malaysia's Digital Infrastructure places itself well towards the ASEAN Digital Capital objective

In ASEAN, Malaysia's general quality of regional internet infrastructure is satisfactory when compared to the region and also the global average.

Malaysia compared against ASEAN countries

	Singapore	Malaysia	Thailand	Indonesia	Vietnam	Philippines	Brunei	Laos	Cambodia	Myanmar
Aggregate Score	4	3	3	3	2	2	N/A	1	1	1
Harvey Ball										
Global Connectivity Index	4 (2nd)	3 (34th)	2 (46th)	2 (58th)	2 (55th)	2 (59nd)	1 (N/A)	1 (N/A)	1 (N/A)	1 (N/A)
Digital Readiness Index	4 (1st)	3 (38th)	3 (55th)	2 (62nd)	2 (62nd)	2 (73rd)	1 (N/A)	1 (107nd)	1 (102nd)	1 (111th)
Telecommunication Infrastructure Index	4 (19th)	4 (50th)	4 (62nd)	3 (90th)	3 (69th)	3 (97th)	4 (35th)	2 (166th)	3 (103rd)	2 (112th)

Legend: *1 – Exploring* *2 – Doing* *3 – Becoming* *4 – Being*

Sources: Huawei's Global Connectivity Index 2020; Cisco's Global Digital Readiness Index 2019; World Economic Forum's Global Competitiveness Report 2019; Speedtest July 2022

Malaysia needs to accelerate the modernisation of its digital infrastructure to become ASEAN's Digital Capital. Traditional technologies are no longer adequate, and are unable to meet industry needs, e.g. network, platform and intelligence. The next foundation of a modernised digital infrastructure will revolve around three core pillars, i.e. deployment of 5G technology, wide adoption of cloud computing and owning AI capability. Under the National 4IR Policy, Malaysia has identified these technologies as foundational 4IR technologies, alongside advanced material and technologies and blockchain. Strengthening these three pillars will promote full digitalisation of production elements and processes that support the digital transformation of the industry.

Digital Infrastructure build up and future state

The three potential digital infrastructure build-ups are:

- **Innovation Capital:** Leader in emerging technologies research and innovation
- **Data & AI Capital:** Leader in data storage, data processing and AI capabilities
- **Trade capital:** Leader in supply chain solutions for cross-border trade

Innovation Capital

Description

Leader in emerging technologies research and innovation

Key elements

- Technology Park
- Innovation Lab
- Academia R&D

Malaysia's achievements

- National incubator/innovation facility, e.g. National Technology and Innovation Sandbox (NTIS), Huawei Spark programme in collaboration with MDEC, and MDEC's Innovation Exchange programme to link corporates to local tech startups and scale-ups
- Establishment of the Malaysian Research Accelerator for Technology & Innovation (MRANTI)
- Technology park, e.g. Technology Park Malaysia (TPM)
- Malaysia's first Smart City Operating System to be developed in Kuching

Malaysia to develop

- Timely assignment of 5G
- Industrial 5G use cases
- AI incubation ecosystem (SMEs/startups)

CASE STUDY

Peng Cheng Laboratory

Description

- National R&D facility to build open source platform for AI, creating support environment
- To build national-level open source platform for AI, creating an environment to support national AI industry and its development
- AI computing capabilities provided by Huawei

Key Benefits

- Attracts domestic and foreign resources on AI science and technology, enabling extensive R&D
- Allows SMEs and startups to innovate AI solutions
- Enhances the regional leading position and innovation strength of scientific research

Data & AI Capital

Description

Leader in data storage, data processing and AI capabilities

Key elements

- Cloud Platform
- Big Data
- AI Capabilities

Malaysia's achievements

- Open Data platform (Data.gov.my)
- Industry Cloud platform (Cloud Service Provider)
- Formulating the AI Roadmap
- Becoming the location of data centres (such as from Microsoft, Google, and Amazon)

Malaysia to develop

- Businesses to adopt cloud services
- Domestic data demand and creation
- Upgrading and upscaling local data centres

Trade Capital

Description

Leader in Supply Chain solutions for cross-border trade

Key elements

- e-Commerce Platform
- Smart Supply Chain
- Smart Manufacturing

Malaysia's achievements

- e-Commerce platform, e.g. Digital Free Trade Zone
- 3 components: Drive SME Export (business), Movement of Data (border clearance) and Movement of Goods (logistics)

Malaysia to develop

- Nationwide internet coverage
- Industry IoT devices
- National Digital ID

CASE STUDY

EU's EGI Data Hub

A Dutch-based, region-wide service provided by the EU EGI. It enables data to be discoverable and available in an easy way across all EGI federated resources and allows users to make their data available using different levels of access. The key outcomes were:

- Ensures maximum compatibility with existing applications and minimum hassle for developers and users alike
  - Data hosted on the EGI DataHub can be readily accessible via cloud
  - Full integration with EGI Federated Cloud and High-Throughput compute resources
- Increases regional traffic of data, positioning Amsterdam (base country) as a regional data hub

CASE STUDY

Digital Trade Hub of Azerbaijan

A public platform was developed by the Government to contribute growth in foreign trade and SMEs. It was built based on a 'single window concept' as a platform and enabled initiatives such as e-Residency, e-Signature, e-Business registry, e-Payment, e-Export and e-Documents. The key outcomes were:

- Operates as a single digital point for trade and investment, connects local businesses with foreign customers and capital investors
- Provides a market searchable export directory to match businesses over the world (Digital ID)
  - E.g. product line, product mix, quality of products, stockpile volumes, etc.
- Ensures information authenticity of local manufacturers

Policies and investment models are enablers to accelerate and grow Malaysia's Digital Infrastructure

A future-proof digital infrastructure foundation is highly dependent on clear regulations, policies and quality and sustainable investments. Private sector involvement matters can be leveraged by adopting investment models such as Public-Private Partnerships facilitated by those policies and national aspirations as outlined in JENDELA.

Build scalable and future-proof infrastructure to accelerate strategic priorities

Malaysia could leverage and differentiate its digital infrastructure from other ASEAN countries via policy and investment models across all key opportunity areas. The three key opportunities for Malaysia are:

1. Acceleration of 5G spectrum deployment
2. Widen connectivity via Fiber/FWA and increase international internet connectivity
3. Foster adoption of emerging technologies such as cloud, IoT and AI.

The summary is as per the diagram below following with the digital infrastructure development framework:

Legend: Δ Regulations and Policies ◊ Investment

Future state of Digital Infrastructure

Innovation Capital
Leader in emerging technologies research and innovation

Data & AI Capital
Leader in data storage, data processing and AI capabilities

Trade Capital
Leader in supply chain solutions for cross-border trade

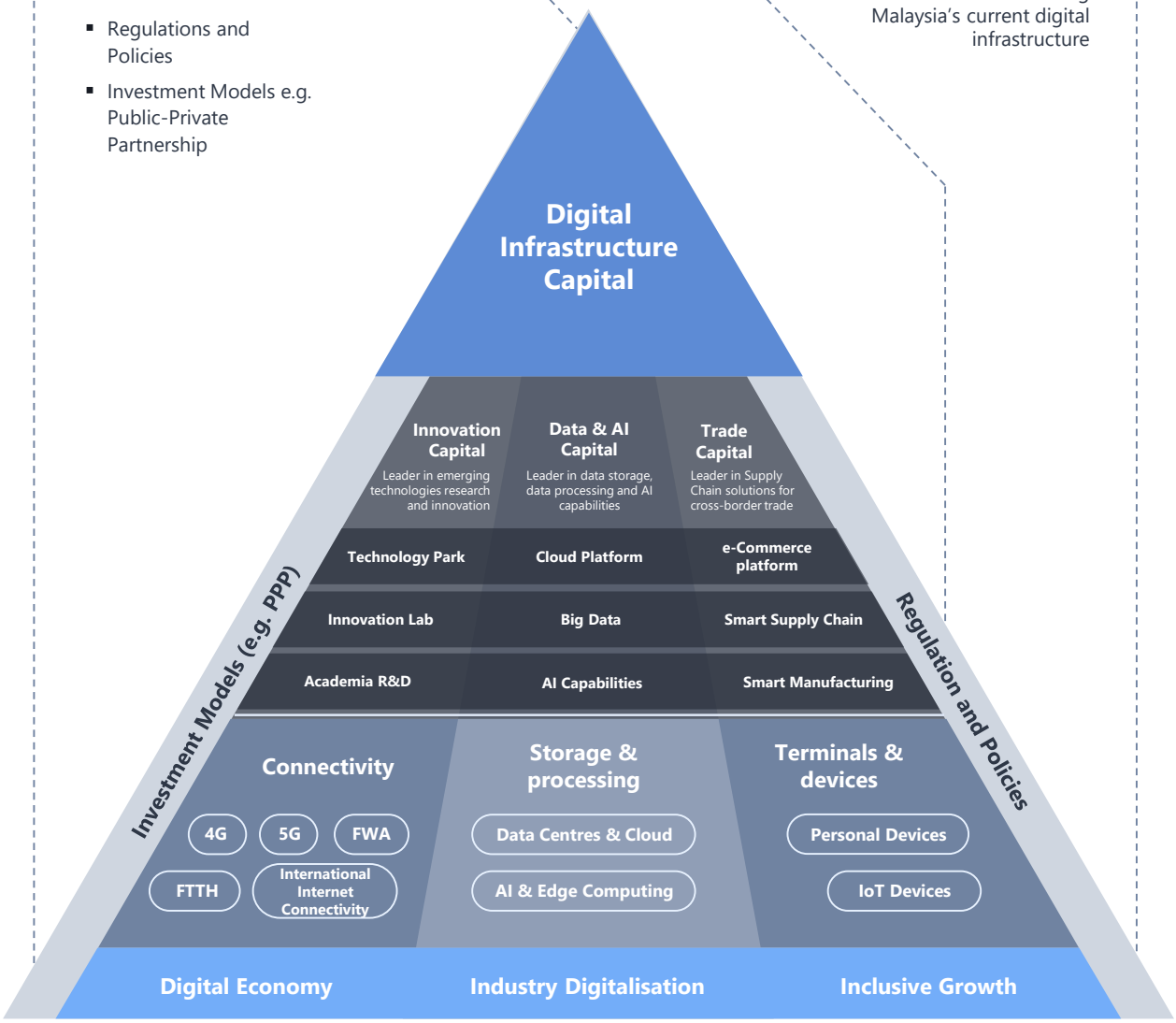
5G, Cloud and AI; foundation of modernised digital infrastructure

Core Digital Infrastructure
- One integrated system
- Contains three components; work interactively
- Key foundation and enabler for the 21st century economy

Enablers
Key requirements to further grow Malaysia's digital infrastructure

- Regulations and Policies
- Investment Models e.g. Public-Private Partnership

Demand Drivers
Key Significant socio-economic potential from further elevating Malaysia's current digital infrastructure



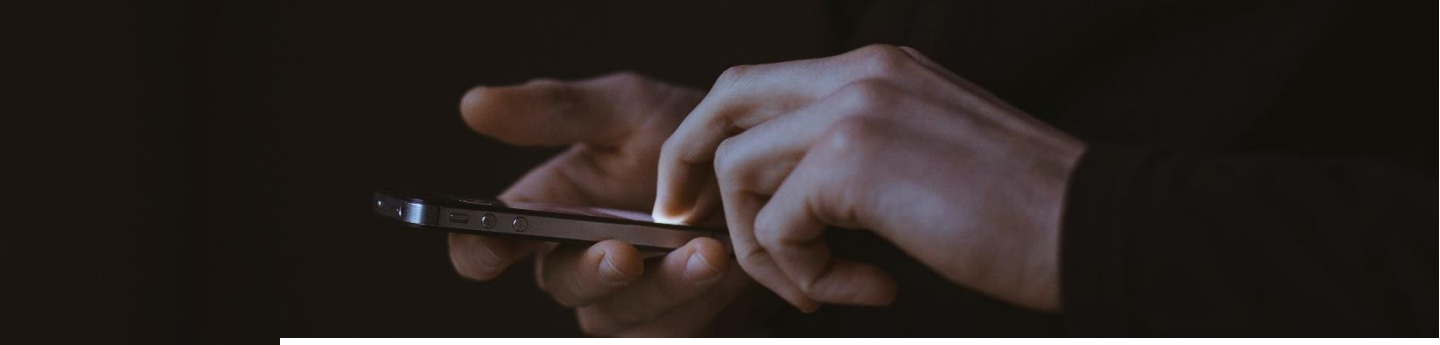
CHAPTER 4

Digital Security as an enabler to create trust

Chapter Overview:

This chapter covers:

- Malaysia's current Digital Security landscape in the areas of Governance, Policies and Regulations, Innovation and Capacity Building as well as Emerging Technologies
- Key opportunities to advance, namely Forward-looking Policies, Culture of Security, High Digital Security Innovation and Capacity as well as Blockchain Innovation



CHAPTER 4

Digital Security as an enabler to create trust

NACSA is committed to continue improving our national cyber security governance for a more coordinated and collaborative approach towards a better and trusted cyber ecosystem.

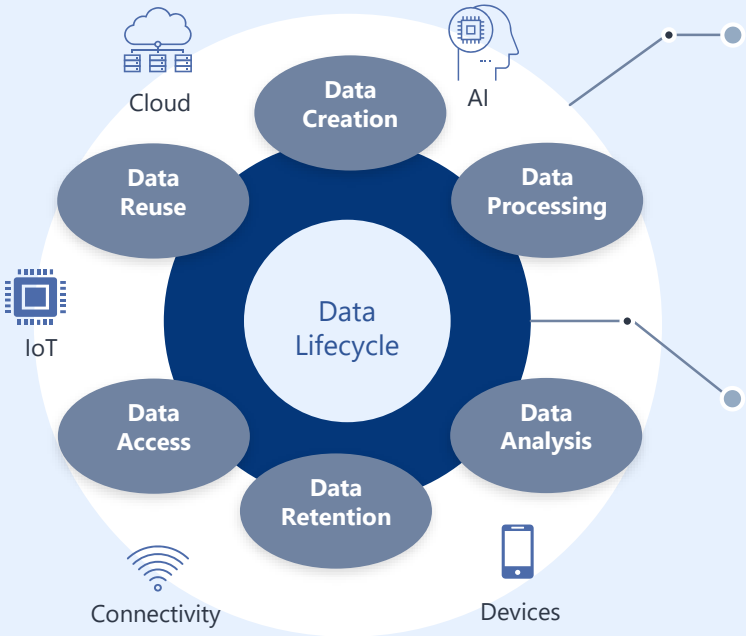
Rahamzan bin Hashim
Chief Executive of NACSA Malaysia

Digital Security creates a secure environment to operate digitally and drive innovation

Digital technology is fast becoming an important part of our daily lives and we are increasingly digitally connected. As we embrace the benefits of digital technology, it also at the same time creates vulnerabilities and exposes us to digital threats. Hence, digital security becomes increasingly important for creating trust in the systems, businesses, and data that enables confidence in transformation and innovation. It optimises digital risks for both human and cyber protection; ensures policies, governance and risk management measures are in place to facilitate more complex transactions digitally and drives innovation in a secured environment.

Creating trust and confidence in the ecosystem, enabling complex transactions and innovation by securing the infrastructure through strengthening policies, governance and technological solutions

Emerging technologies are transforming the need for digital security and the role it plays. These technologies are associated with new and more complex risks that expose us to the possibility of attacks and breaches, that could lead to the erosion of trust. Technological growth has been accompanied by a data explosion, as data is needed to enhance the efficiency of operations and enrich the experience of service delivery. The acceleration of technology and global data flows have made digital security a major priority among those responsible for managing and securing digital infrastructure, at every point of the data lifecycle, covering cybersecurity protection and privacy protection.



Cybersecurity Protection

Cybersecurity protects infrastructure, networks and organisational systems against cyberattacks and cyber criminals. It involves a wide range of aspects beyond regulatory and legal considerations. It also covers technical as well as operational aspects.

Privacy Protection

Privacy protection deals with the handling of data consent, sensitivity and the right to collect, use, store and share data. Data privacy is protected under Acts and regulations.

Systems should be built on standards by which they can be verified and can be operationalised with the right policies. The responsibilities do not rest on a single owner, every party has a role to play.

Digital security responsibilities of government, organisations and the general public:

Government

Government bodies are tasked with national cybersecurity strategies, policies and governance implementation, as well as building the security infrastructure for Malaysia.

Organisations

Security awareness and the adoption of certain baseline security infrastructure should be maintained within organisations to operate and innovate in the more complex digital environment.

General Public

People must embrace the culture of security, with high security awareness, as well as putting in efforts to be equipped with basic knowledge to protect themselves and to drive talent capacity.

Security governance, cooperation and policies in Malaysia

Malaysia has multiple governance and developmental agencies to oversee and govern national digital security matters in different areas:

National Cyber Security Agency (NACSA)

- Officially established in Feb 2017 to lead and oversee national cybersecurity related matters
- Tasked with developing and implementing national-level cybersecurity policies and strategies

CyberSecurity Malaysia

- National cybersecurity specialist and technical agency that provides cybersecurity services and talent development
- Tasked with strengthening Malaysia's cybersecurity resilience

Malaysia Digital Economy Corporation (MDEC)

- An agency under the Ministry of Communications and Multimedia that oversees the development of the digital industry, including innovation, adoption of cybersecurity practices as well as capacity and capability development.

National Cyber Coordination and Command Centre (NC4)

- Established as a centre for dealing with cyber threats and crises at national level
- Ensures coordination and cooperation between CNII agencies

Department of Personal Data Protection (PDP)

- A department under the Ministry of Communications and Multimedia that regulates and enforce Personal Data Protection Act (PDPA)

Cybercrime is a global issue that transcends national borders. Mutual cooperation and the participation of international actors are vital to enable effective collaboration in digital security and governance. Malaysia is an active player in international networks, entering into and participating in bilateral and multilateral agreements on global digital security cooperation, cybersecurity capabilities, information sharing and threat response. Malaysia's alliances with the international community and other economies have helped maintain its strong cybersecurity position in international rankings, such as the Global Cybersecurity Index by the International Telecoms Union.

Bilateral and multilateral Agreements

- Trilateral Meeting on Security, Indonesia-Malaysia-Philippines Agreement on spread of terrorism-related content in cyberspace
- Memorandum of Understanding, Malaysia-Philippines information exchange on current threats and strategies to increase cybersecurity effectiveness
- Memorandum of Agreement, Malaysia-South Korea Agreement to exchange, develop and consolidate knowledge and experience in dealing with cybersecurity incidents
- Memorandum of Understanding, India-Malaysia Cybersecurity cooperation

Cooperation

Asia-Pacific Computer Emergency Response Team (APCERT)

Tasked with creating a secure and reliable cyberspace in Asia-Pacific region

Organisation of the Islamic Cooperation Computer Emergency Response Team (OIC-CERT)

Tasked with developing cybersecurity capabilities to mitigate cyber threats by leveraging collaboration between Islamic countries. Most recent workshop is the 5G Security Framework Workshop in February 2022.

Forum of Incident Response and Security Teams (FIRST)

Brings together the security and incident response network including experts from government, commercial and academic sectors

Sources: NACSA; CyberSecurity Malaysia; MDEC; NC4; UNIDIR; APCERT; OIC-CERT; FIRST

Malaysia has established policies for both cybersecurity protection as well as data privacy protection in managing digital security risks.

Cybersecurity Protection

NACSA recently launched an updated national policy for cybersecurity, the Malaysia Cyber Security Strategy (MCSS) 2020–2024, which will supersede the National Cyber Security Policy (NCSP). The policy aims to provide a holistic coverage of Malaysia's cybersecurity direction across five pillars with 12 strategies aligned with leading global best practices. The MCSS takes a forward-thinking approach to emerging threats.

Malaysia Cyber Security Strategy (MCSS) 2020–2024

With the Vision of "Malaysia cyberspace is secured, trusted and resilient, fostering economic prosperity and citizens' wellbeing", MCSS 2020–2024 focuses on five strategic pillars:

1. Effective Governance and Management
    - Enhancing national cybersecurity governance and ecosystem
    - Improving organisation management and business operations
    - Strengthening cybersecurity incident management and active cyber defence
2. Strengthening Legislative Framework and Enforcement
    - Enhancing Malaysia's cyber laws in addressing current and emerging threats
    - Enhancing the capacity and capability of cybercrime enforcement
3. Catalysing World Class Innovation, Technology, R&D and Industry
    - Spurring the national cybersecurity R&D programme
    - Promoting a competitive local industry and technology
4. Enhancing Capacity and Capabilities Building, Awareness and Education
    - Enhancing national cybersecurity capacity and capability building
    - Enhancing cybersecurity awareness
    - Nourishing cybersecurity knowledge through education
5. Strengthening Global Collaboration
    - Strengthening international collaboration and cooperation in cybersecurity affairs
    - Demonstrating Malaysia's commitment in promoting a secure, stable and peaceful cyberspace to uphold international security

CyberSecurity Malaysia has introduced guidelines for digital areas such as Secure Industrial Control Systems (ICS), Secure Software Development Lifecycle (SSDLC), Secure Internet of Things (IoT) and Industry 4.0 to provide security practice for specific technologies and ways to combat cyber threats. The Security Commission Malaysia also introduced guidelines on the management of cyber risks for businesses involved in the trade of digital assets or cryptocurrency.

Privacy Protection

Malaysia's Personal Data Protection Act (PDPA) 2010 offers comprehensive data privacy and protection laws with respect to commercial transactions for personal data, as well as providing clear legal guidelines on personal data protection. Amendments to the PDPA have been proposed to ensure that the Act keeps pace with the latest trends in data and transactions and reflects the development of data protection legislation globally. The proposed amendments are expected to be tabled in Parliament in October 2022. Some of the amendments include requiring data users to appoint a data protection officer and allowing the transfer of personal data between data users at the request of the owner.

The Government is also working on developing the National Data Sharing Policy (NDSP). The policy will provide clarity on the sharing of data, encouraging greater collaboration and sharing of data or information among the public sector, private sector and academia, as well as complementing cross-border data transfer mechanisms.

Malaysia's efforts in security innovation and talent capacity

Malaysia has made great efforts to foster security innovation and talent to realise the tremendous potential of the digital economy.

Digital Security innovation

Malaysia has a sizeable number of leading security solutions and services providers in the ASEAN region. They are well-positioned to scale up and expand regionally and internationally. The Government has also made efforts to encourage innovation in the cybersecurity industry and facilitate cybersecurity industry development, with programmes such as Cyber Innovation Challenge (Cyber100).

Cyber100 Programme

The objective of this programme is to drive and facilitate innovation of cybersecurity solutions, encouraging companies to pilot their solutions with support through platforms, incentives and collaboration with universities. The programme aims to produce 100 local companies within five years (2020–2024) that are capable of creating solutions to address the growing cybersecurity threats facing Malaysia.

Malaysia has a number of homegrown security solution providers that have successfully expanded their footprint to the regional and global markets, representing Malaysia's digital security capabilities and innovation.

LGMS is one of the leading cybersecurity penetration testing companies in the Asia-Pacific region. In the 2019 IDC Report, it was named as one of the key penetration testing vendors for IoT. LGMS delivers world-class professional services to clients in Malaysia and around the world, across a range of different industries. It is a joint-venture party to the TÜV AUSTRIA Cybersecurity Lab, with TÜV TRUST IT, a member of the TÜV AUSTRIA Group. The Cybersecurity Lab will offer cybersecurity testing and certification to the Asia-Pacific region, realising Malaysia's potential as the Asia-Pacific cybersecurity hub.

Securemetric is one of the leading digital security players in ASEAN, offering security solutions with a strong footprint across ASEAN and has local establishments in Singapore, Indonesia, Vietnam and Philippines. They are part of MDEC's Global Acceleration and Innovation Network (GAIN) Programme, which catalyses the expansion of Malaysia tech companies to become global players and local champions.

e-Lock focuses on developing IT security solutions that are practical and highly reliable. e-Lock has expanded its services from data integrity protection to multi-factor authentication for internet banking and beyond. It serves more than 800 organisations across Asia, in countries including Japan, China and Thailand.

Sources: MDEC; LGMS; Securemetric; e-Lock

Digital Security capacity

To boost the digital security talent capacity in Malaysia, various government entities have partnered with the private sector to promote and create awareness in digital security.

General Public

To create awareness of digital security and educate the public with cybersecurity knowledge

CyberSAFE

CyberSAFE provides necessary information and resources tailored to audience categories such as kids, youth and adults to educate and enhance public awareness on cyber safety. It also provides a helpline that people can call to report or escalate digital security incidents.

Higher Education

To promote cybersecurity as a career, prepare students and graduates to be industry ready and drive talent pipeline

NxFORCE

MDEC partnered with International System Audit and Control Association (ISACA) and Institutions of Higher Learning (IHLs) to provide access to globally recognised certification, hands-on labs and career mentorship for tertiary education students, ensuring that these students are ready to work in the cybersecurity sector when they graduate.

Workforce

To upskill or retrain cybersecurity workforce and retain cybersecurity talent

Upskill Programme

In 2018, MDEC collaborated with Protection Group International (PGI) UK and Asia-Pacific University of Technology and Innovation (APU) to train cybersecurity professionals with relevant skills and knowledge. In 2020, cybersecurity professionals were offered upskilling opportunities in the cloud security domain.

CyberSecurity Malaysia Collaboration Programme (CCP)

The CyberSecurity Malaysia Collaboration Programme (CCP) serves as a strategic networking platform to spur collaboration among local cybersecurity companies and government entities to strengthen the digital security workforce development as well as increase industry's contributions to national economic development.

CSM-ACE

Cyber Security Malaysia - Awards, Conference and Exhibition (CSM-ACE) is a public-private partnership driven knowledge sharing platform, gathering industry experts and community to discuss the latest cybersecurity trends and to inculcate cybersecurity culture at the national level.

Sources: CyberSecurity Malaysia; MDEC

National Digital ID to enable complex transactions digitally

Malaysian Communications and Multimedia Commission (MCMC) is developing the National Digital ID (NDID) with the aim to ensure complex digital transactions are seamless, authentication-secured, and that transactions are efficient and authentic.

NDID

National Digital ID

Safe • Secure • Protected

NDID aims to supplement the existing MyKad in providing a bridge for online verification and a more unified digital experience. It acts as the key enabler for improving digital adoption and enhancing Malaysia's global competitiveness. NDID will open up the opportunity for Malaysia to create a digital information ecosystem through a verifiable and secure platform of trust. It adds value to the digital economy across various sectors including public services, financial services, e-Health, e-Commerce, e-Payment/e-Wallet, education, etc. As an all-in-one access pass equipped with important biometric data, NDID will bring cost saving benefits through process improvements, along with increased digital adoption due to convenience and improve transaction efficiency. The NDID is expected to be implemented by 2025. The three principal benefits of NDID are described below:

Convenient omni-channel access

It can be used to securely conduct transactions and access public services anytime, anywhere, for a better experience.

Strong security and trust across multiple platforms

It simplifies the authentication process to enable frictionless transactions and access to public services, enabling more complex transactions digitally

Contactless transactions

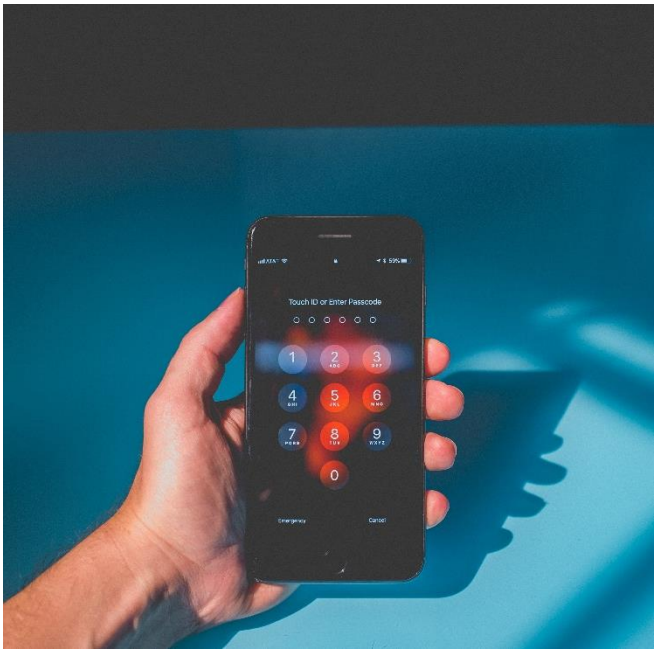
It enables contactless transactions and identity authentication with a high level of assurance. Such capabilities are increasingly required due to the COVID-19 pandemic.

CASE STUDY

AADHAAR

India's National ID

India's Aadhaar system enables service providers to conduct complex transactions digitally. Agents equipped with point-of-sale devices are able to conduct customer due diligence and satisfy the regulations to open bank accounts almost instantaneously by using just the Aadhaar number and secured authentication factor (e.g. through fingerprint authentication or One Time Password by SMS).



Sources: MCMC; World Bank Blog

Blockchain as an emerging secure technology

Blockchain technology is a shared and immutable ledger for recording transactions and tracking assets, which is capable of supporting multiple industries such as public service delivery, finance, healthcare, supply chain and manufacturing. It brings significant benefits including improved traceability, enhanced security and increased efficiency by removing intermediaries. Its versatility and decentralised nature have gained it significant attention in ASEAN. In 2021, MOSTI launched the National Blockchain Roadmap 2021–2025, with the aim of strengthening Malaysia's leadership in blockchain for economy competitiveness and growth, as well as enhancing digital security.

Blockchain development in Malaysia

Regulations for Digital Assets Exchanges (DAX)
Securities Commission Malaysia has set up requirements for DAX operators on digital capital exchange and introduced the Capital Markets and Services Order 2019.

National Technology and Innovation Sandbox (NTIS) blockchain focus
NTIS act as a national solution coordination and facilitation centre to accelerate the development of innovative solutions from R&D to commercialisation for focused technologies including blockchain.

e-Scroll System for education certificate authentication
The Malaysian Ministry of Higher Education and six public universities have formed a consortium to create an e-Scroll system to authenticate the validity of the education certifications.

Blockchain Hackathon for the energy industry
Tenaga National Berhad is exploring the use of blockchain to improve data transparency, accuracy and security for the energy industry.

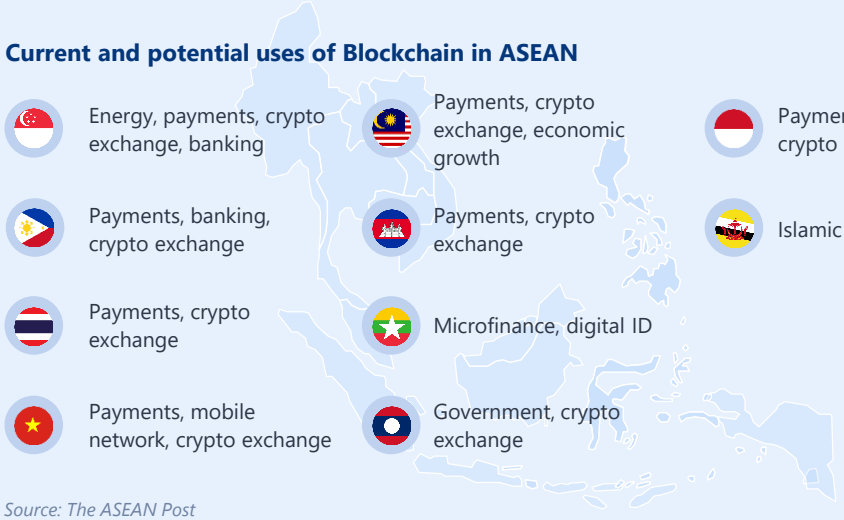
NEM Blockchain Centre
In July 2018, the NEM Blockchain Centre was set up in Malaysia to nurture blockchain talent and provide incubator and accelerator programmes for blockchain related startups.

Shariah-compliant blockchain FinTech app
The world's first Shariah-compliant mobile application for trading physical gold using GOLDX, a gold-backed cryptocurrency based on blockchain technology.

Sources: Securities Commission Malaysia; NTIS; NST; Digital News Asia; Enterprise IT News

REGIONAL CASE STUDY

Current and potential uses of Blockchain in ASEAN



Source: The ASEAN Post

ASEAN's Digital Security landscape

Malaysia ranked 5th in the Global Cybersecurity Index 2020, second in the ASEAN region after Singapore. The country has strong governance leadership, capacity-building programmes, and encourages development of cybersecurity solution providers. Malaysia needs to continuously ensure it remains a top leader in the region in digital security.

Country	Singapore	Malaysia	Indonesia	Vietnam	Thailand	Philippines	Brunei	Myanmar	Laos	Cambodia
Global Cybersecurity Index Ranking	4th 98.52	5th 98.06	24th 94.88	25th 94.59	35th 86.50	61st 77.00	85th 56.07	99th 36.41	131st 20.34	132nd 19.12
Harvey Ball										
Legal Measures	4	4	4	4	4	4	3	2	3	1
Technical Measures	4	4	4	3	3	3	3	1	1	1
Organisational Measures	4	4	3	4	4	2	2	1	1	1
Capacity Development	4	4	4	4	3	3	2	2	1	1
Cooperative Measures	4	4	4	4	3	4	1	2	1	1

Legend: *1 – Exploring* *2 – Doing* *3 – Becoming* *4 – Being*

Sources: ITU Global Cybersecurity Index 2020

Digital Security legislation in ASEAN

Digital security strategies and policies covering cybersecurity protection and privacy protection vary widely across the ASEAN region. The regional preparedness is still in its infancy, and ASEAN lacks an overarching unifying security policy. In this respect, ASEAN has reaffirmed the importance of regional security governance and is collaborating to establish ASEAN-wide frameworks and guidelines on digital data governance to enable cross-border data flow between the participating ASEAN countries.

	Cybersecurity Protection	Privacy Protection
	National Cybersecurity Strategy (2016)	Personal Data Protection Act 2012
	Malaysia Cybersecurity Strategy 2020–2024	Personal Data Protection Act 2010 (Currently being amended) National Data Sharing Policy (NDSP)
	National Cybersecurity Strategy	Personal Data Protection Act, B.E. 2562
	National Cybersecurity Plan 2022	Data localisation: Regulation No. 82: Information and Electronic Transaction Law
	No specific security laws and strategy Refer to Article 28(g) of the 1945 Constitution	Data localisation: Regulation No. 82: Information and Electronic Transaction Law
	Law on Cybersecurity	Data localisation: Decree of Information Technology Services
Rest of ASEAN	Security laws and strategy are largely absent	No specific data protection/data localisation legislation

Sources: Various government portals; Kearney "Cybersecurity in ASEAN: An Urgent Call to Action"; GSMA "Operationalising the ASEAN Framework on Digital Data Governance"

Key opportunities to become the ASEAN Digital Capital

Malaysia needs to leverage on its key competitiveness and advantages and continuously innovate to maintain its leadership position in digital security. It will require proactive responses to the growing threats posed by emerging technologies and the challenges posed by rapid digitalisation, accelerated by the COVID-19 pandemic. There are four key areas of opportunity which Malaysia can focus on to strengthen its position and better realise its potential to be a leader in digital security.

1

Policy Needs to Evolve to Meet Growing Threats

Policies relating to data sharing, cross-border data flow and data sovereignty must be kept up to date. In order to confront emerging cyber threats, these areas should be a high priority in the national policy agenda.

2

Innovation and Capacity Building Effectiveness

An innovation and solution ecosystem should be built. Cybersecurity skills and knowledge capabilities will be crucial to enhance the effectiveness of capacity building efforts.

3

Awareness and a Culture of Security

Malaysia needs to raise awareness of digital security, in terms of both cybersecurity and data protection for both consumers and businesses. The goal should be to create a culture of security.

4

Blockchain Innovation and Solutions

To build a secure and efficient cyberspace and serve as a leader in the region, Malaysia must continue to improve its technological capabilities through innovation in advanced technological domains.

Flexible, competitive yet secure forward-looking policies

Malaysia needs to continuously attract investors and industry players to promote technological development in cyber security. It needs to foster trust, facilitate complex digital transactions, and create a conductive investment climate in which enterprises can innovate. Conducive, flexible yet secure forward-looking policies are vital.

There are three broad aspects of data to consider in developing a conducive policy for **data sovereignty, data sharing, and cross-border data flow**, addressing:

1. **Data disclosure:** The level of data disclosure should provide flexibility of data usage and promote innovation
2. **Data governance:** The right level of data governance should provide clarity on data classification and balance data sensitivity and flexibility
3. **Data security:** Stringent security enforcement to ensure data privacy protection

KEY PRIORITIES

Data sovereignty

As the Digital Capital of ASEAN, businesses in Malaysia will be operating across its national borders, and cross-border data flow is inevitable. Citizens and governments in many countries are increasingly concerned about data sovereignty and the risk of data leakage. With that, data sovereignty is an important next step to create data security for Malaysian data as well as foreign data flow into Malaysia, with the flexibility for Malaysia to store foreign data in a secured manner.

Data sovereignty has not traditionally been a major focus of cloud strategies in both the public and private sectors. However, it will become more significant as the regulatory landscape becomes more complex. It is recommended that the scope of data sovereignty should include i) establishing laws or standards for the way data should be treated; ii) increasing mechanisms for international collaborations that neglect domestic data security practices; iii) enforcing compliance measures through a structured ecosystem; and iv) ensuring cloud storage systems are used.

Data localisation to strengthen protection of Malaysian data

An important element of data sovereignty is data localisation. Data localisation brings various benefits, in terms of both strengthening data security and also contributing to the local economy.

Key benefits of data localisation:

- Ensures data privacy and security with regulations on data protection within the country
- Prevents unregulated and arbitrary use of personal data
- Promotes the usage of local data centres which will drive innovation and create job opportunities
- Safeguards homegrown ventures with local resources

India's Personal Data Protection Bill (2018)

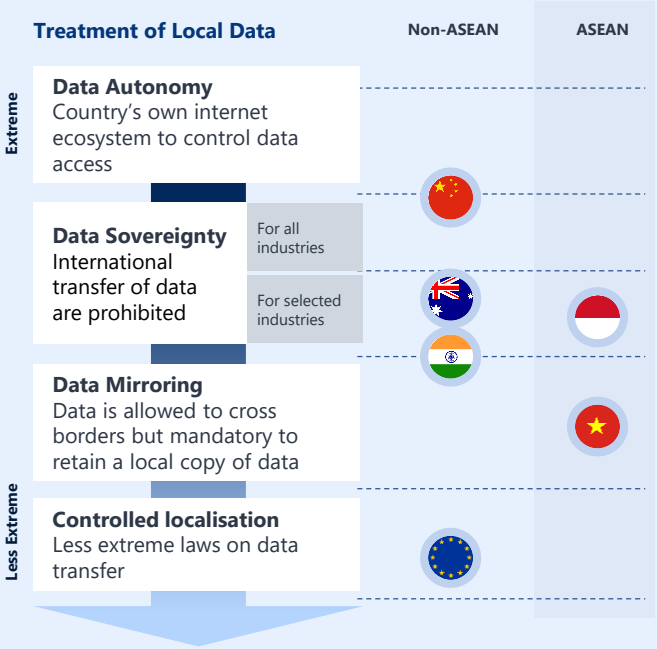
India's Personal Data Protection Bill (2018) has identified regulations on data localisation to protect data security while safeguarding India's homegrown ventures and startup ecosystem.

Source: The Economic Times

However, a blanket approach to data localisation will limit the potential for businesses to harness the full potential of digital technologies. There are different levels of treatment for local data. For example, China applies an unconditional mandate to localise all data and critical information across sectors including public communication and information services, transportation, energy, finance, public services and governance. On the other hand, the European Union allows conditional transfer of personal data to countries with 'adequate' level of data protection. Malaysia needs to consider a balance between driving data security to create trust and confidence and the competitiveness for businesses to invest and operate, and to look at specific areas to impose data localisation, e.g. government and government-linked data.

CASE STUDY

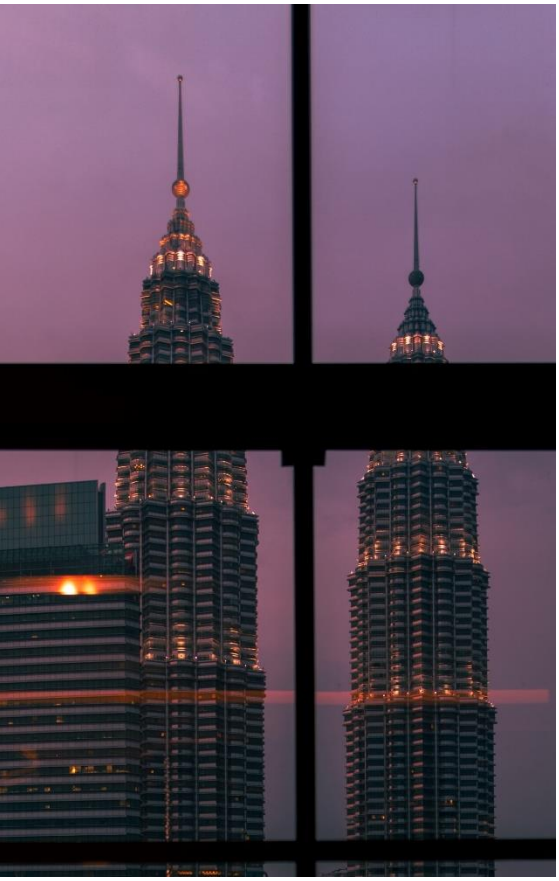
Treatment of local data and sovereignty policy for selected countries



Data Localisation Mandate for Each Country

Country	Strength of mandate	Type of mandate	Type of data to mandate
China	Unconditional	Production, Local storage, local processing	All data
Australia	Unconditional	Local storage, processing	Sensitive personal health data
India	Unconditional	Local storage	Payment data, e-Commerce, social media, health care
European Union	Conditional	Conditional storage	All personal data
Indonesia	Unconditional	Local storage	Provision of public services
Vietnam	Unconditional	Local storage	All Vietnamese citizens data

Sources: Delta Partners Group "Data localisation: from information protection to balkanisation of the Internet"; The Centre for Internet and Society "The Localisation Gambit"



Data sovereignty to create a secured avenue for foreign data

To be ASEAN's Digital Capital, Malaysia will need to attract foreign companies to operate in Malaysia and to serve the ASEAN region and the global market. There will be increasing foreign data flow, creating a need for Malaysia to ensure that there is flexibility for foreign companies to store their data in Malaysia

General Data Protection Regulation (GDPR)

European Union's GDPR ensures a secured environment for data storage and data flow between countries in the region but applies stringent policy when data is transferred outside EU. It gives individuals control over their personal data and to simplify the regulatory environment by unifying the regulations within the EU.

California Consumer Privacy Act (CCPA)

California Consumer Privacy Act (CCPA) provides flexibility for businesses to collect consumers' data while imposing clear regulations on personal data and consumers' control of their own data

Source: GDPR; State of California Department of Justice; KORONA

> *Countries adopting policies that take a blanket approach requiring the localisation of data within national borders are limiting the potential for their own firms to harness digital technologies…*
>
> The Digital Economy in Southeast Asia
> *World Bank*

Data sharing

Data sharing allows collaboration among government departments and the private sector to drive more data-driven decision making that can enhance the efficiency of government service delivery and improve policy development, as well as fostering innovation. A data sharing policy should provide clearly defined rules on data sensitivity and shareability for each data class and require that data security is maintained at the highest level of integrity. Malaysia is in the process of formulating its own National Data Sharing Policy.

Trusted Data Sharing Framework

Singapore's Trusted Data Sharing Framework provides guidance on data sharing to industries and organisations

Data Sharing and Release Act

Australia established a Data Sharing and Release Act to promote data sharing across public services to better realise the benefits of data

Source: IMDA Singapore; Department of the Prime Minister and Cabinet Australia

Cross-border data flow

Cross-border transactions and data flows give businesses access to markets beyond their home countries, and maximise the economic and social benefits of data-reliant technology such as artificial intelligence (AI) and blockchain. This will however, require stringent data security within the ASEAN region as it involves data of the respective countries and the region. There is a need for cross-border data regulation to provide clarity to all stakeholders and stimulate data flow with strict privacy protection between countries in the region. In 2021, ASEAN published a Data Management Framework for data governance and protection throughout the data lifecycle, in the hope of establishing a common framework to facilitate cross border data flow. Malaysia can use this and other similar policies as springboards to advance its aspirations in becoming ASEAN's Digital Capital.

General Data Protection Regulation (GDPR)

GDPR regulates data processing, protection and privacy in the European Union (EU) region. It applies a stringent data regime when data is transferred outside EU territory. Cross-border transfers of personal data are prohibited except to countries that ensure "Adequate Jurisdiction". Currently this includes Andorra, Argentina, Canada, Switzerland, New Zealand and Uruguay.

Source: GDPR

High Digital Security innovation and capacity

The digital security talent shortage is a global issue and has impacted countries and organisations around the world. Given the rapid growth in emerging technologies and the borderless nature of cyberspace, the risks of cyber threats are increasing. The (ISC)2 Cybersecurity Workforce study 2020 cited a 1.42 million gap in cybersecurity professionals in the Asia-Pacific region with growing digital infrastructure.

Malaysia has identified the talent shortage issues and has made efforts to build up the cybersecurity talent base to accommodate the large demand in the market. However, there is a need to increase the effectiveness of developing talent capacity as well as promoting security innovation to keep up with the latest digital trends and to achieve high digital security innovation and capacity. This contributes towards having more digital security solutions and services to serve the local market as well as the region. So far, the Malaysia Digital Economy Blueprint aspires to develop at least 20,000 cybersecurity knowledge workers by 2025, include cybersecurity experts among civil servants, encourage cybersecurity among businesses, have at least 70% of companies adopt cybersecurity measures by 2025, and reinforce cybersecurity outreach to all levels of society.

KEY PRIORITIES

Innovation

Research and development

Support advanced R&D to foster cybersecurity improvement

Startup ecosystem

Attract and incubate local startups and champions to innovate cybersecurity solutions

Note: R&D and startup innovation ecosystem will be further discussed in the Digital Ecosystem Chapter

Talent Capacity

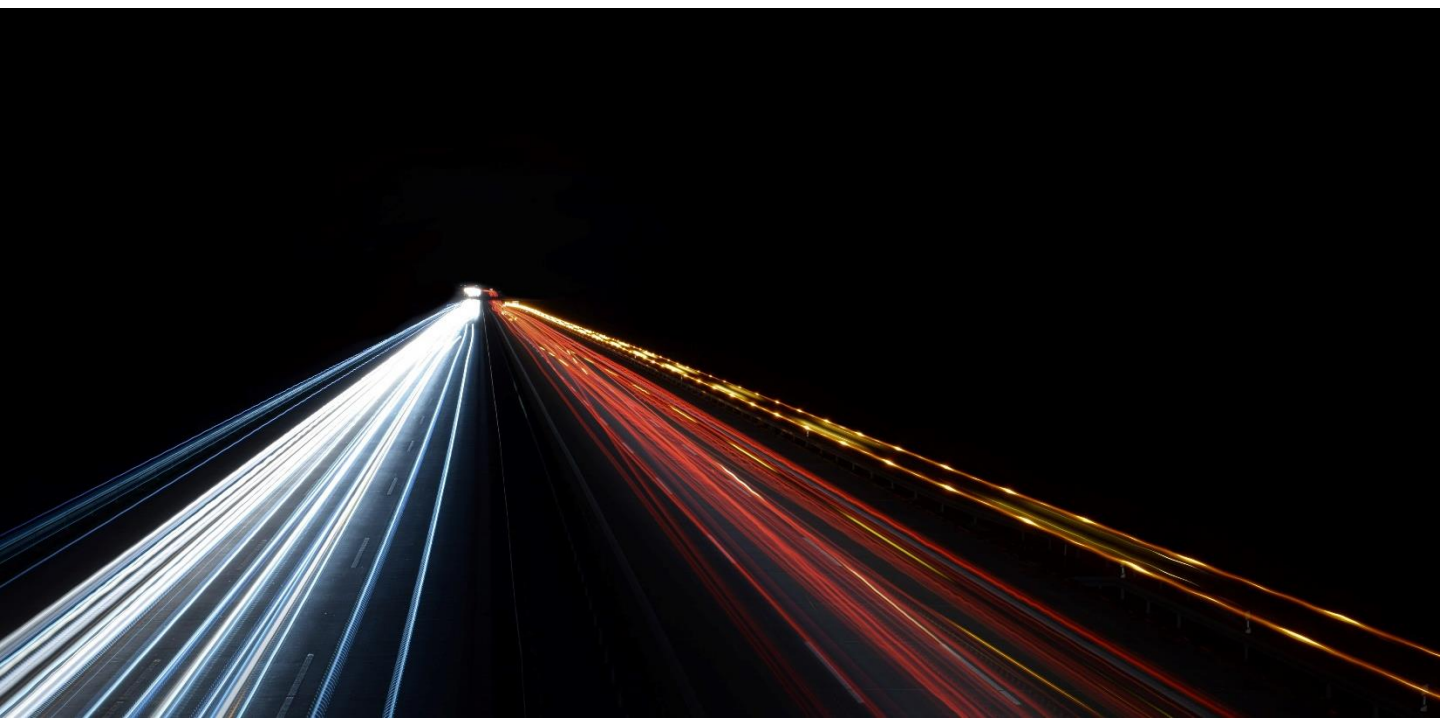
Cybersecurity skills framework

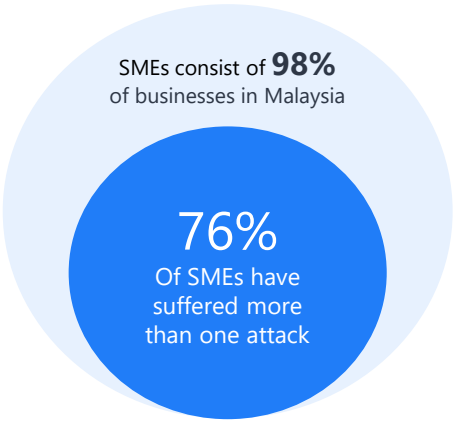
Create a career framework to provide visibility of career prospects to strengthen retention

Interest development

Provide opportunities for the young generation to learn about cybersecurity

Note: Cybersecurity Skills Framework and interest development will be further discussed in the Digital Talent Chapter.





Culture of Security with an ever-evolving mindset

Culture and awareness of digital security is relatively nascent in Malaysia, among both consumers as well as businesses, especially SMEs. A study by Chubb Insurance shows that 84% of SMEs are victims of cyber incidents. Malaysia experiences a high risk of cyberattacks with 50% incidence and 52.9% incidence in data fraud or theft. Malaysia also registered a 31.4% incidence in misuse of technology, based on Global Risk Report 2019 by the World Economic Forum.

Malaysia needs to raise awareness especially among SMEs and consumers and increase confidence in digital adaptation

.

The Malaysian Government is planning to develop and implement the National Cyber Security Awareness Master Plan. Efforts to accelerate digital security awareness and adoption for both consumers and businesses are essential to develop the culture of security.

KEY PRIORITIES

CONSUMERS

- Awareness campaigns to provide guidance and information on digital security
- Digital security education as mandatory in school/universities
- Increase the visibility and awareness of digital security initiative implemented in Malaysia

BUSINESSES (especially SMEs)

- Improve baseline digital security infrastructure
- Approach innovation through lens of security, integrity and resilience
- Develop integrated risk management, compliance and security protocols in digital adoption planning

MATRIX Programme

A collaboration programme between MDEC, SMECorp and NACSA, MATRIX aims to increase SME adoption of cybersecurity by removing adoption challenges such as lack of budget, resources and expertise.

It offers two value propositions: Simple and Smarter:

- Simple – easy to adopt and cost effective with minimum supervision
- Smarter – visibility by staying ahead of cyber threats and scalable with SME business growth

The solutions currently focus on Prevention, Protection and Assessment, and provides 24/7 cybersecurity monitoring, server whitelist protection, and online support. Enhanced packages include client DNS security, digital signature, penetration testing, and cybersecurity advisory.

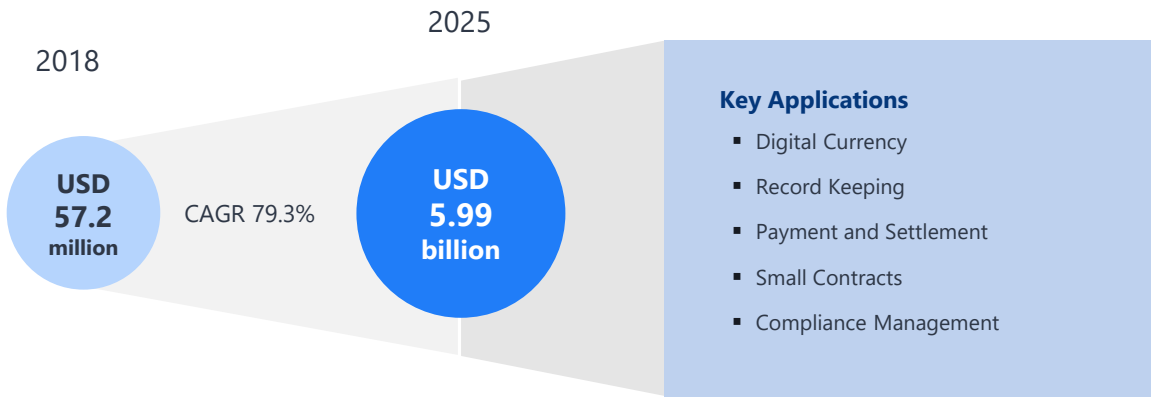
Source: MDEC

Blockchain Innovation to create a secure system

Malaysia needs to tap into emerging technologies innovations to further develop its capabilities and improve the effectiveness and accessibility of the technology. Blockchain technology creates opportunities to unlock a more secure form of authentication and transparency in building an efficient cyberspace.

Blockchain technology has seen rapid growth in recent years, especially in the banking, financial services and insurance (BFSI) market. The Asia-Pacific region has the highest growth in the application of digital currency, record keeping, payment and settlement, small contracts and compliance management.

Blockchain revenue in Asia-Pacific Region



Source: Allied Market Research

KEY PRIORITIES

Malaysia has the capabilities to advance in blockchain innovation and development:

- Blockchain-enabled platform will enable interoperability between financial institutions as the key factor to fuel market growth in Malaysia as well as within ASEAN countries.
- Increase in demand for scalability, transaction capacity, transaction processing speed as well as financial crime reduction.
- Upsurge in cross-border payment increases demand for secure and instant transactions with currency exchange services.

Malaysia's current blockchain strategy is outlined in the National Blockchain Roadmap 2021-2025, with the aim of strengthening Malaysia's leadership in blockchain for economy competitiveness and growth. Five building blocks have been determined to build a conducive ecosystem for blockchain technology: through collaboration, amplifiers, talent, legal and governance, and enablers, involving both public and private actors. Further developments in this field will bring value for Malaysia to position itself as ASEAN's Digital Capital.

e-estonia

Estonia – the digital society secured by Blockchain

Estonia is supported by a secured and transparent digital-first approach – Keyless Signature Infrastructure (KSI) blockchain technology that contributes to Estonia's national security:

- Compromise-free network, system and data
- 100% data privacy
- Data interoperability between systems and across boundaries
- Immutability of data
- Mitigate insider threat effectively
- 100% trust in government data

This technology has been widely used in Estonia's operational registries such as Judicial, National health, commercial code systems, cybersecurity and data embassies

Source: e-Estonia

Summary

Digital security plays a significant role in enabling a secure environment to drive the digital economy. This chapter covered four key areas of Malaysia's current digital security landscape: governance leadership and cooperation, policies and regulation, innovation and capacity building as well as infrastructure and emerging technologies resilience. The opportunities for Malaysia to develop towards becoming ASEAN's Digital Capital are illustrated in the following chart.

	Accelerate	Institutionalise	Develop	Review
Leverage	◊ Digital security awareness and culture for consumers	◊ Culture of security for SMEs and adoption of cybersecurity Δ Data Sharing Policy Δ Cross-border data flow frameworks	Δ National Blockchain Strategy and Standards ◊ Talent development and retention through Cybersecurity Career Framework	
Differentiate	◊ Blockchain innovation and development ◊ Cybersecurity innovation capacity through R&D and the startups ecosystem		Δ National data sovereignty and localisation policy Δ Harmonisation agent for ASEAN cyber and data security policy	

Legend: Δ Regulations and Policies ◊ Investment

With all this in place, Malaysia will be able to accelerate digital maturity in a secured and trusted environment for government, businesses and individuals, with the flexibility and confidence to operate, innovate and respond efficiently to cyber threats. This will serve as an enabler for Malaysia to achieve its aspiration as ASEAN's Digital Capital.

Overall Framework for Digital Security

Creates trust in systems, businesses and data, so countries and organisations can optimise the digital risks, make transformational change and enable innovation with confidence; balancing between protection and innovation; human and cyber protection

	Governance Leadership & Cooperation	Policies & Regulations	Innovation & Capacity Building	Infrastructure & Emerging Technology Resilience
Digital Security Areas	Governance Model and Authority CERT and Inter-agency Cooperation Bi-/ Multi-lateral Agreements International Participation	Cyber Strategy and Policies Cybercriminal Legislation Data Residency and Protection Cyber Compliance Standards	Research and Development Education and Training programmes Professional Accreditation Public Awareness Building	Critical Information Infrastructure Protection Technical Assessment, Implementation and Integration Emerging Technologies Transformation Security Analytics for Resilience
Future State	Forward-Looking Policy	Culture of Security	High Digital Security Innovation and Capacity	Blockchain Innovation
Benefits	Improved Trust	Speed to Maturity	Promote Innovation	Faster Response Time
	Enable a secure digital environment for individual, businesses and government	Ability to accelerate digital maturity in a secured and trusted environment	Trusted data and resources to accelerate R&D and innovation	Speed up response to digital threats through optimised operations

CHAPTER 5

Digital Talent equipped with diverse and emerging skills

Chapter Overview:

This chapter covers:

- Malaysia's diverse talent pool along with ASEAN's talent trends
- Malaysia's approach as a diverse and future-ready Digital Talent capital in ASEAN, namely, identifying the talent shortages, growing and retaining local talent, attracting global talent to fill gaps and building the network of ASEAN top digital talent capital

CHAPTER 5

Digital Talent equipped with diverse and emerging skills

Introduction

Digital talent is increasingly important to attract firms and investments. The availability of digital talent is crucial for countries to be competitive. Malaysia must ensure it has enough skilled and highly qualified digital talent to position itself as the preferred destination for top global firms and strategic high-tech and digital industries.

Building a diverse and future-ready network of top talent to support the emerging digital ecosystem and realisation of Malaysia as the digital talent capital in ASEAN.

Diverse: multi-lingual, multi-cultural and multi-competencies

Future-ready: equipped with emerging digital skills

Overview

In this chapter, we will be focusing on how Malaysia should turn its diversity into strengths, and upskill its workforce with the relevant digital skills to develop a diverse and future-ready talent pool in order to:

1. Support the emerging digital infrastructure, security, and technology that forms the future digital ecosystem
2. Remove the entry barriers to attract global talent to fill up the skills and talent shortages
3. Build a network of ASEAN top digital talent for long-term digital growth

Malaysia's talent landscape

Malaysia's economic transformation is relatively phenomenal, where within a generation it has moved from a low-productivity agrarian-based economy to an economy based on manufacturing and services. Malaysia, an upper-middle income country with a population of 32.7 million people, has successfully transformed from a commodity-based economy that was dependent on rubber and tin exports into a more diversified industrialised economy. Malaysia's GDP per capita increased from USD234 in 1960 to USD11,414 in 2019 with an average income growth of 7 per cent per annum during the period.

Malaysia is in a well-placed position to take advantage of emerging technologies

Emerging technologies such as automation and digital technologies like Big Data, IoT, Artificial Intelligence (AI) increase productivity, spur innovation, and improve livelihoods. LinkedIn's Emerging Jobs Report indicates that Malaysian talent is already responding to these trends.

Malaysia has a multi-cultural and well-educated workforce with both business acumen and technical skills. The diversity in its workforce – multi-ethnic and multi-lingual is a competitive advantage that is almost unparalleled in the region.

Malaysia demographics

- Over two-fifths (41.5%) of Malaysians are below 25 years old)
- High literacy rate of 95% (aged 15 years old and above)
- Greater KL has a strong pipeline of skilled young talent – over 330,000 tertiary students enrolled in 240 higher learning institutions (including universities, polytechnics and colleges)
- Nearly one-third of workforce (31.8%) have tertiary education
- Balanced male-female gender ratio: 109 males per 100 females

52.8% Investors perceive 'Skilled Workforce' as the key attractiveness

IMD World Competitiveness Report 2022

3rd Largest digital talent population in ASEAN

LinkedIn Talent Insights

2nd Most competitive talent hub in ASEAN, 34th globally

Global Talent Competitiveness Index 2021

Malaysia's top emerging digital jobs

Software engineers form the highest group of professionals working in the digital industry. Paradoxically, it is also the most demanded and fastest growing skill.

1. Data scientist
2. Full stack engineer
3. Data engineer
4. Cybersecurity specialist
5. Digital marketing specialist

Source: LinkedIn Emerging Jobs Report Malaysia 2020

Sources: DOSM; Current Population Estimates, Malaysia, 2022, World Bank; Literacy adult total; United Nations Educational, Scientific and Cultural Organisation (UNESCO) Institute for statistics; List of Universities in Malaysia, 2018, StudyMalaysia

The drivers impacting the future of Malaysia's talent base

This section analyses the drivers and trends that impact on the quality and quantity of future digital talent in Malaysia. The table below shows the performance trend of Malaysia in terms of talent skills and markets based on the Global Competitiveness Report by the World Economic Forum.

Indicators (1–100 best)	2018	2019
Skills		
Extent of staff training	72.6	▼ 71.0
Quality of vocational training	70.8	▼ 68.1
Skillset of graduates	71.8	▼ 67.9
Digital skills among active population	73.1	▼ 72.8
Ease of finding skilled employees	71.4	▼ 67.9
Talent Market		
Redundancy of cost (salary)	58.6	▼ 58.5
Hiring and firing practices	66.3	▲ 66.7
Flexibility of wage determination	75.3	▼ 73.3
Ease of hiring foreign labour	59.6	▲ 63.0

Sources: The Global Competitiveness Report 2018 and 2019
Notes: The latest version of the Global Competitiveness Report (2020) has no comparable country indicators since it is a global review on COVID-19.

Education system

- Decline in education system and quality of curriculum contribute directly to talent skill gaps.
- Mismatch between education syllabus and the requirements of the industry is represented by the decline in skillset of graduates, digital skills among active population, and quality of vocational training.
- Science, technology, engineering and mathematics (STEM) remains stagnant and affects language skills, critical thinking, and analytically problem-solving skills.

Talent Shortage

- A Hays study shows 84% of Malaysian jobseekers are willing to leave for an overseas opportunity – a brain drain issue.
- Increase of gig workers – firms use technology to segment work in new ways and increase the use of temporary labour instead of permanent employees.
- Redundancy of salary and flexibility of wage determination declined due to salary inconsistency that is not reflective on market demand benchmarking.

Skills Deficit

- Limited view on the skill and talent shortage landscape.
- Limited accessibility and awareness of relevant upskilling and reskilling opportunities, employers' reluctance to invest in training their employees and reliance on foreign talent.
- Lack of programmes to attract high-skilled global talent to fill specific skills gap.

Various parties are working collectively to address talent issues

Cognisant of these issues, the Government has embarked on various structural reforms to address them.

MDEC National Digital Talent Development Strategy Framework aims to address digital talent issues with holistic coordinated strategic policies and interventions. MDEC also has launched the Digital Skills Training Directory in August 2021 to make it easier for individuals to upskill themselves.

Human Resources Development Corporation Industrial Skills Framework to guide individuals, employers, and trainers to recognise knowledge, experiences, skills and promote industry lifelong learning, and expanding its claimable programme to cover digital skills.

Ministry of Human Resources (MOHR) Leading the strategy outlined in the Malaysia Digital Economy Blueprint to develop professional digital talent including 20,000 cybersecurity experts and 30,000 data professionals by 2025.

TalentCorp, an agency under MOHR, works to attract, nurture and retain the right talent and expertise to support Malaysia's journey towards greater economic progress.

ASEAN Digital Talent trend

The digital talent gap poses a challenge for employers worldwide and is expected to continue. This section draws on inputs from key subject matter experts, secondary data and relevant studies on human capital development.

The Workforce

There are 1.24 million digital professionals in ASEAN with Indonesia, Philippines and Malaysia being the top 3 countries with a digital workforce. Malaysia's hiring demand is 'very high' compared to other ASEAN countries, better than Indonesia (hiring demand 'moderate') and Philippines (hiring demand listed as 'high').

Top 3 digital workforce population in ASEAN and hiring demand

Indonesia '**MODERATE**'

Philippines '**HIGH**'

Malaysia '**VERY HIGH**'

Hiring and rebalancing the workforce

Hiring demand is on the rise as HR and business leaders around the world are facing digital talent shortage, especially in post-pandemic recovery.

Companies in Malaysia are hiring, but are facing shortages of talents post-pandemic. It is a continuous challenge to find employees with the right skill-set and experience. Retaining talent and addressing talent mismatch remains a challenge.

40%	of companies have difficulty retaining talents
34%	of companies have a turnover rate that is higher than the global average

Increase of gig talent (freelancers)

The gig economy is defined as a large group of part-timers and freelancers working on a contractual or ad-hoc basis. They are also freelancers with a career that offers flexibility, that is well presented in companies such as Grab, Food Panda, Shopee and Lazada.

30%	of digital talent hiring companies in ASEAN are in gig/freelancing
60%	in freelancing with top 2 online players – Shopee and Fiverr

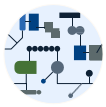
Sources: LinkedIn Talent Insights, Aug 2020; MDEC: Digital Talent Snapshot in Malaysia, Q2 2021.

Skills and Talent Market Performance in ASEAN

Based on LinkedIn's Future of Skill Report 2019, there are nine rising skills identified in ASEAN and all are digital related.


Blockchain


Continuous Integration


Artificial Intelligence


Gesture Recognition Technology


Frontend Web Development


Social Media Marketing


Robotic Process Automation (RPA)


Human-Centred Design


Workflow Automation

Source: LinkedIn's Future of Skill Report 2019

The table below shows the performance of ASEAN countries in terms of skills and talent market, with Malaysia and Singapore leading in most areas, ahead of Indonesia and Philippines. The data provides an opportunity to explore potential challenges and opportunities in relation to building Malaysia's future-ready talent.

Global Competitiveness Report 2019

Indicators (1–100 best)	Malaysia	Singapore	Thailand	Indonesia	Philippines	Myanmar	Laos	Brunei	Cambodia	Vietnam
Skills										
Extent of Staff Training	**71.0**	+ 2.3	- 15.9	- 10.7	- 5.3	N/A	- 21.1	- 20.2	- 22.6	- 21.6
Quality of Vocational Training	**68.1**	+ 5.2	- 16.5	- 8.0	- 5.7	N/A	- 22.4	- 10.4	- 26.0	- 24.1
Skillset of Graduates	**67.9**	+ 5.5	- 18.2	- 8.9	- 1.5	N/A	- 13.4	- 9.2	- 23.7	- 26.7
Digital Skills Among Active Population	**72.8**	+ 3.6	- 18.5	- 14.3	- 5.1	N/A	- 20.5	- 8.5	- 30.0	- 26.7
Ease of Finding Skilled Employees	**67.9**	+ 0.9	- 17.5	- 8.7	- 0.8	N/A	- 14.7	- 18.0	- 26.2	- 18.6
Talent Market										
Redundancy of Cost (salary)	**58.5**	+ 41.5	- 25.2	N/A	- 7.2	N/A	- 21.2	+ 41.5	+ 9.6	- 1.4
Hiring and Firing Practices	**66.7**	+ 10.3	- 11.0	- 8.4	- 16.4	N/A	- 22.1	- 17.6	- 16.0	- 12.1
Flexibility of Wage Determination	**73.3**	+ 10.6	- 16.9	- 9.9	- 3.4	N/A	- 7.2	+ 4.9	- 16.1	- 8.0
Ease of Hiring Foreign Labour	**63.0**	+ 26.0	- 10.5	- 6.2	- 11.3	N/A	- 13.8	- 28.0	- 6.5	- 10.9

Source: The Global Competitiveness Report 2019
Notes: The latest version of the Global Competitiveness Report (2020) has no comparable country indicators since it is a global review on COVID-19.

Position Malaysia as a diverse and future-ready Digital Talent capital in ASEAN

Diverse digital talent is the future of the workforce

Today, Malaysia is one of the most diverse regions in the world. Its residents vary significantly in a range of areas, including per capita GDP and population, and it is enriched with an array of cultural, linguistic, and ethnic diversity. Diversity can be either a strength or a weakness, and the future challenge for Malaysia is to ensure that the power of its diversity is unleashed while avoiding the potential of fragmentation.

In fact, given the increasing volatility and uncertainty of the global economy, turning diversity into a strength will be essential to sustain robust economic growth and development.

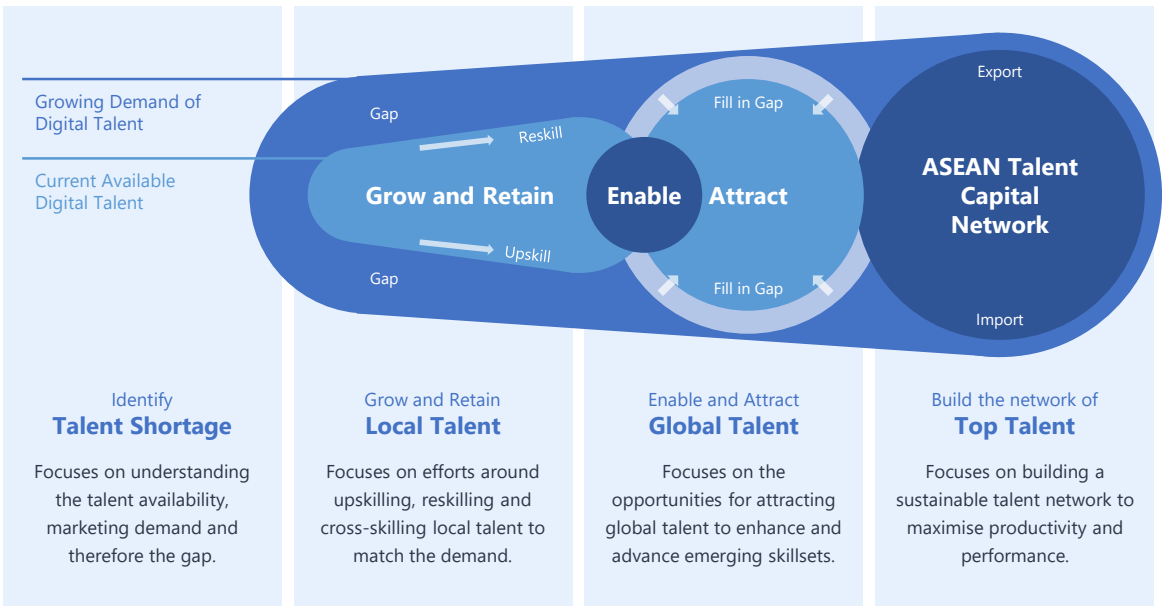
Turning diversity into a strength will be essential to sustain robust economic growth

There are multiple benefits of having a diverse talent pool and workforce. Below are some of the key benefits.

- **Innovation** – People with different background bring a new perspective and innovative ideas.
- **Competition** – Diverse competency and multi-disciplinary workforce compound and amplify productivity, performance and therefore competitiveness.
- **Adaptability** – In a digital world that changes constantly, adaptability is key. Multi-cultural setting helps people to learn from each other and adapt to the dynamic working environment.
- **Tapping into new markets** – International employees bring language skills and cultural awareness to support new and existing businesses in emerging economies.

Grow, retain and attract talent to build a network of top Digital Talent

Digital talent that carry out, adopt, and sustain tech-enabled transformations deserve as much attention as the technological solutions they create and oversee. When an organisation (public and private sectors) manage talent development effectively, it creates a virtuous cycle of high performance, sparking impactful innovation. The graphic below highlights the focus on growing, retaining and attracting talent that is vital to build a network of diverse and future-ready digital talent.

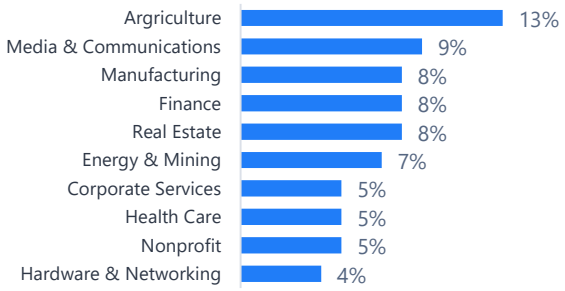


Identify the talent shortage to match the demand

Malaysia can pinpoint the strengths and gaps in their pool of tech talent and prioritise investments to boost competitiveness

As Malaysia progresses to a knowledge and innovation-oriented economy, its key industries require a highly skilled workforce.

Top 10 growth sectors in digitally skilled hires



Source: LinkedIn Emerging Jobs: Malaysia – The fastest growing jobs in the country

Critical Occupations Report 2020/2021

31% 13 out of 42 (31%) of occupations are digital related

Top reasons of hard-to-fill:

1. Lack of relevant job experience
2. Lack of the required technical skills
3. Difficulties in talent retention because of new work arrangements

Source: Critical Occupations Report 2020/2021

Matching the talent supply shortage and demand

As new roles emerge and skills requirements change, the existing pool of skilled workers remains insufficient to meet the industries' demands. Malaysia needs to develop, attract and retain talents that are key towards its aim to become a high-income and developed nation by 2030.

KEY PRIORITIES

1. **Analysing the skillset requirements and market demand** – understanding digital skills versus technological skills and where they overlap, understanding what skills to grow and upskill and where to evolve and reskill.

Digital Skills

Skills that are more general but essential and relevant to all types of businesses, regardless of business size, type and sector. For example:

1. Digital design: user experience (UX) designer, product designer, visual designer
2. Digital marketing: social media marketer, search engine optimisation specialist, performance marketer
3. Data analytics: business intelligence, data analyst, data visualiser

More common to grow (and upskill)

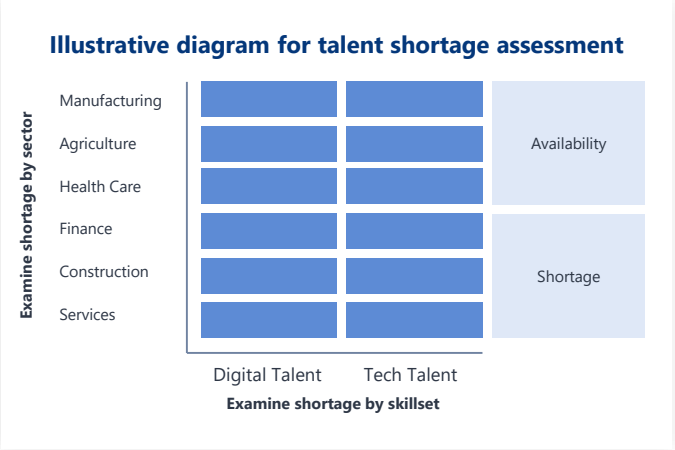
Technological Skills

Highly technical skills, and skills foundation vary based on sectors, business types and technological trends. For example:

1. Development: Python developer, Objective-C developer, Android developer
2. Engineering: data engineer, security engineer, network engineer
3. New tech: IoT, Artificial Intelligence (AI), robotics and automation, cybersecurity

More common to evolve (and reskill)

2. **Conduct research activities** – to compare actual, current and projected in demand against skillset shortages (by industry and geography) to address the market demand. Skill relevancy is key to address the market shifts and rising demand.
    a. **Examine shortage by skillset** – identify talent availability and shortages by competency.
    b. **Examine shortage by sector** – further breakdown availability and shortages by sector.



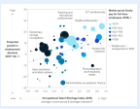
3. **Leverage on data** – for such a complex and fast-moving market, data can help anticipate market demand. It is important to make talent data available, undertake data-driven insights and actions, through the use of data analytics to make well-informed decisions on talent development.
4. **Establish a stronger common platform and committee** – with public and private representatives, identify and continuously monitor critical occupation and skills shortages for call to action and inform workforce development policies and programmes.

With the talent and skill shortages identified, we will be equipped with information for the next strategic actions.

CASE STUDIES

Malaysia's Critical Skills Monitoring Committee by MOHR and TalentCorp

To monitor skills imbalances and to provide a platform for the coordination of human capital development policies through the identification of critical and hard-to-fill occupations.[1]



UK's Occupational Talent Shortage Index: Pinpointing talent tightness, today and in the future

Looking into three dimensions: Projected growth in employment demand, Occupational Talent Shortage Index, and Median gross hourly pay for full time employees, to tackle the UK's looming talent shortage.[2]

Sources: World Bank; McKinsey

Grow and retain talent to bridge the fast-widening gap

Availability of skilled workers is vital to a competitive and innovative digital ecosystem and sets successful digital ecosystems apart from those that fail. Holistic solutions that prioritise skills development would address inclusive human capital development, ensuring that technology does not widen economic inequality.

Malaysia needs to optimise its existing and untapped talent, ensuring a strong and sustainable digital talent pool that industries can leverage on to meet their demand.

The rise of technology and data is driving demand for Digital Talent

The availability of digitally skilled talent is critical to meeting the needs of the country's economic development. Malaysia will need to continually develop and broaden its talent's skillsets to stay competitive.

Malaysia's top 5 fastest growing emerging digital jobs in 2020

1. Data Scientist

Demand for Big Data is growing. The market for Big Data Analytics is expected to grow from USD1.1 billion in 2021 to USD1.9 billion (about RM7.85 billion) in 2025.

2. Full Stack Engineer

As Malaysia ramps up its digitalisation efforts, the versatility and efficiency of this skillset has them in high demand.

3. Data Engineer

The rise of data is driving demand for data scientists who can build, test and maintain Big Data and processing system.

4. Cybersecurity Specialist

Cybersecurity specialist keeps computer information systems secure against cyber attacks and implement mitigation measures.

5. Digital Marketing Specialist

Digital marketing specialist uses data to run online marketing campaigns has become a common outsource function.

Source: LinkedIn Emerging Jobs Report Malaysia 2020

Infuse digital knowledge in all aspects of workforce learning opportunities

As organisations seek to be more competitive in today's changing digital ecosystem environment, ensuring an adequate supply of high-potential and high-performing workers will be a critical success factor particularly for knowledge-intensive industries.

KEY PRIORITIES

1. **Accelerate Technical and Vocational Education and Training (TVET) education**
    a. Raise the standard and quality of ICT curriculum and infuse digital modules that focus on competencies and adaptability rather than job specific and ensure continuous relevance of curricula through industry-academia collaboration.
    b. Create a single national TVET brand to make TVET the preferred choice. Promote recognition of TVET qualification to industries and provide greater accessibility and raise profile through industry events.
    c. Establish an independent governance body as the central coordinating body for all TVET programmes and create a sustainable financing scheme to ensure that sufficient funds are available for TVET..

The TVET Empowerment Cabinet Committee (JKKPTVET)

Set up in August 2019 with the aim of developing a new national strategy for TVET that responds to industry needs.

Source: Implementing the Future ASEAN Agenda For TVET

2. **Build awareness, accessibility and leverage on learning programmes** – There has been significant investment by both the public and private sectors in continuously upgrading human capital towards a knowledge-based economy.

Malaysia learning programmes and initiatives by both private and public sectors

PENJANA HRDF

A training incentive programme in collaboration with various ministries and agencies that focuses on reskilling and upskilling Malaysians to enhance the employability of the unemployed.

Huawei ASEAN ICT Academy

Dedicated training module open to all universities, academies, vocational training institutes, polytechnics, etc., to build a talent ecosystem and boost the ICT industry's development.

Let's Learn Digital

MDEC partners with the likes of Coursera, Google, LinkedIn, Facebook and more to provide free online digital training to the rakyat.

Digital Skills Directory

Provides a catalogue of courses that address in-demand digital skills.

MYWiT

MyDigitalWorkforce Work in Tech (MYWiT) incentivizes employers to upskill and reskill hires through salary and training incentives, under Digital Business Services (DBS) and Digital Tech Apprenticeships (DTA).

#mydigitalmaker

A joint public-private-academia initiative led by MDEC in partnership with the Ministry of Education to prepare students towards IR4.0.

3. **Nurturing the Malaysian talent through greater cross-sector collaborations:**

   a. **Industry-academia collaboration** – to address skills mismatches in the Malaysian talent market and strengthen graduate readiness for the workplace, ensuring an adequate supply of high-potential and high-performing talent that will be critical for the success of knowledge-intensive industries.

TalentCorp facilitates Industry-Academia Collaboration (IAC)

TalentCorp facilitates the Industry-Academia Collaboration (IAC) as a means of fostering greater partnerships between industry and academia, towards improving the work readiness of graduates.

Through this initiative, employers and higher learning institutes collaborate on key areas such as curriculum development and delivery, industry attachments and exposure, and competitions.

   b. **Cross-industry collaborations** – across federal, state and local governments. These partnerships and collaboration will be most effective to address sectorial challenges, uplift digital knowledge and emerging digital skillsets, and cultivate innovation with cross-industry experiences.

Cross-sector innovation collaboration

RISE and MDEC to revitalize the Malaysian ecosystem in Cross-Industry Virtual Hackathon, with the support from private sector such as Celcom, EcoWorld, Malaysia Airlines, GuocoLand and Pos Malaysia.

Sources: PENJANA HRDF; Huawei; MDEC; NST; Malaysia Kini

4. **Collaborate with HR to revamp hiring strategies and invest in upskilling talent** – the rapid changes in digital needs require firms to invest in upskilling the workforce. With Industry 4.0 and technological advancements transforming the way we live, communicate and work, firms need to retain and develop talents.

HR Certification Programmes to raise the bar of the HR profession

Exchange between TalentCorp and four local training providers of HR Certification programmes, which will encourage more HR practitioners in Malaysia to gain professional certifications.

Promote Talent Diversity and Advocating Future-Relevant Workplace Policies

To create an environment that encourages Diversity and Inclusion (D&I), TalentCorp provides end-to-end advisory services to support companies in adopting Work-Life Practices (WLPs) and supports companies in their efforts to implement policies and practices which encourage greater workplace flexibility and enhance employee efficiency.

Retaining top talent and address the brain drain issue

Malaysia experiences high levels of net outflow of skilled talents compared to other countries. Left unaddressed, it can derail the national target of attaining high income nation status by 2030.

Singapore's TalentPass

To attract talent, Singapore announced the Overseas Networks and Expertise Pass to be launched in 2023 to scout top global talent. Those under the pass would be granted a longer stay duration compared to a regular employment pass and their spouses would be able to work in Singapore. To qualify, applicants must earn a minimum fixed monthly salary of SGD30,000.

Singapore will also be offering a five-year pass from September 2023 onwards for certain jobs in the tech industry, requiring applicants to have a minimum monthly salary of SGD10,500.

Source: SCMP

1990 **121,000** 2010 **311,000**

Number of Malaysians living in OECD countries increased

72% Career opportunities is the main reason for Malaysians living abroad

Source: The World Bank

KEY PRIORITIES

1. **Optimising incentives and policies** to keep top talent and address brain-drain issues
   a. **Education incentives consistency** – Updating the talent education policies to address the possible gaps in education access incentives. Equal and open access to quality education and skills training fit for Malaysia's workforce is vital.
   b. **Salary benchmarking (Pull Factor) -** Competitive pay and remuneration is important to retain and attract talent. Malaysia wages remain low compared to high income countries such as Singapore and need to be addressed urgently to avoid talent outflow.

   The table in the next page illustrates Malaysia's current salary amount based on the top 5 emerging digital skills, in comparison with the other ASEAN countries.

Sources: TalentCorp; The future of talent in Malaysia 2035

Comparison of emerging digital jobs salary in ASEAN (for illustration purposes only)

Country	Malaysia	Singapore	Thailand	Indonesia	Philippines
Income Classification by World Bank's GDP Per Capita					
Income Category	**Upper Middle**	High	Upper Middle	Upper Middle	Upper Middle
GDP Per Capita (2021)	**RM 47,439**	RM 325,862	RM 32,378	RM 19,208	RM 15,882
Average Monthly Salaries by Salary Expert as of August 2022 (*illustrative only)					
1. Data Scientist	**RM12,555**	**RM30,082**	**RM8,207**	**RM10,395**	**RM6,165**
2. Software Engineer (alternative to Full Stack Engineer)	**RM12,155**	**RM29,796**	**RM10,516**	**RM10,182**	**RM4,481**
3. Data Engineer	**RM11,171**	**RM26,767**	**RM7,303**	**RM9,250**	**RM5,486**
4. Information Security Specialist (alternative to Cybersecurity)	**RM8,198**	**RM19,642**	**RM5,359**	**RM6,788**	**RM4,026**
5. Digital Marketing Specialist	**RM6,750**	**RM17,702**	**RM5,984**	**RM5957**	**RM2,942**

Disclaimer: The salaries indicated are derived from salary online aggregation tools such as Salary Expert. The salary amount may not be representative of all seniority and similar job titles.

Income Category definition:
Low Income = RM 4,681 or below per capita
Lower Middle-Income = RM 4,681 – RM 18,327 per capita
Upper Middle-Income = RM 18,327 – RM 56,816 per capita
High Income = RM 56,816 onwards per capita

2. **Retain top talent and facilitate the return** of Malaysian professionals

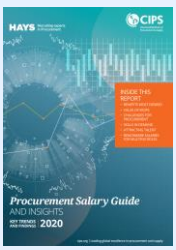
   a. **Connecting job opportunities** – connecting Malaysians to job opportunities by breaking down information barriers and facilitating interactions between applicants and recruiters, through job portals and career fairs.

   b. **Enabling environment** – increasing efforts to meet the broader family needs of returning Malaysians, such as enabling non-national spouses to work and facilitating schooling of children.

Returning Expert Programme (REP)

Targets highly-skilled Malaysians abroad who are interested in returning to Malaysia. Returning Malaysian professionals who qualify under the REP are eligible for benefits and incentives which are designed to ease their transition back home. This includes an optional 15% flat tax rate on chargeable employment income for five consecutive years, and permanent residency status eligibility for foreign spouse and children subject to the approval of the Immigration Department of Malaysia.

CASE STUDIES



UK's Procurement Salary Guide

The CIPS/Hays Procurement Salary Guide delivers in depth statistical analysis and expert insights to allows procurement professionals and employers to:

- Evaluate the perceptions of procurement
- Benchmark salaries and bonuses for different roles
- Highlight career aspirations
- Gain insights on how to attract, retain and develop talent

Sources: TalentCorp; Chartered Institute of Procurement and Supply

Attracting high-skilled global talent to fill the gap

To be catalysts of new development and complement the industry, not substitution

Malaysia is an attractive location for global talent given its business-friendly policies, low costs but with high standard of living.

Malaysia's efforts to attract global talent

Residence Pass-Talent (RP-T)

To grow foreign talent in Malaysia, especially in key sectors like oil and gas, businesses and education. RP-T offers a range of benefits including a 10- year pass to live and work in the country, flexibility to move from one employer to another, and eligibility for spouses to work.

eXpats Service Centre

A one-stop service centre for processing Foreign Knowledge Worker (FKW) employment needs.

The DE Rantau programme

The DE Rantau programme aims at establishing Malaysia as the preferred digital nomad hub in ASEAN while boosting digital adoption and promoting digital professional mobility and tourism across the country.

The DE Rantau programme will benefit both local talents and foreign nomads via the creation of a vibrant ecosystem that supports digital nomads. Digital nomads can travel and work remotely across various locations in Malaysia, while having access to stable broadband connectivity and various other facilities and services that support the nomadic lifestyle

Attract global talent to complement the industry gap instead of substitution

There are capabilities and skills that are relatively new to Malaysia and which local talent do not have. For those specific skills, global talent will be needed to fill the skills and experience gaps in order to meet growth demands, and to infuse local talent with knowledge to increase digital competencies.

KEY PRIORITIES

1. **Talent catalyst not reliance** – The inflow of global talent into the local talent pool can also have positive spillover effects and exponential benefits as they interact and collaborate.
2. **Address skill deficit** – Attracting global talent with new digital skills that Malaysia lacks while Malaysia upskills and reskills the current workforce.
3. **Global market** – Expanding into foreign markets is extremely complex; hiring global talent could help global companies to enter and strive in a new market or a particular region, with their expertise and experience.

CASE STUDIES

Singapore turns to foreign talent

Although 20% of Singapore's workforce are foreigners, the Government is starting a new programme to get more foreigners to work in Singapore. This new programme is set to remove the quotas for an Employment Pass (EP) as Singapore targets to attract foreign professionals, managers, executives and technicians (PMETs) interested in working in Singapore as core team members of technology companies to enhance Singapore's competitiveness.

New Zealand's Working Holiday Visa

Visa for foreigners, to explore, work or study in New Zealand during their six months stay. However, there is a quota and age requirement in selecting applicants.

Italy introduces new tax incentives to attract foreign talent

Italy has revised and extended the benefits for workers who transfer their tax residence to Italy. This reduction is one of the widest across Europe and will allow foreigners (employees, freelancers or retired) to come to Italy with a relatively low tax rate on their worldwide income.

Sources: TalentCorp; MDEC eXpats; The ASEAN Post; New Zealand Department of Immigration; HLB

Promote digital thought leaders to inspire and attract global talent

Thought leadership can be a great business development and marketing asset. It is a powerful employee recruitment tool that can attract the best talent. Malaysia has world-class experts in various sectors such as manufacturing, IT, digital technology, and others, who can be tapped to attract talent.

Carsome

Carsome is Malaysia's first tech unicorn startup. Founded in 2015, Carsome is one of South East Asia's largest used car e-commerce platforms, alongside Carro and Carousell. The platform helps with inspections, ownership transfer and finances between consumers and used car dealers, handling around 100,000 car transactions annually.

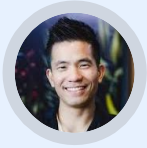
Using thought leadership as a talent magnet

Malaysia can deploy strategies to identify, nurture and promote digital leaders to inspire both local and global talent.

KEY PRIORITIES

1. **Identify and groom digital thought leaders** – It is crucial for Malaysia to identify digital leaders and groom them to grow a pool of high performing Malaysian talent. This will enable Malaysia to be recognised for the development of top-quality talent capable of contributing to a country's growth and ambitions.
2. **Influence local and global talent** – Influencing and inspiring talent is one of the areas Malaysia could look into to achieve its transformation ambition. This involves ensuring thought leaders are involved in professional associations, societies and committees to reach a wider audience and inspire Malaysia's talent pool to contribute to the nation's growth.

Malaysia's potential digital thought leader examples



Khailee Ng

Tech startup investor and founder. Venture Partner, 500 Startups. Co-founder of GroupsMore and SAYS.com. Chairman of REV Asia. His ambition is to help create the next generation of Southeast Asia's startup success stories.

Vishen Lakhiani

Founder of Mindvalley, a global brand that invests in, creates and builds businesses that align with its goal to push humanity forward.

Kamarul A Muhamed

Founder of Aerodyne, a company specializing in aerial imagery, with over 400 drone professionals operating in the Unmanned Aerial Vehicle (UAS) services sector. Named the EY Entrepreneur of the Year (EOY) 2020 Malaysia.

Build the network of ASEAN top Digital Talent capital

Build a talent platform to maximise talent productivity, performance and sustainability in the new digital era.

There are 5 million LinkedIn accounts in Malaysia. Digital platforms such as LinkedIn and JobStreet have changed the way employers and employees connect and learn about job requirements; Glassdoor provides the inside scoop on what employees say about their job satisfaction and company culture; and Coursera and LinkedIn Learning offers upskilling and reskilling.

Malaysia could build a network of top digital talent in ASEAN. Such a platform allows employers and talent to understand job requirements better, identify market gaps, help talent gain new capabilities, chart career paths, and nurture the development of the next generation of digital thought leaders. The Malaysian Government has established its own job portal, MyFutureJobs, which also doubles up as a data repository of recipients of wage subsidies and hiring incentives from the government. This could possibly act as a foundation to build the digital talent network to enhance Malaysia's capabilities as ASEAN's Digital Capital.

Opportunities at hand	Applications
1. **Building the foundation of career framework** – for employers and talent to learn more about job requirements. Leverage on existing HRDF Industrial Skills Framework, scale the framework with more complete digital related job titles that include detailed job descriptions, qualification requirements, and career paths.	Institutionalise the career framework and serve as the national standard (or minimum requirements) for hiring and for employees to benchmark themselves against the industry criteria.
2. **Crowdsourcing talent supply and market demand monitoring** – to identify the talent and skill shortages and bridge the gap. Employers can input the skills they require and employees can tag the skills that they are qualified in their profile, so that both these supply and demand crowdsourced data can be captured and represented to identify the gaps.	Human Resource management leaders from both public and private sectors can leverage on this data to enhance their talent development strategy, understand better where to grow (upskill), where to evolve (reskill), and more importantly, where to invest. Bridging the skills gap is an indicator of transformation and innovation in the industry.
2. **Centre of training resources and incentives –** for talent to gain access to upskilling and reskilling opportunities. Aggregate (or even host) training programmes, certifications, and incentives targeted at different segments, such as employees, employers, and trainers.	Talent could build their professional qualification profiles to showcase their training hours by skillsets, and certifications and awards received, so that employers have a better and more accurate view of talent's qualification.
4. **A platform for top talent network** – for both local and global businesses to understand Malaysia's talent market better, consolidate talent related events and insights, and for thought leaders to share their views on respective markets to inspire local talent and attract global talent.	This information would be useful in attracting global talent and even for investors to understand Malaysia's market movements and talent landscape.

HRDC – Industrial Skills Framework

Guide for individuals, employers, and training providers to recognise knowledge, experiences, skills and promote lifelong learning in the industry.

Singapore's SkillsFuture

SkillsFuture is an established Framework to promote lifelong learning culture with an emphasis on skills development required across different stages of life via a single portal access.

Sources: 2020 Emerging Jobs Report Malaysia; HRDC Malaysia; Singapore's SkillsFuture

Summary

Position Malaysia as a diverse and future-ready Digital Talent capital in ASEAN

Malaysia's population, diversity and future-ready talent pool is well positioned to place the country as ASEAN's Digital Capital.

The human capital community needs to reposition itself as an influential driving force for change, and create new and more comprehensive pipelines to grow, retain, enable and attract digital talent.

Improving the digital talent and workforce demands that businesses, governments and other key players cooperate to align learning opportunities initiatives, workforce development programmes and public policy. The long-term effort will be demanding and imposing, but nowhere as difficult as achieving success in a digital ecosystem where talent are not equipped for the work that needs to be done.

	Accelerate	Institutionalise	Develop	Review
Leverage	◊ Build awareness, accessibility and leverage on existing learning programmes ◊ Nurture talent through greater cross-sector collaborations ◊ Collaborate with HR to revamp hiring strategies and invest in upskilling talent	Δ Expand TVET with digital skills, raise standards, create consistent branding and awareness ◊ Conduct data-driven research to identify talent supply shortage ◊ Build the foundation of career framework for hiring standards		Δ Attract global high-skilled talent to fill up the shortage Δ Optimise policies on salary incentives policy and salary benchmarking
Differentiate			◊ Nurture, identify and promote digital thought leaders to inspire and attract global talent ◊ Build digital talent platform for sustainable network	

Legend: Δ Regulations and Policies ◊ Investment

CHAPTER 6

Digital Ecosystem: Driving value creation and attracting global players

Chapter Overview:

This chapter covers:

- Malaysia's current Digital Ecosystem landscape, with key programmes, incentives and existing players
- Value creation focus of the Digital Ecosystem, namely, Productivity Value, Innovation Value and Trade Value
- Ecosystem approach to drive the value creation, namely, Value Chain Digitalisation, Innovation Cultivation and Digital Trading
- Integrated partnerships and roles of Public and Private Sector

CHAPTER 6

Digital Ecosystem: Driving value creation and attracting global players

In a scenario of emerging technologies and increased competition, an increasing number of industries will converge under digital ecosystems. A digital ecosystem is an integrated network of diverse players and multi-industry solutions that provides a seamless value chain driving the digital economy.

Forming an integrated and future-ready digital ecosystem driving value creation and attract global players to enhance local development and accelerate the digital economy.

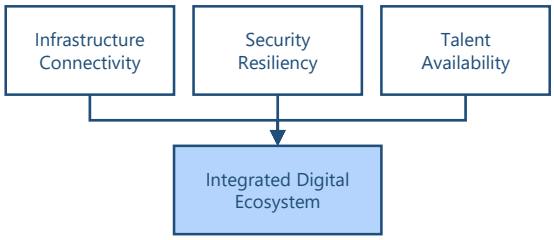
Overview

Robust foundation of an integrated and future-ready Digital Ecosystem

Malaysia has modern infrastructure, security resiliency, and a diverse and multi-competent labour force, all of which are vital for an inclusive and sustainable digital economy growth.

Malaysia remains an attractive investors' destination due to its strategic location, ease of doing business, favourable tax incentives, and is future-ready to be ASEAN's digital investment capital.

Malaysia is focusing on creating the next-generation digital value chain, a collaborative innovation ecosystem, and broader digital trading, strengthened by private-public sector partnerships.



Malaysia Digital Ecosystem landscape

Key drivers to an attractive Digital Ecosystem

A successful digital ecosystem is made up of four drivers, namely digital readiness, ease of doing business, innovation, and policy effectiveness. These factors lead to two focal points for investors: future-readiness and competitiveness.

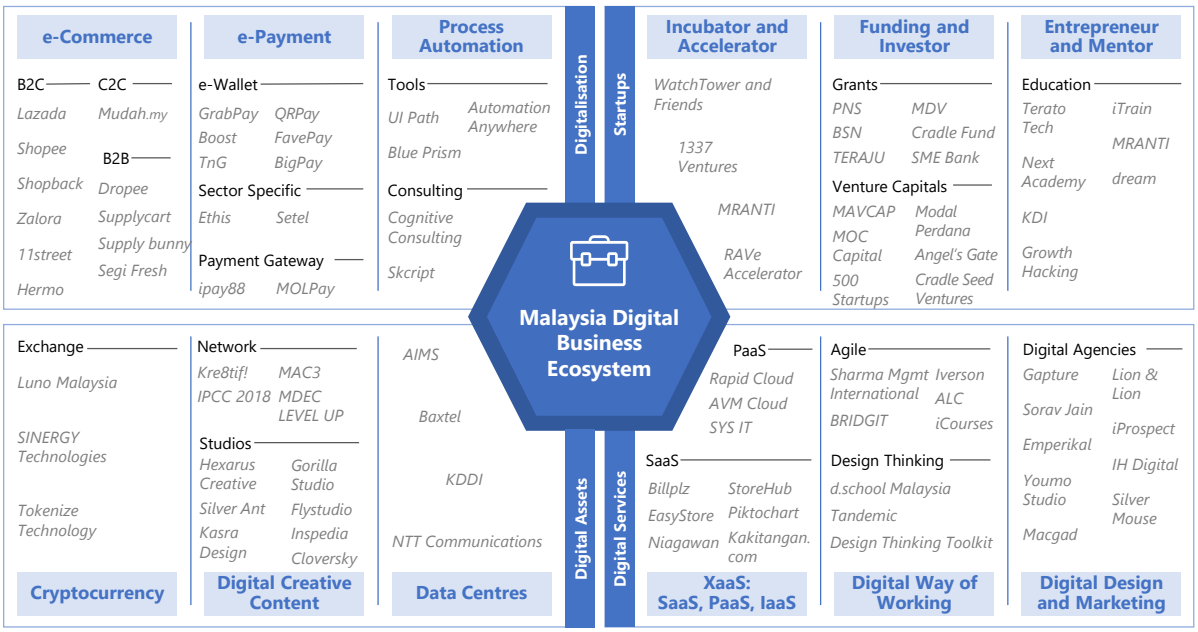
Malaysia ranks 2nd in ASEAN in all key drivers and attractive indicators mentioned above; and ranked the 2nd best country in ASEAN to invest in e-commerce and its digital sector.

Current digital players and competitive landscape in Malaysia

Leading multinational corporations (MNCs) are optimising business models to aspire towards "high-value, high-impact" central operating systems.

The COVID-19 pandemic has accelerated the decisions of MNCs to consider near-sourcing their ASEAN operations and the development of a regional hub with the most central and cost-competitive location to serve their supply chain management activities.

Today, Malaysia is home to a thriving digital ecosystem that businesses can leverage on to drive digitalisation and startup development. Investors and businesses can focus on their core activities and procure digital services and capabilities from dedicated solutions and service providers.



A suite of tax incentives and grants in place for digital and tech sector investments

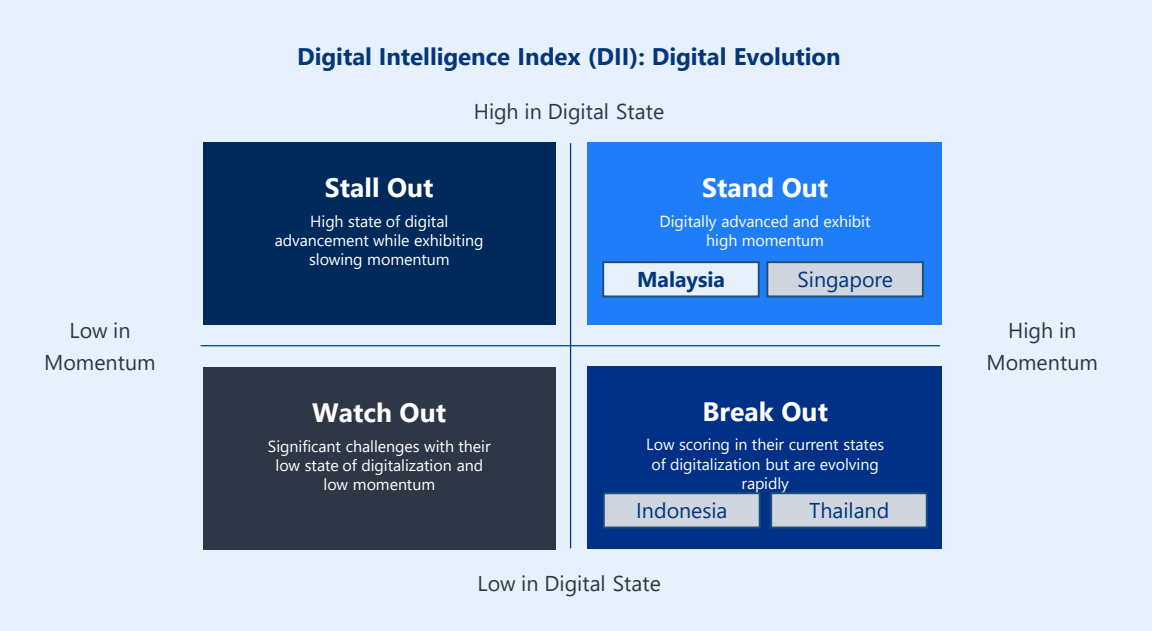
Malaysia's flexible tax regime continues to attract MNCs to locate their regional headquarters operations to Malaysia.

Tax Incentives and Tech Funds	Automation	ICT Equipment	Licensing or purchasing of new technology	Modernisation or upgrading of facilities and tools	Technology Adoption	Research and Development	Training Programmes	Project Funding
Automation Capital Allowance (CA)	■							
Accelerated Capital Expenditure for ICT Equipment and Software		■						
Business Loan Guarantee Scheme	■							
Domestic Investment Strategic Fund (DISF)			■	■		■	■	
High Impact Fund						■	■	
Industry 4.0 Fund					■			
Industry Digitalisation Transformation Fund					■			
Global Tech Fund								■
Digital Content Fund						■		■
The International Collaboration Fund					■	■		■
MOSTI Research and Development (R&D) Fund						■		
Contract Research and Development (R&D)						■		
Research and Development (R&D) Company						■		
Incentive for In-house Research and Development (R&D)						■		
Incentive for Automation Capital Allowance Expenditure	■					■	■	
Incentive for Productivity (SIRIM-Fraunhofer Programme)		■			■	■		

*Non-exhaustive

Malaysia fundamentals remain strong and attractive to investors

Malaysia is a "leading" country among ASEAN economies, exhibiting strong performance across key ecosystem drivers and attractiveness indicators.



Source: Digital Intelligence Index 2020

Malaysia's attractiveness

Malaysia is gaining traction as the MNCs' preferred destination to centralise their operations in the most strategic and cost- competitive environment. The chart below shows Malaysia's key attractiveness factors according to the Executive Opinion Survey by IMD World Competitiveness 2020.

Key Attractiveness for foreign investors		Percentage
1	Business-friendly environment	61.0%
2	Skilled workforce	52.9%
3	Cost competitiveness	50.7%
4	Reliable Infrastructure	43.4%
5	Dynamism of the economy	39.7%
6	Open and positive attitudes	34.6%
7	Policy stability and predictability	33.1%
8	Access to financing	30.1%
9	Quality of corporate governance	27.9%
10	Effective legal environment	25.0%
11	Effective labour relations	23.5%
12	Strong R&D culture	22.1%
13	High educational level	14.7%
14	Competitive tax regime	14.0%
15	Attitudes and values	12.5%

Source: IMD World Competitiveness Ranking 2020

Diving deeper to Malaysia's ecosystem performance and challenges

Competitiveness and future-readiness

Metrics (1–100 best)	2018	2019
Institution ▪ Future orientation and e-participation ▪ Intellectual property rights and protection ▪ Policy adaptiveness to digital business models	68.7	68.6 ▼
Product Market ▪ Domestic Competition ▪ Market dominance ▪ Trade openness	63.6	64.8 ▲
Financial System ▪ Venture capital and investment capability ▪ Financing to SMEs ▪ Bank regulation and soundness	84.1	85.3 ▲
Business Dynamism ▪ Cost and ease of starting a business ▪ Entrepreneur culture ▪ Growth of innovative companies	73.8	74.6 ▲
Innovation capability ▪ Interaction, diversity and collaboration ▪ Research and development and expenditure ▪ Commercialisation and buying sophistication	55.5	55.0 ▼

Sources: The Global Competitiveness Report 2018 and 2019

Challenges and opportunities at hand

Business agility

- **Startups struggling to survive** due to the COVID-19 pandemic and are experiencing stagnant growth in terms of innovative solutions and business models.
- **Business commercialisation** growth needs to be exponential to achieve the Digital Capital agenda, especially as SMEs are currently more domestic focused.
- **Cross-sector and cross-business** interaction is low and it is essential for an integrated collaborative ecosystem.

Regulatory adaptiveness

- **Regulation improvements** to adapt to new digital business model and to enable innovation such as data openness and FinTech regulations.
- **Future oriented government** has become a new form of expectation and criteria to develop an adaptive ecosystem for sustainable economic growth.

Future readiness

- **Investments** in R&D activities, innovations and startups continue to decline which severely impact market competitiveness
- **Digitalisation remains a challenge** to both public and private sector due to shortage of awareness.

ASEAN landscape on competitiveness and future-readiness

Malaysia and Singapore lead in all metrics, followed by Thailand. Indonesia and Philippines are catching up in areas of product market and business dynamism.

Metrics (1–100 best)	Malaysia	Singapore	Thailand	Indonesia	Philippines	Myanmar	Laos	Brunei	Cambodia	Vietnam
Institution	**68.6**	+ 11.8	- 13.8	- 10.5	- 18.6	N/A	- 25.8	- 10.3	- 26.7	- 18.8
Product Market	**64.8**	+ 16.6	- 11.3	- 6.6	- 7.0	N/A	- 10.7	- 4.4	- 16.3	- 10.8
Financial System	**85.3**	+ 6.0	- 0.2	- 21.3	- 17.0	N/A	- 30.1	- 30.2	- 28.9	- 21.4
Business Dynamism	**74.6**	+ 1.0	- 2.6	- 5.0	- 8.9	N/A	- 37.8	- 12.8	- 28.0	- 18.1
Innovation capability	**55.0**	+ 20.2	- 11.1	- 17.3	- 17.0	N/A	- 27.0	- 11.2	- 24.1	- 18.2

Source: The Global Competitiveness Report 2019

To address these challenges, stakeholders should shift their focus towards long-term value creation to address the needs of businesses, investors and end-consumers, resulting in a stronger local ecosystem in order to attract global investments.

Value creation to lead the focus for Malaysia Digital Ecosystem

Leading enterprises and governments around the world are providing customers with new experiences and stimulating the digital economy.

In most countries, the competitive landscape is rapidly changing. As a result, organisations are speeding through their lifecycles at an unprecedented pace. Digital is the driver of current changes and is affecting what end-consumers are demanding from the public and private sectors.

This section focuses on how value creation is affected by value chain digitalisation, innovative ideas, and expansion of digital trading.

Case studies on how tech giants, unicorns and other regions have opened up new value creation.

Amazon took advantage of digitalisation to create productivity value for its seamless value chain

Amazon has expanded its initial core business of selling books and CDs to becoming a large marketplace and evolving into new business areas.

Amazon introduced the Kindle and eBooks, ventured into streaming services to compete with Netflix and television networks, and is a leader in providing cloud services.

One of the lessons that can be learned from Amazon's digital transformation is to be willing to venture beyond one's core businesses.

Grab creates innovation value and disrupted multiple industries

1. **Challenging the transportation industry** – including taxi and delivery industries, with GrabCar and GrabDelivery
2. **Challenging the finance and banking industry** – with Grab e-Wallet, GrabPay as a payment method/gateway, and integrated bills and prepaid payments
3. **Challenging the loyalty programme industry** – with Grab's credit that's integrated to purchase and reward ecosystem
4. **Challenging the marketplace model** – with aggregated marketplace of Food, Mart, Hotels, Clean and Fix, and logistics

China a global leader in creating digital trade value with e-Commerce and e-Payment

Over the past decade, China has become a leading global force in e-Commerce, accounting for more than 40% of worldwide transactions. Today the value of China's e-Commerce transactions is estimated to be larger than the combined value of those of France, Germany, Japan, the UK, and the USA.

Silicon Valley became a global digital centre

Silicon Valley is home to over 2,000 innovative technology companies – a robust digital ecosystem with suppliers, customers, investors and innovators with active value creation of productivity, innovation and digital trade to develop a competitive advantage.

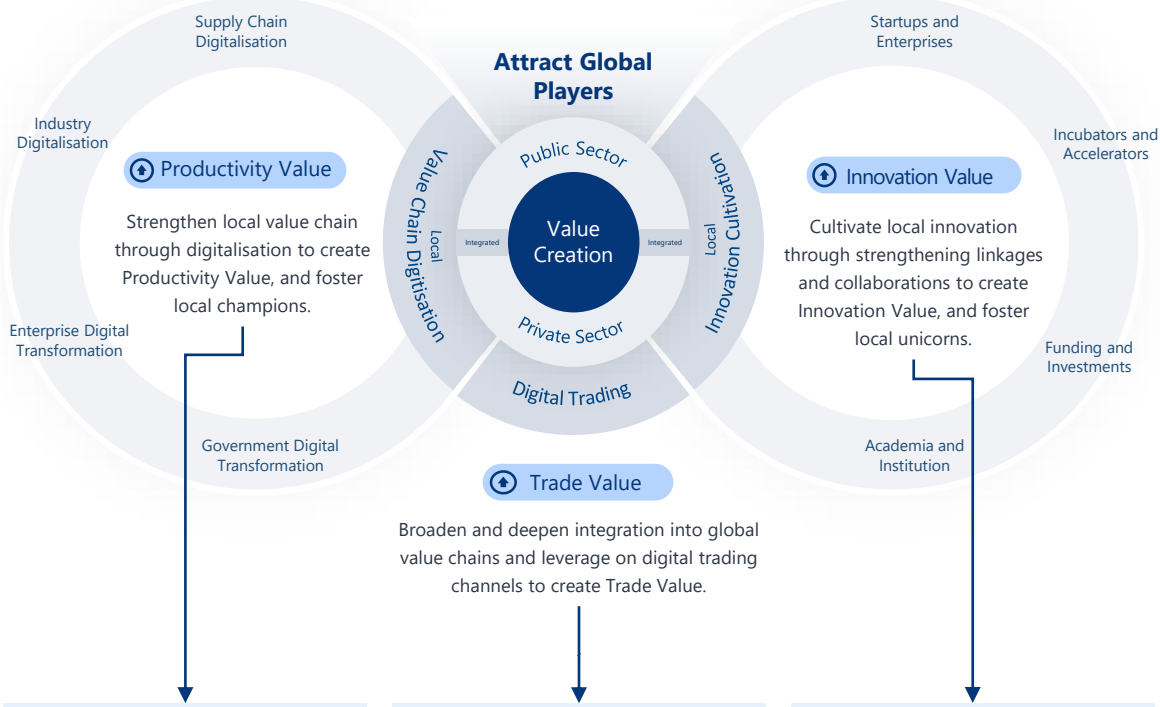
Silicon Valley also leverages heavily on cultural diversity, attraction of top foreign talent, investors, business owners and C-levels experts.

Sources: Digital Transformation and Value Creation: Sea Change Ahead - Srinivas Reddy and Werner Reinartz; China's Digital Economy A Leading Global Force

Creating productivity, innovation and trade values to attract global players

Game changers such as COVID-19, globalisation, digital transformation, talent market shift and the growing power of technology have challenged people and organisations around the world, including Malaysia. The COVID-19 crisis has amplified the importance of value creation and will likely further accelerate the adoption and enhancement of the digital ecosystem. Long-term value creation should take into account the interests of all stakeholders for sustainable growth.

Stakeholders in the private and public sectors need to have a clear understanding of what value creation means. Creating value is not limited to simply maximising profit, but should also include Productivity Value, Innovation Value and Trade Value.



Digital-ready Ecosystem

A productive and efficient value chain equipped with strong digital capabilities to support business growth.

Competitive Ecosystem

Competitive market with differentiated digital assets and services, enabling the trading and investment environment.

Innovation Ecosystem

Innovators and enablers work cooperatively and competitively to develop disruptive business models and ideas.

In the next section, we will dive deeper into each of these distinct value creations:

1. Digitalising the local value chain for high productivity
2. Cultivate local innovation and strengthen linkages
3. Integrating productive and innovative ecosystem into ASEAN value chain

Productivity Value

Digitalising the local value chain for high productivity

Digitalisation enables businesses and the Government to operate with greater productivity and efficiency. Adopting digital transformation and implementing digital technologies will enhance business performance and provide new opportunities for business growth.

Digitalising the value chain is critical to preparing for the future

Malaysia is one of the ASEAN leaders in deploying digital technologies to improve the efficiency of government operations and the delivery of public services.

However, challenges remain. Digital adoption by small and medium enterprises is lacking compared to big firms and corporations. There is an opportunity for SMEs to participate and increase their share in the digital value chain.

Digitalise value chain for continuous improvement and development

Digitalisation efforts require a long-term approach to develop digital capabilities and transformation. The four digitalisation applications listed below cover a wide range of value chain functions, from supplying raw materials to production, to business core processes, and to government digital transformation; with the aim of enabling digital technologies to create more value.

1. Supply Chain Digitalisation
2. Industrial Digitalisation
3. Enterprise Digital Transformation
4. Government Digital Transformation

Productivity Value

1. Supply Chain Digitalisation to ensure productivity to meet the demand

Push digital technologies to form an integrated digital supply chain to pull the demand

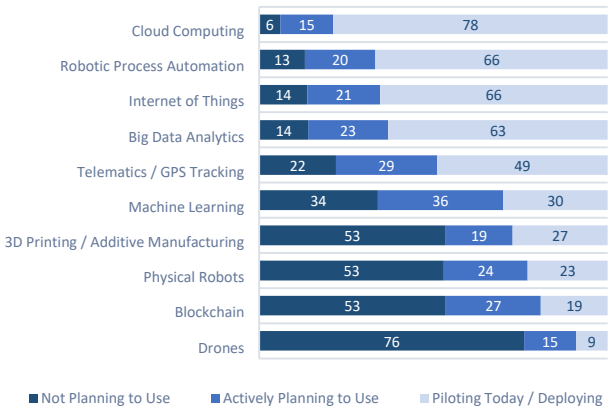
Industry 4.0 requires companies to rethink the way they design their supply chain. Several technologies have emerged that are altering traditional ways of working. The digitisation of the supply chain enables companies to address new requirements in both supply and demand.

67% companies are rethinking their supply chain in APAC, 52% globally

47% plan to change speed of automation
39% plan to change digital transformation

Source: EY

How organisations are using or planning to use the following technologies in their supply chain



Source: EY

KEY PRIORITIES

Supply chains can leverage on emerging digital supply chain business models and transform companies into a digital supply chain.

1. **Supply chain control tower** – to see the complete view of production, supplier, distribution, and customer to increase transparency.
2. **Data capturing and management** – information available to all supply chain members simultaneously to improve insights gathering and communication; a robust data ecosystem is required with the right players such as AI to provide solutions and capabilities for data capture, integration and processing.
3. **Integrated planning and execution** – to deliver the right product into the customer's hands as quickly as possible, but also to do so responsively and reliably, while increasing efficiency and cutting costs through automation.

CASE STUDIES

MISI MALAYSIA INSTITUTE FOR SUPPLY CHAIN INNOVATION

Malaysia Institute for Supply Chain Innovation (MISI)

MISI offers a Master's programme in supply chain management and logistics. MISI also conducts research and corporate outreach activities for both global and local firms operating in the Southeast Asia region.

IKEA

IKEA's Distribution Centre

A large-scale distribution centre has been set up by IKEA in Selangor, Malaysia to operate as the largest regional distribution centre in Asia-Pacific catering to Southeast Asian and Indian markets. The facility leverages on data-driven, robotic solutions with flexible software integration to assist their workflow automation to deliver products faster and provide steady supplies for the market.

Productivity Value

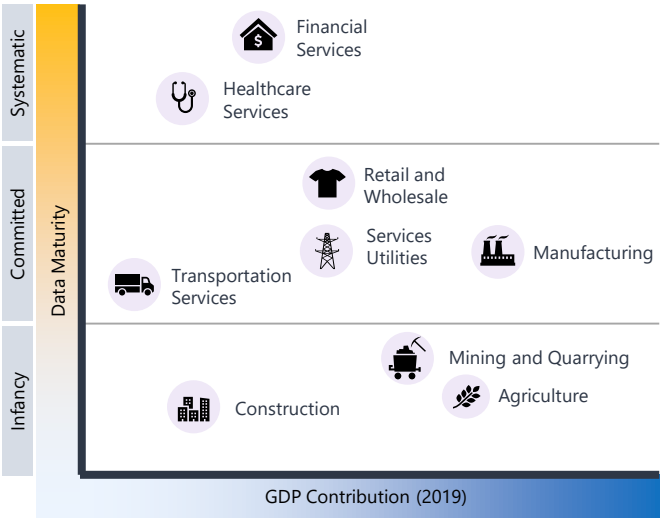
2. Industrial Digitalisation to increase production productivity

Establish the foundations for a digital transformation to capture Industry 4.0 opportunities

The industry needs to establish value drivers to support and benefit from digital technologies that come with Industry 4.0 Industrial Digitalisation, characterised by:

- More automation and robotic processing
- Cyber-physical systems, enabled by Industrial IoT
- A shift from a central industrial control system to one where smart products define the production steps
- Closed-loop data models and control systems
- Personalisation/customisation of products.

Malaysia data as base of digitalisation by industry



Sources: "Malaysia AI Blueprint 2019" by BIGIT; DOSM Malaysia Economic Statistics Review

CASE STUDIES

Malaysian Development Bank (BPMB) – Industry Digitalisation Transformation Fund

Funds to accelerate industry adoption of Industry 4.0 related technologies thereby increasing the contribution of the manufacturing sector to the national economy.

The Federation of Malaysian Manufacturers (FMM)

FMM has consistently led Malaysian manufacturers in spearheading the nation's growth and modernisation. Today, as the largest private sector economic organisation in Malaysia representing over 3,000 manufacturing and industrial service companies of varying sizes.

Sources: BPMB, FMM

KEY PRIORITIES

The use of modern control systems and embedment software systems enables new ways of production, value creation, and real-time optimisation. These value drivers would be key to capitalising on:

1. **Build Relevant Digital Capabilities** – Digitise production process, combine data, integrate systems and processes, and make decisions based on cross-functional information.
2. **Manage Data as a Valuable Asset** – Enable an information flow and to be integrated and shared across the value chain, from design to production, and to allow quick reactions and adaptations through the robust data ecosystem.
3. **Facilitate Collaboration** – Seek strategic partnership in the industry ecosystem, within or without the same industry to broaden the value chain.
4. **Ensure Cybersecurity** – Prioritise protection around key assets, integrate into core processes and safeguard technology.

Productivity Value

3. Enterprise Digital Transformation towards a productive business ecosystem

The use of modern control systems and embedment software systems enables new ways of production, value creation, and real-time optimisation. These value drivers would be key to capitalising on Malaysia's overall digital adoption is high but further efforts are needed to accelerate more digital adoption among businesses. More productive sectors and states are likely to use digital tools to supplement core business functions, such as banking, internal communication, customer service, and sales.

KEY PRIORITIES

Enterprises, especially SMEs, need to transform business processes and use digital technologies to improve business efficiency.

1. **Promote new agile ways of working and nurture a digital culture**
   New ways of working are essential for digital success, such as agile product development, test-and-learn methods that speed progress while keeping the focus on customers, and cross-functional teams that pool specific types of expertise.
2. **Giving a day-to-day business process a digital upgrade**
   Digitalising business processes and tools can empower employees to work in new ways and more efficiently.
   - Adopting digital tools to make information more accessible across the organisation, which more than doubles the likelihood of a successful transformation.
   - Implementing digital self-serve technologies for employees and business partners to use; transformation success is twice as likely when organisations do so.
   - Modifying standard operating procedures to include new technologies, increase in data-based decision making and in the visible use of interactive tools.

Business Support	Operational	Marketing and Sales	End-user Servicing
▪ Finance management tools ▪ HR management tools ▪ Technology and product development tools ▪ Procurement management tools	▪ Project management tools ▪ Process Automation solutions ▪ Workflow management tools ▪ Case management tools	▪ CRM and customer data analytics ▪ Digital performance marketing ▪ Sales and distribution management tools	▪ e-Commerce platforms ▪ e-Payment solutions ▪ Self-service portals ▪ Customer service solutions

CASE STUDIES

SMART Automation Grant (SAG)
Government support for SMEs by helping them to automate their business processes and move towards digitalisation.

SME Business Digitalisation Grant
Government support for SMEs to adopt digitalisation measures for their business operations.

High Tech & Green Facility
Facility provided by SME Bank to provide capital expenditure and working capital for SMEs in manufacturing, ICT, and green technology.

Digital Transformation Labs
Help companies to brainstorm on new ideas, business models, develop new products, and pilot the implementation plan.

Digital Xccelerator
A centralised touchpoint for business digitalisation that provides support for SMEs through digitalisation programmes, incentives and digital technology solutions.

100 Go Digital
A programme to excite and educate Malaysian businesses on digitalisation, focusing on digital adoption benefits.

Huawei Spark
The Huawei Spark Programme is a competition meant to incubate and accelerate startup growth. In 2022, it was held in conjunction with MDEC, TM, MRANTI, SIDEC, and Cyberview.

Sources: MDEC; BSN

Productivity Value

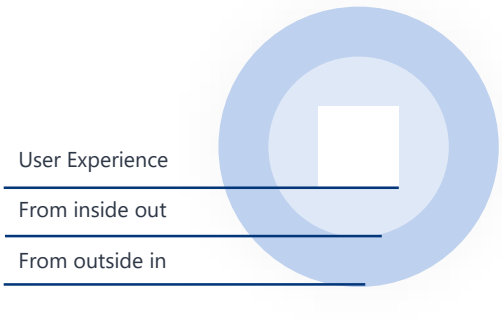
4. Government Digital Transformation towards a future-oriented governance

Digital transformation is now a public sector imperative to strengthen the nation's business and digital ecosystem and increase productivity

The Malaysian public sector is currently in the midst of digitalisation. Digital transformation is crucial to a future-oriented government and the digital value chain. There are five critical areas where governments can harness digital technologies to create better outcomes for citizens:

- Understand their citizens better for continuous improvement to achieve better outcomes
- Provide services more effectively and efficiently
- Find new solutions to policy challenges
- Engage with external partners to develop new delivery models
- Commercialise some public services and develop fresh sources of revenue

To build a public sector that is fit for the future, the Government must reinvent itself. Digital transformation is not just about new technologies, but requires an overhaul of organisational structures, governance, work processes, culture and mindset. The Malaysian Government has integrated these critical areas into the first key strategic thrust in the Malaysia Digital Economy Blueprint, which is to drive digital transformation in the public sector.



KEY PRIORITIES

1. **User Experience** – understand citizens and private sector better, leverage on open data to gather insights, put consumer at the centre of the heart for decision making, integrate services and user touchpoints to provide a seamless value chain.
2. **Digital transformation from inside out** – review overhaul of organisational structures, work processes, culture and mindset, and adopt digital technology and way of working to increase the return on public investment.
3. **Digital transformation from outside in** – improve digital services to make it easy and intuitive to use, such as self-service portal and mobile apps to make more services available 24/7 online and using feedback to continually improve services.

CASE STUDIES

MAMPU

Government Service Delivery Digitalisation Plan in boosting the level of success and competitiveness of the country.

Australia's Tech Future – Improving the digital experience

Transform government services and improving online services delivery to address the gap in service experience between the private and public sector.

UK Customer-centric Government

UK was doing everything they can to meet Central Government's deadlines, whereby 100% of the their services are required to be online and accessible to the public by 2005.

Sources: MAMPU; Australia's Tech Future; MyCustomer.com

Innovation Value

Cultivate local innovation and strengthen linkages

Identifying growth opportunities through innovating digital products and services

Innovation is critical to growth, particularly as the speed of business cycles continues to accelerate. This section will focus on creating innovation value through cultivating disruptive business models, innovative digital products and services, reinforcement collaborations, towards a cooperative and competitive ecosystem.

Innovation Capabilities Index

Malaysia	Singapore	Thailand	Indonesia	Philippines
Interaction, Diversity and Collaboration global rank				
24th	1st	47th	42nd	40th
Research and Development Expenditure global rank				
39th	21st	56th	83rd	87th
Commercialisation and Buying Sophistication global rank				
40th	10th	52nd	91st	87th

Source: The Global Competitiveness Report 2019
Notes: The latest version of the Global Competitiveness Report (2020) has no comparable country indicators since it is a global review on COVID-19.

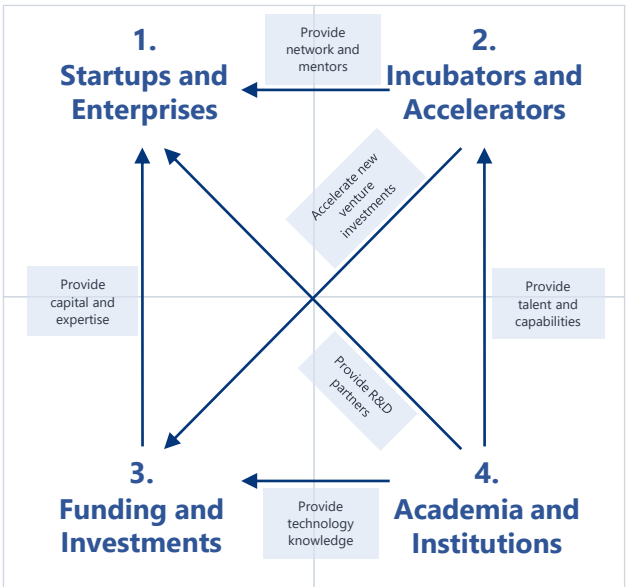
Integrated network with robust collaborations among innovators, funders and enablers

Innovation is one of the major themes of Malaysia's national priorities. A collaborative innovative ecosystem is key to ensure sustainable economic growth. Although Malaysia has robust innovation bodies, initiatives and incentives, there are still overlaps. In order to create sustainable Innovative Value, linkages between different players must be strengthened and integrated. Malaysia has merged Technology Park Malaysia and the Malaysian Global Innovation and Creativity Centre (MaGIC) into one entity – the Malaysian Research Accelerator for Technology and Innovation (MRANTI). Improving coordination between the innovation and entrepreneurship activities of MDEC, MRANTI, and Cradle could also help maximise returns and improve the innovation ecosystem.

KEY PRIORITIES

To form an integrated network with robust collaborations among innovators, funders and enablers, Malaysia must:

- **Develop the innovation ecosystem model** – more holistic, collaborative and sustainable that meets the nation digital economic growth target.
- **Have a strong pipeline of profitable innovations** – disruptive business models, digital products and services that meets the rising customer expectations and needs.
- **Foster an environment of innovation** – with the right foundation of investment, adaptable and enabling regulation, and top digital talent to support the ecosystem.



Innovation Value

1. Malaysia to be a startup epicentre in ASEAN

Nurture unicorns, foster disruptive startups and entrepreneurship

Malaysia has a vibrant and competitive startup landscape and entrepreneurship spirit, and has shown impressive entrepreneurial talent, producing some of ASEAN's most recognisable digital startups. This is enabled by supportive public sector grants, capability building initiatives and overall digital technology maturity.

Startups and entrepreneurship are disruptors and catalysts of a competitive business ecosystem and drivers of industry productivity. They provide new jobs and in-demand skillsets. Successful startups also attract foreign direct investments (FDI) from international investors to spur economic growth.

Malaysia Startup Ecosystem Landscape

Startup Ecosystem

2nd

in ASEAN, 21st globally

Startup Ecosystem Value

$16.1 billion

Global average $10.5 billion

Sub-sector Strengths

Gaming, FinTech, e-Commerce

Source: The Global Startup Ecosystem Report 2021

KEY PRIORITIES

A coordinated approach involving the public sector is required for Malaysia to create an environment that fosters innovation and entrepreneurship. Malaysia would need to constantly introduce new schemes for startups and tap into homegrown service providers to assist them in their growth and expansion.

1. **Tax Exemption Scheme** for startups to foster entrepreneurship and for startups to establish a base.
2. **Tax Deduction for International Expansion** – on expenditures made by a company for supported market expansion.
3. **Government linked company (GLC)s-Startup Partnership** – encourage, promote and even incentivise government-linked companies (GLC) to procure outsourcing services from startups.
4. **Capabilities Development** – upgrading essential capabilities for startup and enterprise innovation such as design thinking, tech development, CX and UX design, and digital marketing.

CASE STUDIES

Malaysia Digital Hub

Offer opportunities to startups by providing digital co-working space with focus on providing high-speed broadband connectivity, funding and facilitation opportunities.

FinTech Booster Programme

The FinTech Booster programme, developed in collaboration with Bank Negara Malaysia and MDEC, to support the growth and development of FinTech facilitation companies in Malaysia.

Malaysia Tech Entrepreneur Programme

Government support via Malaysia Digital Hub and a dynamic growth startup ecosystem for new or existing entrepreneurs.

National Technology and Innovation Sandbox

Facility that enables researchers, innovators, startups and high-tech entrepreneurs to test products, services, existing business models and delivery mechanisms in a live environment.

Innovation Value

2. Sourcing for innovation funding and entrepreneurship

Inject risk and growth capital, and create an integrated funding value chain

Innovation plays a critical role in economic growth. Well-functioning and sophisticated financial markets are important in funding innovation.

Digital entrepreneurship in Malaysia is constrained by funding shortages

Startups still lack access to the private capital they need to thrive. The shortage of funding is more severe during the early stages of a startup. Malaysia hosts few private sector venture capital firms, leaving firms to rely largely on funding from Singapore or USA when they graduate from seed-stage funding provided by the Government. This undermines the local market and deprives entrepreneurs of the expertise that typically comes with venture capital.

Startup Funding Values

Startup Ecosystem Value	Seed Funding	Early Stage Funding	Series A
$72 billion	$215.4k	$198 million	$3.3 million
Global average $28.6 billion	Global average $671k	Global average $687 million	Global average $4.7 million

Source: The Global Startup Ecosystem Report 2021

KEY PRIORITIES

To address the venture capital (VC) and funding shortage, especially early-stage funding, Malaysia needs to cultivate local venture capital, and offer incentives to attract global investors that will ultimately create a strong and vibrant funding value chain.

1. **Inject capital and grants for early-stage startups** – increase the rate of new seed and Series A funding to increase the 'bigger ticket' deals for later stage VCs and global investors.
2. **Design sector specific incentives and grants** such as manufacturing, R&D and agritech.
3. **Nurture local enterprises to venture capital** – provide relevant trainings for fund management, raising fund, portfolio management and exit strategy.
4. **Increase tax incentives to attract global venture capital** – to strengthen the local growth capital.
5. **Create a chain of investment** – consolidate funding and ensure the fund availability from early stage to growth stage, as long as the startup KPIs are met.

CASE STUDIES

PIKOM SEA Dragon Venture Platform

Aimed at connecting scale up companies in Malaysia and across the ASEAN region with global venture capitalists, corporate investors and high net-worth individuals. It is a week of mentoring, pitching, and meeting with venture capitalists, enabling entrepreneurs to step up their chances of securing international funding for their scale ups.

Cradle Fund

Cradle is the Government's primary mechanism to provide funding to Malaysian entrepreneurs at the seed stage to support potential and high-growth technology startups. Cradle provides pre-seed and seed funding, coaching programmes for entrepreneurs, and initiatives for more early- stage investments.

Sources: PIKOM; Cradle

Innovation Value

3. Accelerate the early-stage startups and enterprises

Tackling startup roadblocks and accelerating innovative startup growth

Accelerators and incubators offer entrepreneurs good opportunities early in their development. Entrepreneurs get the necessary help to quickly grow their business and improve their chances of attracting a top venture capital firm and angel investors.

Several incubators and accelerators in Malaysia provide support in several areas:

- Startup connectedness – organising networking events and meetups in the ecosystem
- Talent access – connect startups to experts for outsourcing and collaboration
- Market reach – advisory in commercialisation, local reach and globalisation
- Knowledge sharing – upskill entrepreneurs on necessary skills such as branding and marketing

KEY PRIORITIES

Startups often struggle to find clients and investors at the beginning of their journey, when it is most needed. In such instances, accelerators and incubators help startups to better understand the needs of their clients and investors and get funds through contacts in the investment community.

1. **Facilitate access to corporate clients and business to business (B2B) partnership** – pull together corporates and business connections that might require services and products offered by startups.
2. **Personalised mentorship and acceleration programme** – systematically aligned to the stage of startup, ensuring availability of a broad menu of mentoring menu tailored to its needs to support and finance upgrading.
3. **Boost startup networking events** – similar to Echelon Asia Summit, Rise, Saastock Asia, and CU Asia, to drive global mindset; solutions that addresses ASEAN needs vs MY needs alone
4. **Invitation of global incubators and accelerators** – A3 Global Collider and Y combinator to foster entrepreneurship

CASE STUDIES

Alpha Startups Digital Accelerator (ASDA) by 1337 Ventures and MDEC

The digital accelerator is an initiative to help up-and-coming new startups, as well as those unsure about financial or job stability and would like to take charge of their own fate via entrepreneurship. The programme will help equip participants with the skills needed to successfully run their own business. Rather than be restless within the confines of home, individuals can seize the opportunity and raise their productivity.

MRANTI to nurture entrepreneurs who are seeking support and entry to the ASEAN market

MRANTI offers numerous programmes, including training to help entrepreneurs, entrepreneurship conferences, accreditation programmes, Global Accelerator Programme, and a partnership with Stanford University's innovation and entrepreneurship programme.

Source: Digital News Asia, MRANTI

Innovation Value

4. Academia to lead research and innovation development

Academia (universities and research institutes) can assist businesses to launch successfully and contribute to the local economy

Academia-enterprise collaborations are a powerful driver of innovation and entrepreneurship activity. For academia, links with industry are important as a source of funding, knowledge, and information on the latest technology developments. For firms, links with academia are important as they can tap scientists and researchers to expand their innovation initiatives. However, establishing collaboration and links between the two parties remains a challenge, although some progress has been made.

KEY PRIORITIES

The capability to innovate and bring innovation successfully to the market will be a crucial determinant of global competitiveness over the next decade. Academia needs to lead research and innovation development and accelerate its integration to the business ecosystem.

1. Provide lab space and resources, including graduate students, for product research, development, and design. These measures are related to the issue of academia supporting their communities by making academia resources available at favourable rates for startup research requirements.
2. Promote collaboration within the university, institutions and business communities by working together to produce prototypes or minimum viable products for market validation.
3. Provide subsidised collaborative space for new startups to develop their businesses in an atmosphere designed to promote business success such as an incubator or business park.
4. Strengthen academia-industry links that can operate in a liberal environment with minimal government intervention. With liberal regulations, universities should prioritise research with commercialisation value.

CASE STUDIES

MOSTI

Ministry of Science, Technology and Innovation

MOSTI works with respective academia in gathering STI related data via National Science and Technology Information Centre (MASTIC), and to identify policy interventions backed by scientific data to address current socio-economic challenges.

Academia is a key stakeholder involved in implementing/being a recipient of MOSTI's initiatives such as Malaysia Commercialisation Year (MCY) and MOSTI R&D Fund.

i-Connect initiative

RM16 million would be allocated as grants for R&D under the I-Connect initiative, a collaborative platform for researchers, industry, the Government and NGOs.

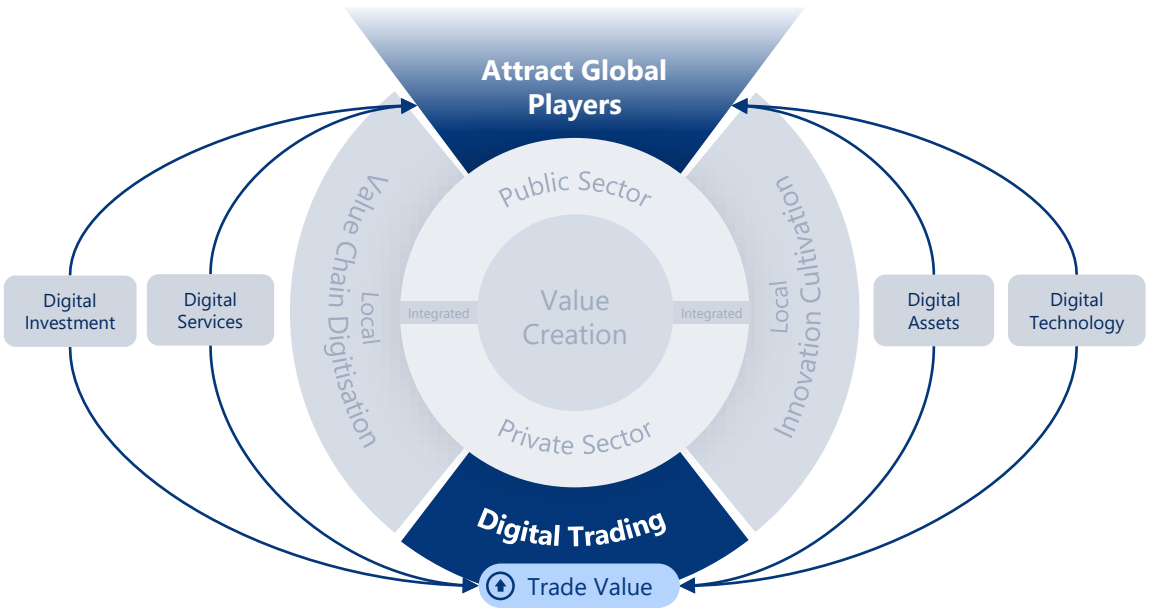
Trade Value

Integrating a productive and innovative ecosystem into the ASEAN value chain

Digital globalisation has opened the door for small companies and startups. In Malaysia, countless small and mid-sized enterprises have turned into exporters by joining e-Commerce marketplaces such as Lazada, Zalora, and Shopee. Trading flows of all types support growth by raising productivity. Data flows amplify this effect by broadening participation and creating more efficient markets.

The objective of this section is to facilitate the seamless movement of digital assets, services, investments, technologies and knowledge in Malaysia in order to enhance ASEAN's digital trading networks, as well as to attract global players and investment into the ecosystem.

Integrated, Future-ready Digital Ecosystem



The key elements of a highly integrated digital trading includes:

1. Expand integration into ASEAN value chains
2. Leverage on and accelerate digital trading channels
3. Create differentiation to strengthen Malaysia positioning
4. Encourage a conducive investment environment

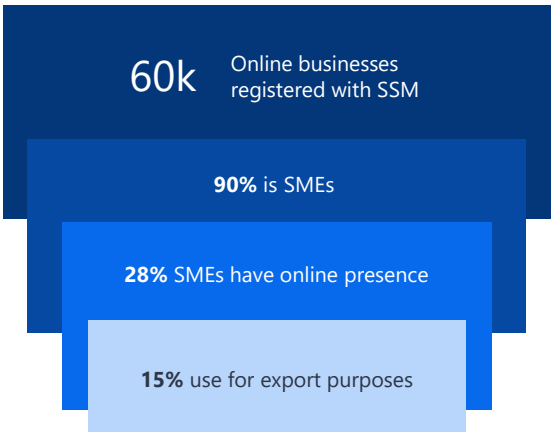
Trade Value

1. Expand integration into ASEAN value chains

Integrate ASEAN and global digital trading value chains to create value for Malaysia's digital economy

Malaysia is boosting integration of its domestic market while keeping markets open to strengthen partnerships with economies around the world.

The free flow of products and services has long been an important aim of Malaysia's economic growth. More collaboration and trust in digital trading within Malaysia and external parties will continue to grow. Malaysia needs to enhance its digital production pipeline and integrate trading to ASEAN networks, to facilitate industrial development, innovation, and competition.



Source: Free Malaysia Today

KEY PRIORITIES

Malaysia needs to be a more proactive player in ASEAN and global value chains to shape the future digital ecosystem.

1. **Digital and technology commercialisation** – Promote freer flow of digital products, services and investment in the region. Create trade facilitation initiatives focusing on both digital imports and exports.
2. **Promote participation in global value chains** – the development and strengthening of regional value chains is key to enhance ASEAN positioning.
3. **Enhance collaboration capabilities** – host commercial networking, regional branding, and other joint ASEAN business and marketing activities.
4. **Developing new trade opportunities through digital channels** – invite global e-Commerce platform and marketplace players, collaborate and tap into their markets, and integrate with local e-Payment channels and methods.

CASE STUDIES

Singapore to lead digital trade efforts and shape new digital trade architecture

Singapore is actively partnering with like-minded countries and organisations in digital trade efforts, in order to stay nimble in its international trade strategy.

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Trade Value

2. Leverage on and accelerate digital trading channels

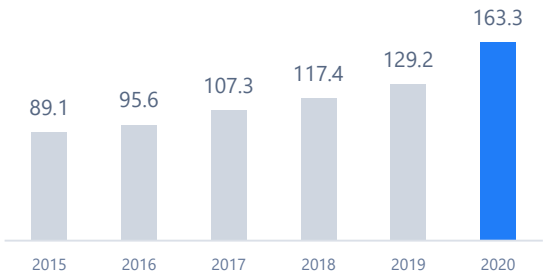
e-Commerce

Malaysia's strong cross-border and sector transactions

Numerous leading regional e-Commerce players, including Alibaba Group, Shopee, Lazada and Zalora, have established their regional distribution centres, e-fulfilment hubs and distribution warehouses in Malaysia.

Malaysia's digital economy has grown exponentially to nearly RM320 billion in 2020, contributing about one-fifth or 22.6% of the country's GDP (14.2% in Gross Value Added ICT, and 8.4% for e-commerce of other industries). The annual percentage change of e-commerce to GDP was 26.5% from 2019 to 2020, accelerated by COVID-19.

Malaysia's gross value added of e-commerce to GDP (RM billion)



Sources: DOSM; Digital Economy 2021.

1. **Invite global e-Commerce players to increase cross-border spending** – invitation of sector specific strong e-Commerce players to open up the new market transactions
2. **Harmonise consumer rights and protection laws** – To ensure businesses improve their customer experience from shopping to fulfilment, and consumer protection policy such as return and refund policies.
3. **Promote adoption and integration to e-Payment** – shifting lifestyle and online expenditure from bank transfers, credit card, and cash-on-deliver to e-Wallet payment.

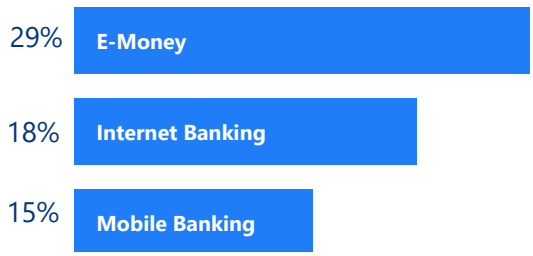
E-Payment

We have the right enabling environment to boost e-Payment

Developing an inclusive digital payment ecosystem is essential for providing basic financial services to those lacking access to banking services or other formal financial services.

In the next five years, digital payments are expected to record double-digit five-year CAGRs across countries, with Malaysia expected to grow by 20.2% CAGR from 2017 to 2021, due to smartphone penetration and internet access. E-payments in 2020 grew, driven by online and contactless transactions.

Consumer preferred payment methods



Source: FinTech Malaysia Report 2021

1. **Increase e-Wallet usage and customer wallet share** – extend financial access to the unbanked, enabling them to store value and transfer funds conveniently and safely; online and mobile payments open doors to SMEs to engage in e-Commerce and cross-border trade, ultimately expanding their market reach.
2. **Decrease the reliance on cash-on-delivery** to pay for online purchases for greater adoption of digital payments
3. **Gain trust with standardisation and security-** Account holders are less likely to use digital means to access their accounts in Southeast Asian countries than globally.
4. **Revisit revenue model** – They are 46 licensed e-Wallet players in Malaysia, however most of them are not profitable, yet.

Trade Value

3. Create differentiation to strengthen Malaysia's positioning in ASEAN

The movement of intellectual property and data underpins digital trade. IP and data are digital assets that can themselves be traded and are a means to participate in global value chains.

Trading of Digital IP

Digital Creative Content

Malaysia is a leading regional player in gaming, animation and visual effects. Positioning Malaysia as a capital for digital creative content and enhance intellectual property commercialisation.

1. Talent – upskilling and enhancing capacity by broadening access to the industry
2. Investment – boost funding for R&D to increase quality and competitiveness
3. IP Commercialisation – Catalysing IP commercialisation to grow size and scope
4. Empowering ecosystem – improve industry networking and awareness especially to the youth

Trading of Digital Assets

Digital Data and Centres

Data is central to the digital economy. Transmitting data across sectors and even borders is central of integrated ecosystem.

1. Use of data – to be measured, collected and reported, and analysed to meet customer and market demand
2. Open data – make data available that generates more economic value than traditional flows of traded goods
3. Data sharing – cross-sector and border collaboration and leverage on local data centres

Trading of Digital Services

Development, Digital Design and Digital Marketing

Malaysia shall recognise essential digital services such as IT development, digital design and digital marketing as part of Global Business Services for an end-to-end service value chain.

1. Position as the Centre of Excellence – leverage of substantial digital marketing agency industry that provides award wining works for regional firms
2. Promote Customer Experience Office (CXO) – into C-suite as Harvard Business Review makes the case that every company should have one in this digital age.
3. Build enterprise in-house capabilities and integrate to these digital services to core business process

Trading of Digital Technology

Everything As A Service

Malaysia shall recognise Everything As A Service (XaaS), such as digital platform (PaaS), software (SaaS) and technologies (CaaS) to deliver personalised and customised values to customers as a service via online channels.

1. Strengthen digital product development and startup pipeline to solve complex business and customer problems
2. Commercialise digital product as a service to serve ASEAN and global market. Expand, convert and develop the digital products to revenue models that are personalised to business needs and for commercialisation purposes.

Trade Value

4. Encourage a conducive investment environment

Investor sentiment

"3 reasons why Malaysian businesses are not reaping the benefits of technology"

by IDC ASEAN commissioned by Maxis

1. **Many initiatives only have tactical plans** – many organisations may yet to have envisioned how technology can reorient the organisation to become more agile, innovative, adaptative and customer-centric in a long term, and that required continuous development of digital capabilities and transformation.
2. **Development happens in silo** – the setup of organisation systems, digital infrastructure development, digital transformation initiatives and project teams are disjointed, which limits productivity and growth.
3. **Performance monitoring is outdated** – Traditional IT measurement, with its long-term focus on efficiency metrics for managing infrastructure, applications, and components, is no longer adequate.

"Policymakers and leaders must act now"

by Startup Genome

1. **Startups struggling post COVID-19** – While more established startups may have lots of cash on hand or have been in the press for "pivoting successfully" during the COVID-19 crisis, many startups are struggling.
2. **Startups can improve economy recovery** – For many years, startup ecosystems around the globe have proven to drive productivity a good engine for jobs.
3. **Startups helps post-crisis economies remain competitive** – startups provide competition to challenge players in virtually every industry. Without startups, technology, finance, healthcare, and other fields would be stagnant, and enterprises of all sizes will have less innovation.

"Continue investment to enhance Malaysia digital agenda"

by a leading global infrastructure service provider

Huawei has been working closely with Malaysia to strengthen the digital ecosystem, and eager to continue its investment to enhance Malaysia's telecommunication sector, share knowledge and solutions.

The development of Malaysia's digital infrastructure and industry modernisation is expected to pick up in the coming years to participate in this competitive market.

"Early-stage funding is limited, which cascades down to the overall investment deals availability"

by 1337 Ventures

1. Insufficient early-stage funding/grants creates a barrier to entrepreneurship and innovation cultivation
2. This barrier cascade down to the limited deals for later stage local and foreign VCs, hence the insufficient growth capital availability.
3. Government-led procurement programme for GLCs to use startup's services and groom them to unicorn.

Sources: Maxis Business; The Global Startup Ecosystem Report 2020; Interview with 1337 Ventures

Malaysia to elevate its investment measures

As investment increases, the capacity of an economy to produce more digital products and services also increases, driving digital economic growth. Investment has a critical role in:

- **Productivity**, including through the transfer of talent, knowledge, and capacity relating to digitalisation.
- **Industrialisation** and drive the region to become a major production base to form a global supply chain and production network
- **Innovation** with import and domestic cultivation of new and emerging digital technology, skillset, and R&D

The COVID-19 crisis has dramatically impacted the global ecosystem, resulting in disruptions for startups and inflows of foreign direct investment (FDI). FDI inflows to developing countries are expected to drop even more than the global average due to the pandemic.

The Malaysian Government has introduced numerous initiatives to position Malaysia as a competitive choice to attract the relocation of production bases here.

CASE STUDIES

penjana

Short-Term Economic Recovery Plan (PENJANA)

To encourage foreign companies to relocate their operations to Malaysia. The measures include a zero percent tax rate for a period of 10 years for capital investments of RM300 million to RM500 million, and a zero percent tax rate for a period of 15 years for capital investments that exceed RM500 million.

PENJANA Kapital

Penjana Kapital administers the Dana Penjana Nasional (National Penjana Fund), a RM600 million investment fund set up by the Government of Malaysia for venture capital firms to invest in startups. This amount will be matched on a 1:1 basis by foreign investment institutions to attract investors. An allocation of RM1.2 billion will be made available to enhance the digitalisation and automation of Malaysian businesses and at the same time revitalise the Malaysian economy.

High Impact Fund

A matching grant to attract investments of selected companies to locate their projects in Malaysia in order to compete with other countries in the region and more developed economies by offering competitive incentives.

Domestic Investment Strategic Fund (DISF)

A matching grant to accelerate the shift of Malaysian-owned companies in targeted industries to higher value added, high technology, knowledge intensive and innovation-based industries.[2]

Source: PENJANA. MIDA

Improve attractiveness as a global investment destination to grow Malaysia's competitiveness and steady investment inflows

KEY PRIORITIES

Create a funding value chain from seed to growth stage

1. **Inject capital quickly to save startups** that are at risk of closing down.
2. **Inject capital to increase early-stage funding**, to ensure these types of investments do not drop as dramatically as they did during the 2008 recession and to ensure we do not lose an entire generation of founders.
3. **Laying a foundation to attract growth funds** – achieving both of goals above will lead to startups having the opportunity to close their next round of funding when things stabilise, that will attract more foreign VCs and investors.

ASEAN Financial System performance index

Malaysia	Singapore	Thailand	Indonesia	Philippines
Financing SMEs				
8th	6th	29th	31st	71st
Venture Capital Availability				
9th	6th	34th	37th	44th

Source: The Global Competitiveness Index Report 2019

KEY PRIORITIES

Enhance large investments through establishing free and open Foreign Direct Investments (FDIs) and Domestic Direct Investments (DDIs)

1. **Investment policies** must also be geared towards addressing emerging investment trends, particularly in addressing the sustainability dimension of investment
2. **Eliminate/improve investment impediments** and restrictions
3. **Enhance domestic and even foreign investment fund** – to revitalise subdued private investment growth

Malaysia Digital Investment, *RM, Bil*

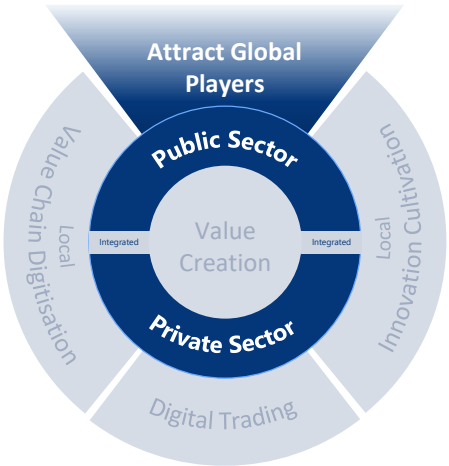
Type	2019	2020	2021
FDI	**22.93**	**24.30**	**26.95**
DDI	**15.41**	**14.80**	**18.73**
Total	**38.34**	**39.10**	**45.68**

Source MDEC

Productivity Value | Innovation Value | Trade Value

Integrated partnerships are critical to the Digital Ecosystem

Ecosystem relationships take many forms, such as alliances, co-branding and other collaborative structures. Establishing a strong integrated partnership between public and private sectors stimulates the dynamism and growth of the digital ecosystem. These relationships are designed to create value that cannot be achieved by a single entity alone.



Public Sector

Ministry	Agency
Regulator	Policy Maker

Create a supportive digital ecosystem for enterprises and innovators to thrive

1. **Foster ease of doing business** – cultivate investment environment and incentive accessibility to attract global investments to bring in new technology, talent and skills.
2. **Foster collaboration among businesses and sectors** – new types of partnerships that can jump-start new growth, with win-win partnership facilitation and incentives.
3. **Foster dynamic and competitive ecosystem** – strengthen protections of consumer, intellectual property and competition policies enablement.

Private Sector

MNC	Large Enterprise
Micro, Small and Medium Enterprise	Startup
Industry Association	

Create a seamless value chain to meet the rising consumer expectations

1. **Utilise available programmes and incentives** – to conduct necessary R&D activities.
2. **Continuous adaptation and future-ready** – Ongoing innovation and continuous improvement to ensure resilience and stayed relevant.
3. **Global mindset** – ensure cross-sector and cross-border collaboration, commercialise and scale business to global market by exploring new digital channels for trading and distributions.

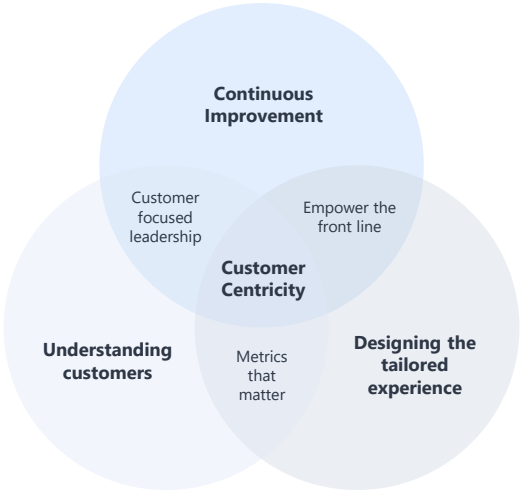
Value creation driven by customer-centricity

Customer-centricity is the ultimate goal that underpins the ability of strong digital ecosystems to compete in a borderless global economy.

As technologies and competition emerge, an increasing number of businesses and industries will converge to broader, deeper and integrated digital ecosystems.

Why does customer-centricity matter? A world of digital ecosystems will be highly customer-centric, because:

1. **Consumer expectations are rising and shifting** – Consumers demand for an end-to-end experience for a wide range of products and services seamlessly without leaving the ecosystem is reflected in the leading companies.
2. **Consumer demand is what businesses and investors look for** – What is the serviceable and obtainable market; how is the digital adoption; and what is the consumer preferences and demands, buying power and sophistication.
3. **To be innovative is to be people-centric** – In the digital age is no longer about pushing one-size fits all products, but rather pulling and understand customer's preferences and needs, and offer personalised solutions.
4. **Success of digital transformation is tied to customer experience** – That emphasis will continue to drive business investments in digital transformation.



KEY PRIORITIES

The cross-functional nature of effective customer- experience is reflected in smart organisation governance (public and private).

1. **Customer-centric organisation for continuous improvement** – To establish a truly digital native nation, Malaysia must be people-focused and deliver integrated value chain and innovations that meet consumers' needs and satisfaction.
2. **Understanding customers by using data to connect the dots** – Linking all possible customer data to predict the needs of customers before they are articulated. The more an organisation knows about its customers, the better able it is to offer an integrated and end-to-end digital experience.
3. **Designing the tailored experience value chain** – shifting from the product-centric approach to customer-centric mindset, to focus on designing a tailored end-to-end value chain that meets customers' desires and demands for sustainable and adaptable growth.

CASE STUDIES

Forbes – Customer Experience is one of the top 10 most important digital transformation elements

As digital transformation success is intimately tied to user and customer experience, that emphasis will continue to drive business investments in digital transformation.

Source: Forbes

Summary

An integrated and future-ready ASEAN digital ecosystem with a wider reach and partnerships spurs the development and growth of the digital economy

An integrated digital ecosystem consists of diverse players with strong collaboration mechanisms that provide a holistic and seamless value chain. Challenges in every part of the digital ecosystem have intensified the importance of value creation, and the focus now should be on creating long-term values that boost sustainable digital economy growth, through Productivity Value, Innovation Value and Trade Value.

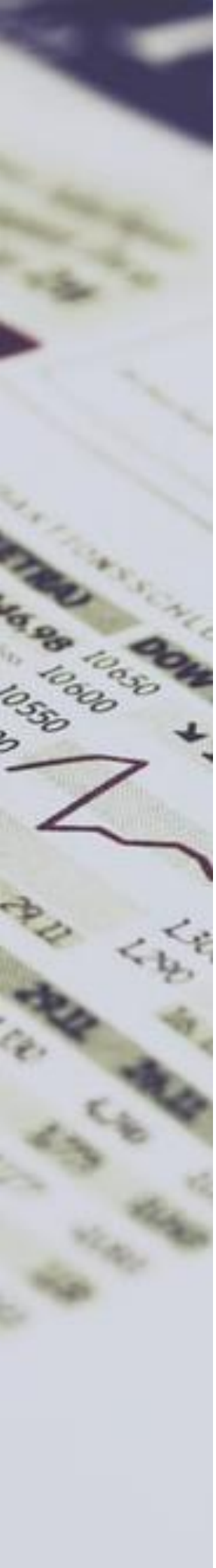
Stakeholders in all sectors and industries play critical roles in value creation to compete in a world of digital ecosystems. It is important for all stakeholders to collaborate and strengthen partnership linkages, avoid overlaps, and foster an enabling and competitive environment to attract global investments and players to advance the nation's development.

This is made possible by strengthening our local ecosystem – digitalising the value chain, cultivating innovation, and enabling a conducive digital trading and investment environment that meets customers' (business users, end-customers and citizens) demand. These boost attractiveness for global investors and players.

Malaysia has a strong digital foundation and is well-positioned to reach out to a wider range of partners, enabling more scope for digital technology, innovation and investment.

	Accelerate	Institutionalise	Develop	Review
Leverage	◊ Transform local value chains such as supply chains and industrial digitalisation ◊ Enterprise and government to accelerate digital transformation , adoption of business tools, and create long-term value creation Δ Create a chain of investments, from injecting early stage funding and grants, to attracting global VCs for later stage deals ◊ Broaden and deepen digital trading integration to ASEAN, leverage on e-Commerce and e-Payment channels ◊ Integrated partnerships between public and private sectors	Δ Promote and incentivise GLCs to procure services from homegrown startups Δ Develop holistic innovation ecosystem model with stronger linkages	◊ Nurture local enterprises to venture capital Δ Design sector specific incentives and grants	Δ Tax incentives schemes for startups such as tax exemption, and deduction for international expansion Δ Encourage conducive investment environment and establish a more open FDIs and DDIs
Differentiate	◊ Create digital trading differentiations to strengthen Malaysia's positioning ◊ Customer-centricity to drive long-term value creation: Productivity Value, Innovation Value, and Trade Value			

Legend: Δ Regulations and Policies ◊ Investment



CHAPTER 7

Digital Economy that is continuously growing and sustainable

Chapter Overview:

This chapter elaborates how the outcomes from the four Building Blocks in the previous chapters, will contribute to:

- Economy that is truly digital through adoption
- Economy that is ever evolving through innovation
- Economy with leading position in ASEAN
- Impact of the digital economy and spillovers

CHAPTER 7

Digital Economy that is continuously growing and sustainable

> *"The activities that involve production, innovation and consumption of digital technologies by individuals, businesses and government, contributing to the growth of economy and society*

Conceptualising the Digital Economy in Malaysia and its main stakeholders

Digital economy comprises activities that involve production, innovation and consumption of digital technologies by individuals, businesses and government, contributing to the growth of economy and society. These activities include the manufacturing of digital components and devices, and trade transactions through digital media across public and private sectors.

Digital economy has been a key input in Malaysia's economic growth. Malaysia's digital economy is currently estimated to be worth around US$71 billion, equivalent to 22.6% of Malaysia's gross domestic product (GDP).

With an average annual growth of 8% in the digital economy, Malaysia has emerged as a digitally mature country in the region. Malaysia continues to establish itself as a digitally enabled economy that leverages on its substantial digital and social infrastructure.

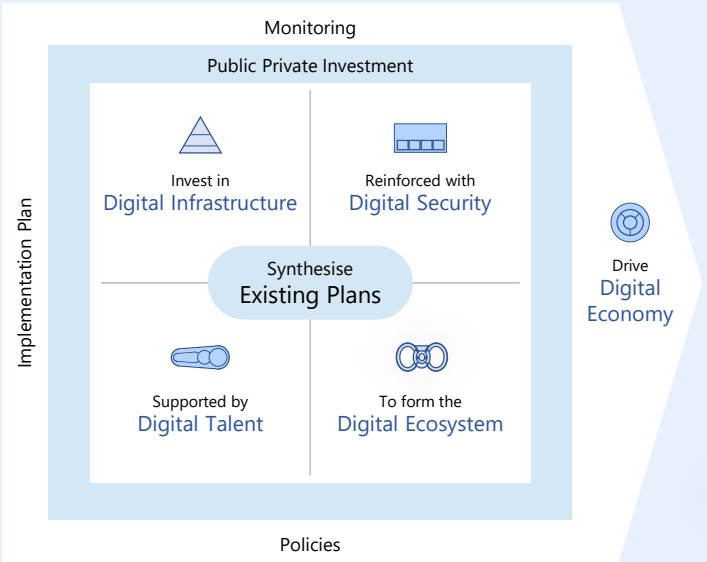
Driving the outcomes of the Building Blocks towards increased digital activities, for enhanced wealth creation, quality of life, productivity to create value for an economy that is truly digital, ever evolving and enables a leading position.

US$ 71 billion	Grown to US$71 billion (RM320 billion) in 2020
22.6%	Digital economy contribution to overall Malaysian GDP (2020)
8.5%	Annual average growth of digital economy in Malaysia from 2015-2020

Sources: DOSM; Digital Economy 2021

Framing the Digital Economy for continuous expansion

Malaysia can strengthen its digital economy further by making it more resilient and competitive through digital infrastructure, security, talent and ecosystem. These areas focus on enhancing the nation's digital capabilities to create value through digital technologies and adoption, spurring innovation, create job opportunities and contribute in sustainable economic growth.



Build scalable and future-proofed infrastructure to enable acceleration of strategic priorities

Ensure policies, governance and risk management to drive innovation

Upskill and right-skill talent to meet and sustain the increasing demands of digital growth

Build a cohesive digital value chain to cultivate collaboration and create market competitiveness

Changes in these areas will bring positive outcomes for the stakeholders of the digital economy. Expected outcomes are:

Public Sector

- Accelerate public sector digitalisation
- Improve data optimisation through better open data policies
- Develop more digitally skilled talent in public sector
- Improve living condition of citizens through digital adoption

Private Sector

- Creating level playing field for businesses regardless of size
- Increase in productivity and efficiency while minimising cost and risk
- Facilitate predictive decision making through intelligence and insights
- Innovative approach to transform business processes and applications to generate new revenue

Citizens/Consumers

- Increase confidence in conducting digital transactions
- Increase participation in digital economy from all citizens across digital divide
- Increase digital literacy and competencies in workforce and citizens

Digital Economy that is continuously growing

Even with the tenacious growth of the digital economy in Malaysia in the past, more actions need to be taken to create further value and a digital economy that is truly digital, continuously evolving and leading through strong positioning in ASEAN.

Economy that is truly digital

with strong digital adoption across businesses and citizens in driving its growth

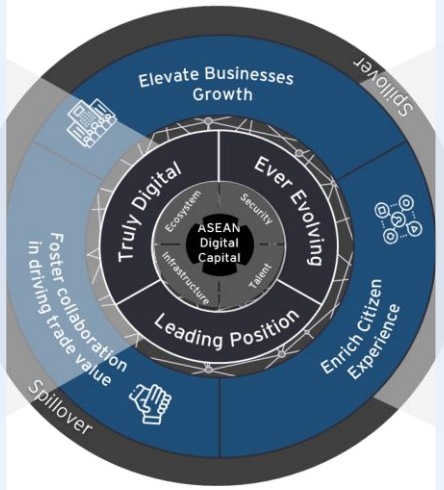
Economy that is ever evolving

with continuous innovation through industry transformation in driving productivity and efficiency

Economy with leading position

with strengthening Malaysia positioning in ASEAN through its competitive advantage

...by leveraging on digital infrastructure, security, talent and the integrated ecosystem



Elevate business growth

Driving business productivity, efficiency and marketability through technology and insights

Productivity Value

Foster collaboration in driving trade value

Driving trade value through public and private sector collaborative innovation

Innovation Value | Trade Value

Enrich citizens' experience

Improve social value through better employability and introduction of technology in daily lives

Social Value

Economy that is truly digital

Enabled by strong digital adoption across businesses and citizens of Malaysia in driving its growth.

Drive businesses digitalisation across industries to increase productivity and efficiency

MSMEs in Malaysia represent 97.4% of total enterprises.

Whilst larger companies have invested in digitalisation, SMEs are increasingly scaling up their technology adoption. According to an SME engagement survey, 62% of SMEs are leveraging on technology to support either front-end or back-end business operations following the COVID-19 pandemic. Robust infrastructure and the right ecosystem will simplify digitalisation of businesses and allow them to be more productive, efficient and prepared to compete in the global market. Digital transformation plays a major role in boosting businesses.

Drive smaller businesses to become widely accessible by adopting cloud technology and create a level playing field to compete with larger companies. Smaller businesses can now compete with larger companies through promoting their products and services on cloud platforms using social media marketing at a fractional cost and with minimal effort. This allows small companies to sustain themselves while expanding their growth through online presence.

TerraGrill increases sales through online promotion – Malaysia

A traditional food business expands its business through means of digitalisation. Leveraging on social platforms, the business soared up to 80% in sales. Also, the business remains resilient by leveraging sharing economy services such as food delivery during the restricted movements period due to the pandemic.

There are actions already in motion to drive digitalisation of SME in Malaysia such as:

100 Go Digital: A programme to excite and educate Malaysian businesses on digitalisation, focusing on digital adoption benefits.

SME Business Digitalisation Grant: A grant to encourage more local businesses to move rapidly into the technology sphere.

Sources: SME Corp Profile of MSMEs 2016-2021, SME Corp "Accelerating Malaysian Digital SMEs: Escaping the Computerisation Trap"; MDEC

Adopt a digital-first approach for growing businesses so they can look towards creating new business models in order to generate new value. Rather than focusing strongly on a rigid business model, businesses may remain resilient and competitive by venturing into new areas, becoming service platforms that leverage on the connected ecosystem in Malaysia. For example, the connection between rental car businesses, public transportation and package delivery

GRAB evolved from a ride sharing app to super app – Singapore

Grab, which started as a ride-hailing app expanded its operations in not just the ride-hailing sector but also set foot in new business verticals such as food delivery, grocery shopping, logistics delivery, on-demand video platform, hotel booking, ticket purchasing, and financial services.

Improve data-driven business decision making. Data plays a huge role in propelling businesses forward in the digital age. With digital transformation in place, the next frontier of these businesses is to determine insights from the vast amount of information acquired from clients and industries.

With data and analytics integrated in business processes, faster and better decision making is possible to ensure businesses remain relevant while delivering customer needs.

Algorithm-based dashboards will now allow even customer facing employees to make smarter decisions for their businesses.

AirAsia using AVA in collecting data before transferring to Allstar – Malaysia

The low-cost aviation company uses its chatbot AVA to identify customer issues before providing them solutions needed which reduces the action needed from physical employees.

Improve customer-centricity through behavioural analysis by understanding what delights customers. Using digital marketing, businesses should focus on gaining customers' attention while striving for business growth.

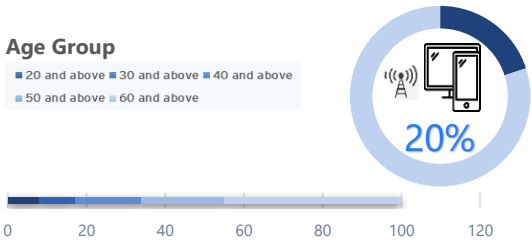
Connecting businesses through social media and data analytics allows them to engage their customers while understanding consumer patterns. This leads to innovative products and services aligned to customer needs and personalisation in driving better experience.

LEGO staying relevant through crowd-sourcing intelligence – Denmark

The toy company LEGO uses digitalisation as its edge when it combines physical and digital play in products, increasing digital engagement, and uses crowdsourcing to determine potential products based on what their consumers want. As a result, it continues to remain relevant in a market where video games are thriving.

Drive increased participation of citizens in digital economy

According to DOSM, Malaysia's population in 2022 is estimated at 32.7 million people. However, the World Bank estimated that 20% of Malaysians are still disconnected from technology due to its digital divide – in terms of age, location and literacy gap.



Due to lack of literacy, some citizens feel extremely insecure about conducting digital transactions online.

In order to grow the digital economy, citizens will need to increasingly adopt technology in their lives. With better infrastructure, previously underserved populations can now be included to contribute to Malaysia's growth and at the same time improve their living standards.

63.4% of women outside of the labour force have household responsibilities

1% of persons with disabilities employed and registered as of October 2018

It is also estimated that an average of 63.4% of women are outside of the labour force due to household responsibilities. Flexible working hours are needed for them to participate in the labour force. Unemployment is even worse among those with disabilities, where only 1% are hired across public and private sectors. Digitalisation will help vulnerable members of society to be fully involved and benefit from the digital economy.

Sources: World Bank "Malaysia Digital Economy"; DOSM "Principal Statistics of Labour Force, Malaysia, 2021; HRDF "Human Capital Report Issue: Feb 2019"

Connecting citizens across the digital divide is important for inclusive and sustainable economic growth. The deployment of 4G and 5G infrastructure across the nation needs to be fully optimized to narrow the digital gap. Digital literacy among the underserved and rural community is a pre-requisite in digital adaptation. Special programmes such as community classes and awareness sessions are among the measures that can be undertaken to increase digital literacy among these targeted groups.

Rural Internet Centre/Telecentres

One of initiatives in Malaysia involves equipping post offices with ICT infrastructure and launching websites with information related to public services, important events and local activities, free e-mail services and internet facilities.

Ramping up digital adoption to drive value creation across the digital divide. Malaysia can empower the unemployed by nurturing women and other citizens in digital entrepreneurship. Digital skills in e-Commerce, digital marketing and social media tools can help them to succeed in the digital world.

By leveraging on new forms of economy in Malaysia such as the sharing and gig economy, communities that had limited opportunities and employability can now be integrated as part of the economy. 26% of 15.3 million workers in Malaysia are gig workers, equivalent to almost four million freelancers.

eRezeki in providing equal opportunities

eRezeki is a programme which serves as a digital platform, offering job opportunities via crowdsourcing, aimed towards B40 group. This also includes the younger generation to generate additional income or secure a source of income.

Improving living standards through digitalisation and application of digital and emerging technologies. Better infrastructure, literacy and user sophistication plays a fundamental role in accomplishing this.

Malaysia can boost the usage of digital and emerging technologies in people's daily lives, for e.g. by focusing in areas such as digital payment, health tracking and others, enabling Malaysians to enjoy convenience and efficiency in daily tasks. The public sector can also leverage on digital technologies like IoT and big data to enable smart traffic, smart metering and smart sewage type of applications to improve utility services for the people.

Digital Lifestyle Initiatives for connected lifestyle Malaysia

Aims to promote and accelerate the development and adoption of the IoT and the makers community for a better quality lifestyle. Its objectives focus on providing better digital lifestyle, raising awareness and increasing productivity and sustainability.

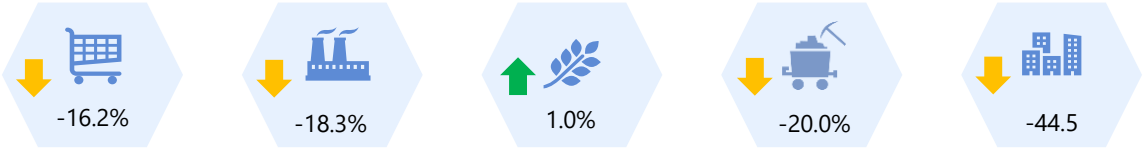
Economy that is ever evolving

Made possible with continuous innovation through industry transformation to drive productivity and efficiency.

Drive core industries innovation and growth via applications of emerging technologies

In 2021, Malaysia's GDP was RM1,545 billion, compared to RM1,418 billion in 2020. The digital economy is an important player in the country's economic growth and contributed to 22.6% of the GDP in 2020.

The unexpected impact of COVID-19 has affected businesses in almost all sectors. This is evident from the drop in GDP growth in all sectors except Agriculture:



Sources: DOSM Digital Economy 2021, DOSM "Gig Workers in Malaysia: A Review Definition and Estimation"; DOSM "Malaysian Economic Statistic Review Vol 4./2020"

Innovation through technology that brings positive business impact

Technology innovation is seen as the solution for businesses to remain competitive and productive while improving efficiency. Digitalisation will be advantageous in terms of:

1. Increased productivity –estimated to improve up to 39% efficiency
2. Reduce operating cost – estimated to reduce up to 20% of operating cost
3. Improve customer experience – 24/7 customer service capabilities to improve customer experience
4. Improve internal process integration – creates consistencies across different business departments
5. Opens new market opportunities – better collaboration between industries and logistics
6. Strengthens branding – create competitive advantages through social media presence

Digital and emerging technologies in creating competitive advantages

Many digital and emerging technologies can be leveraged to achieve positive impacts. Technologies such as Artificial Intelligence (AI), IoT, and Blockchain are expected to simplify and improve critical tasks and interactions in business.

The emergence of these technologies brings growth opportunities across the sectors in Malaysia and a provides a base to trigger innovations.

Artificial Intelligence (AI)

AI refers to the simulation of human thinking capabilities in computers which makes machines capable of performing tasks similar to those performed by a human. With machine learning and automation in place, mundane, repetitive and dangerous tasks can be automated. Some applications of AI include:

- Simplifying repetitive tasks such as the use of AI in chatbots for customer service
- AI usage in image classification and object recognition to find anomalies like cancer on MRIs
- Robo-advisors for stock trading by learning the investment patterns that lead to profit and loss

Internet of Things (IoT)

IoT refers to the usage of sensors that capture data based movements, touch, temperature and light and is often used to collect information regarding living and non-living things. The data captured will be shared through the Internet for processing and creating insights. Some applications of IoT include:

- Sensors incorporated in water meters, to collect, process and analyse data to identify consumer behaviour
- Sensors attached to machines coupled with software to predict machine maintenance requirements
- Traffic monitoring through sensors that detect vehicle movements and traffic conditions

Extended Reality (XR)

XR covers the element of AR and VR where users get access to an immersive experience of an alternate reality. It is being increasingly used for visual communications. Some applications of XR include:

- Training medical students towards better treatment of patients compared to traditional methods
- Virtual tours of real estates allowing potential buyers to walk through properties across the world
- AR helps engineers to inspect structures in real-time without being physically there

Robotic

Robotic refers to the usage of machines that can substitute for humans and replicate human actions that assist people in their day-to-day lives while ensuring safety. Usually coupled with AI in creating sophisticated assistance to humans. Some applications of robotics include:

- Use in dangerous environments such as bomb defusal
- Wide use in automobile manufacturing to perform simple repetitive tasks such as assembly line acitivities and welding

Blockchain

Blockchain is built through peer-to-peer topology allowing data be stored globally on thousands of servers – while letting anyone on the network see individual entries in near real-time. Blockchain is considered secure due to its cryptographic nature. Some applications of Blockchain include:

- A self-management platform for interactions and information exchanges on a global in a transparent manner
- Creating a protected personal data point where you encrypt selective information meant to be available to specific relevant people at certain times.

Industry Pain Points

Manufacturing

- Scheduled check
- Unplanned downtime
- Risk of injuries
- Skilled labour shortage
- Inventory management
- Increasing demand

Services – Finance

- Cybercrime in finance
- Data breach
- Keeping up with technology
- Customer retention
- Customer experience

Agriculture

- Climate change
- Rising demand
- Productivity
- Labour intensive
- High production cost
- Mentality of young generation

Services – Retail

- Customer retention
- Customer experience
- Ineffective marketing and sales

Construction

- Safety due to manual handling
- Skilled labour shortage
- Material planning

Services - Transport

- Traffic congestion
- Safety
- Environmental effect
- Energy consumptions

Utilities and Energy

- Environmental impact
- Affordability
- High production cost

Mining and Quarrying

- Access to energy
- Environmental impact
- Safety while manual handling
- Skilled labour shortage

Services - Education

- Inclusion in education
- Empathy in teaching
- Innovative learning

Services - Healthcare

- Data security
- Invoicing and payment
- Patient experience
- Medical errors

Digital and Emerging Technologies that can support industries growth:

Artificial Intelligence (AI)

Internet of Things (IoT)

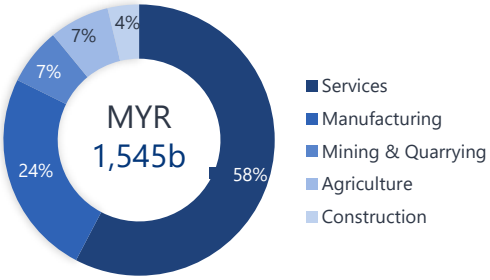
Extended Reality (XR)

Robotics

Blockchain

Other Technologies i.e. RFID

GDP contribution by core sectors in Malaysia, 2021



Source: DOSM: Malaysia Economic Performance 2015-2021

Industry transformation through emerging technologies and innovation

Robust secure infrastructure, corresponding talent, a digital ecosystem, and 5G as the backbone can spur sectoral growth with application of digital and emerging technologies. This will drive productivity and efficiency while addressing the pain points of each sector – as identified in the previous table.

The core GDP contributing sectors in Malaysia are: Services (58%), Manufacturing (24%), Mining and Quarrying (7%), Agriculture (7%) and Construction (4%).

For the purpose of this thought leadership publication, the services will be broken down to industries that have the potential to digitalise and drive value creation further, such as finance, retail, transportation, education and healthcare

Manufacturing

Manufacturing and its subsectors such as in commodities (petroleum, chemical, rubber), food and beverages, automotive as well as electrical and electronic products have played an important role in Malaysia's economic growth. Digitalisation of the manufacturing sector in Malaysia is currently at the forefront compared to other sectors due to the priorities laid out through Industry 4IR plans. According to MPC data, the industry manufacturing reports a of 5% rise in productivity and reduction in cost and downtime by 10% and 40% respectively through digitalisation and smart factory solutions. The technologies that can be applied in the manufacturing industry are:

- **IoT devices and cloud computing for tracking anomalies:** the use of sensors in machines to collect anomalies data that can be transformed into insights to predict whether a machine is due for maintenance or if products do not meet quality control requirements
- **Data analytics and reporting for decision making:** use of data analytics in predicting best action to be taken with regard to product quantity, type and innovation required to match customers' needs.
- **AI and robotics for continuous assembly:** use of robotics with AI and machine learning to enable 24/7 assembly line activities while ensuring quality control.

Leverage on Big Data and dashboards to improve value chain outputs in Malaysia

Laying the foundation through infrastructure and software to capture data from machines and driving the company towards real-time analytics and establishing preventive maintenance, to enable them to predict circumstances simply based on collected data and statistics.

- **Real time data and cloud computing:** real-time data analysis facilitate proactive prevention
- **Dashboards and visualisation:** Report and routine maintenance displayed on the screen to assist the workers to detect potential set of actions
- **Smart inventory management:** MES linked with ERP to assist in supervising current stock and purchasing raw materials
- **Quality improvement through feedback tracking:** The data benefits NationGate by tracking faulty reported by customers and results in better customer impressions
- **Outcome of digitalisation:** better quality control, increased production, reduced operating and maintenance cost

State of the art digitised production equipment and solutions for manufacturing in Malaysia

Leverage on world class automated equipment and manufacturing solutions for the semiconductor and manufacturing industries across the globe through automated equipment testing, automated manufacturing management and control.

- **IoT and cloud computing:** retrieve the data required at each business workflow through IoT in machineries in production process and integrate them in real time into the server using cloud computing technology
- **Data analytics to support reporting:** analytic software which speed up the process of sorts-out and analyses the big data in producing real-time report specific to the work order
- **Autonomous robotics for inspection:** better product quality in its class while acquiring zero defects
- **Automated update to customer:** update the customer in real-time on the order status and product quality status and instilling consumer confidence

Sources: DOSM "Malaysian Statistic Review Vol.4/2020"; MPC "Ready, Set, Go! The Race Towards Industry 4.0"

Management of unplanned manufacturing downtime in Japan

Use of predictive analytics to improve automotive manufacturing operations and productivity by eliminating unplanned downtime through IoT and data analysis.

Outcome:

- Automated system inspection line for product assembly
- Real-time visualisation and automatic report generation

Finance

The financial services sector in Malaysia is undergoing large-scale digital transformation that has a huge impact on how it operates. Emerging technologies are enabling banks, insurers and other financial services companies to reimagine how they run their businesses and serve their clients. At the same time, the emergence of these technologies creates opportunities for challenger businesses to disrupt the finance industry. To stay agile and relevant, the technologies that can be leveraged are:

- **AI for assisted customer service:** the usage of AI in powering chatbots and robots to provide complex customer service capabilities beyond normal hours.
- **Blockchain for secure transactions:** used for payment and tokenising traditional bonds, stocks, and other assets. Blockchain could also eliminate manual data reconciliation for bank ledgers.
- **Data analytics for real-time reporting:** learn more about customers and be able to make business decisions in real-time including learning about customer spending habits, sales management such as segmenting customers to optimise marketing.
- **Cloud Computing for agility of scaling up:** cloud computing enhances the agility of financial institutions and makes it easier and faster to scale up services while moving towards digital banking solutions.
- **IoT for tracking health status:** use sensors and trackers to identify the current health status of the customer and modify the insurance premium related outcomes.

Fraud detection and prevention using robotics, AI and machine learning in USA

Leverage on AI and machine learning to determine potential fraudulent cases through algorithm analysis and notify the relevant team for actions.

Outcome:

- Earlier detection of fraud cases with higher chances
- Minimise loss and negative impact to the company

Usage of IoT as source of gamification in insurance in Thailand

Using IoT such as fitness tracker to determine policy holder's health status which then converted into premium adjustment.

Outcome:

- Implied gamification for better engagement
- Increased user experience
- Increase sales in product across value chain i.e. fitness trackers, fitness products and healthy food

The latest development in the digital finance sector in Malaysia involved the Central Bank of Malaysia selecting five new recipients of the digital banking license in 2022 out of a total of 29 applicants. Three of the successful applicants (Boost and RHB; GSX and Kuok Brothers; and Sea Limited and YTL) are conventional, while two (AEON and MoneyLion; and KAF Investment Bank) will provide Islamic banking services. Digital banking is expected to expand banking services especially to the underserved, such as those in rural areas.

Agriculture

Agriculture plays a crucial role in the Malaysian economy, both in terms of exports and local consumption. Agriculture in Malaysia mainly revolves around rice, food crops, rubber and palm oil. The sector has a critical role in providing raw material, food, export revenue and employment opportunities. The latest national agricultural related policy (National Agrofood Policy 2021-2030, NAP 2.0) is focused on the modernisation of the agrifood sector in order to safeguard the future of Malaysia's national food security, which includes increasing the adoption of technology and automation in the agrifood sector, and digitalisation of the end-to-end value chain.

FIEGROW ENTERPRISE

Smart farming anticipate to increase yields, reduce reauired material and labour cost in Malaysia

IoT platform that enables farmers to use sensors to collect information, control various parameters on their farms and analyse real-time data in order to make informed decisions.

Outcome:

- Enhanced product quality and volume
- Increased efficiency
- Better control on processes from farm to distribution
- Weather prediction

Precision agriculture through drone technology in Malaysia

Using drone technology to execute precision agriculture that focuses on tree counting, scaling farm size, crop spraying and others through aerial data collection and data analysis via dashboard.

Outcome:

- Increased crop yields performance and control quality of agricultural products
- Reduced production costs through precision farming tools

Retail and Services

Malaysia economy gets a large contribution from the retail industry. According to DOSM, retail accounts for RM111 billion to GDP in 2021. The rise of digital commerce has provided opportunities for businesses to remain competitive:

- **Data Analytics for consumer needs analysis:** Retailers can now be proactive about the future by analysing consumer behaviour and trends from the past. Predictive analytics helps retailers to be smarter, more efficient, and reduce their costs.
- **IoT for simplified services:** IoT technology helps stores deliver new experiences to customers. Smart equipment such as sensor-embedded shelves that track inventory will also redefine retail operations.
- **Recommendation engines for cross-selling:** uses data to assess a customer's shopping behaviour and run it through algorithms to suggest additional products.

amazon

Cashier-less store leveraging on IoT in the US

An IoT-based system tracks items taken by customer and log them in a virtual cart. When the shopping is completed, all purchases will be automatically paid once the customer leaves the store.

Outcome:

- Easier and faster checkout
- Labour cost savings

Source: DOSM "Malaysian Statistic Review Vol.4/2020"

Construction

The construction sector contributed to almost 4% of total GDP in Malaysia. Despite being one of the less digitalised sectors, the emerging of new technologies may provide new values to this traditional industry. Among the technologies it can leverage on are:

- **IoT for machinery tracking:** allow construction machinery, equipment, materials, structures, and more to talk to a central data platform and providing data for informed decision making.
- **Drone for site surveillance:** usage of drone to survey a site in a fraction of minutes, which traditionally can take weeks or even months.
- **Building Information Modelling (BIM) for planning and estimation:** The usage of BIM in building structural design, materials and effort estimations.
- **AR/VR for notification on safety and area of work:** using lenses that gives signal in detecting surfaces, which are at high temperature or electrically charged.

PNB Merdeka Ventures

BIM usage in building skyscraper in Malaysia

Leverage BIM to automate all the information collection during the property building phases, that simplifies the work of each specialist via estimations on structure calculations, volume of material, operating costs as well as resources destined for each team.

Outcome:

- Avoid cost overrun through better planning
- Better coordination of activities and materials consumption
- Detailed work progress tracking

Transportation

Transportation is one of the fastest growing industries in Malaysia. The sharing economy and e-Commerce has increased the usage of ride-sharing and logistic services. In order to further improve its transportation industry, Malaysia can look into these emerging technologies:

- **AI in better traffic prediction:** using data, analytics, and cloud to help reduce travel time and manage congestion.
- **IoT for Global Positioning System (GPS) precision of driving:** using IoT to enable GPS to fulfil more functionalities like adjustments for extreme weather, safety hazard and traffic conditions or even preferred route.
- **Self-Driving Cars with AI:** Implementation and availability of 5G connectivity, will become the catalyst of self-driving fleet that may be leverage for fulfillment and deliveries.

Road safety improvement through IoT in Germany

Utilising IoT innovation to make vehicles and the roads they travel on safer and increase driving efficiency through proximity control, stop and go assist and 3D mapping.

Outcome:

- Highly automated driving by leveraging on GPS
- Increase driving safety through AI and machine learning
- Improve efficiency by avoiding unsafe routes

Energy and Utilities

The provision of energy and utilities requires balancing it with sustainability and productivity. In ensuring continuous supply, the energy and utilities industry can leverage on these technologies:

- **AI for forecasting usage:** AI to power predictive analytics that can forecast power or water usage within certain areas or predict machinery failure.
- **IoT for tracking of resources:** sensors deployed in the sewage system to identify the cleanliness of water to ensure that water is safe for consumption or actions need for water treatment.
- **Blockchain to add new value to energy:** blockchain has potential to support energy exchanges by logging transactions between groups of people to exchange excess energy between themselves.

Water facility monitoring through IoT in the UK

Single data dashboard for monitoring water facility activities across wastewater treatment value chain. Sensors are deployed in the sewage to the treatment plan to ensure continuous tracking.

Outcome:

- Deliver real-time monitoring and control
- Sensor provide data for water and wastewater operations and asset management.
- Timely alert for off-hours period for awareness

Self-healing grid system to automatically reconfigure itself through IoT the US

Self-healing grid system that automatically reconfigures itself when power loss occurs in customer's premises. The electrical system has the automation to automatically detect, isolate, and reroute power when a problem occurs.

Outcome:

- Continuous monitoring of the state of the grid
- Automated reconfiguration of electric grids
- Timely power restoration

Mining and Quarrying

Mining and quarrying is another major economic sector in Malaysia. It involves activities relating to the extraction and processing of metallic and non-metallic minerals. Mining and quarrying production in Malaysia includes ore, tin, bauxite and coal. Like construction, mining is one of the lesser digitalised industries. This industry can focus on the following technologies to drive its productivity:

- **Robotic and automation for hazardous activities:** usage of robots in critical activities by reducing the number of operators required in hazardous sites resulting in better safety.
- **IoT for predictive maintenance:** allows real-time capture of data from machines and equipment across the operation that can be used for planning and control, therefore supporting the decision-making process.
- **3D Modelling in creating perception:** allows the human brain to understand and relate to complex interrelated issues. 3D modelling supports firms by reimagining the mine more efficiently.
- **Geographic information systems (GIS) for mapping:** allows a comprehensive view of the geographic mapping that provides identification of which location and accessibility are critical.

TOTAL

Usage of IoT in collecting geoscientific data in Canada

Essential tool to increase the profitability of their oil sands exploration and production. Works through data collection via IoT in providing single view of geoscientific analysis across mining value chain in providing insights for better decision making.

Outcome:

- Resource optimisation during mining activities
- Better monitoring capabilities across mining value chain
- Integration between equipment and reporting for real-time reporting

Education

Education focuses on equipping Malaysians with necessary skills to support its growth as mentioned in the Digital Talent chapter. Although education is not the biggest contributor to overall Malaysia GDP, having a strong education foundation allows Malaysia to thrive in the digital landscape. Education can be more effective with the application of some of these technologies:

- **AI for adaptive learning:** adaptive learning allows students to receive tailored and personalised learning according to their existing and desired skill levels and learning styles.
- **AR and VR for used for remote laboratories:** virtual and remote labs offer flexibility, as students can run experiments repetitively. This allow students to feel less pressure in executing the experiment perfectly the first time.
- **Games and gamification:** using multiple technologies such as AR and VR coupled with AI to create an immersive and interactive learning environment.
- **3D modeling and printing:** where students and teachers alike can make their ideas tangible, create prototypes and propose solutions while providing more sensory experience in learning.

KNEWTON

Uses AI for courses that dynamically adapt to each student's unique needs in the US

Launched an enterprise-ready platform which analyses learning data, enabling content creators to tailor and adapt digital course materials to each student's unique needs.

Outcome:

- Personalisation of learning
- Better resource management
- Interesting content based on the learners

verizon

Virtual customer service training to mimic real situations in the US

Uses VR training to better prepare and train their call-centre employees where handling difficult customers is a routine occurrence. Trainees will be immersed into the point of view of the customers instead.

Outcome:

- Upskill customer service staff to be empathetic towards their customers
- Immersive experience and experiential learning

Healthcare

Malaysia is one of the preferred healthcare travel destinations in the world, as healthcare in Malaysia is both easily accessible and affordable. Malaysia is competing with the giants of the ASEAN medical tourism industry (Thailand and Singapore), and is promoting its 79 hospitals to ASEAN countries, although the main sources of medical tourism arrivals to the country are from the UK, Indonesia, the Philippines, Japan, Australia, China, India, and the U.S. To remain relevant, the following technologies can be leveraged on in the healthcare sector:

- **IoT in collecting health information:** helps in identifying potential chronic diseases based on identified algorithm and patents.
- **AI and machine learning for disease tracking:** can detect a number of diseases through algorithm, and enable predictive treatment
- **AR and VR in surgery:** VR walkthrough showing the patients how they can administer the medication themselves. As the scope of VR improves, doctors will be able to simulate surgeries and educate them on the challenges or risks they might have to endure, as well as how to overcome them.
- **5G application to support telemedicine:** telemedicine can provide accurate and timely personalised services through distributed healthcare. People can even be treated in their homes as they do not have to visit a hospital.

stuwardvü

Telemedicine leveraging on 5G in Switzerland

Telemedicine application which takes advantage of the roll-out of 5G and provides the service which helps connect independent medical professionals with people seeking online consultations.

Outcome:

- Help connecting doctor to patients across location
- Allows on-demand consultation from patients

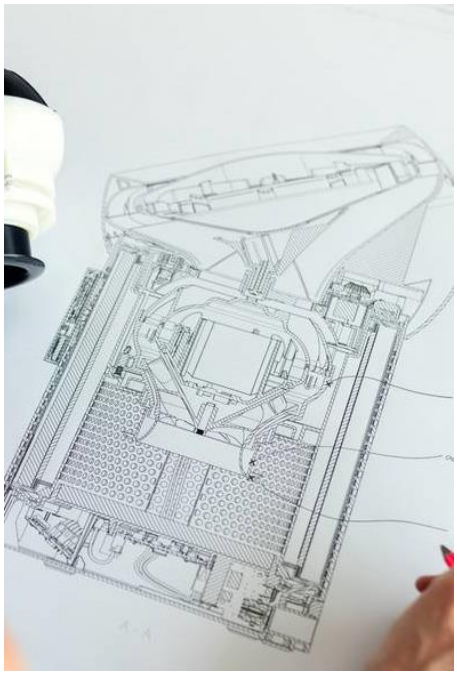
medopad

Uses IoT to predict potential chronic diseases in United Kingdom

Developed an app that compiles and analyses health data from patient wearables, mobile devices, and medical bodies to predict chronic diseases.

Outcome:

- Earlier detection of chronic diseases
- Decrease mortalities
- Create better awareness among patients



Industry innovation leads to new forms of economy

The transformation of these industries will spur innovation in various areas. While productivity improvements and efficacy take centre stage, innovation will create new economic opportunities, new business models, and processes.

While the industry focuses on scalability and rapid growth, the birth of the gig economy allows innovation and implementation to take place. Many opportunities are becoming available and are rapidly seized due to the agility of gig workers.

The collaboration between organisations across industries can introduce circular economy applications, focusing on environmental sustainability. This will allow wastage from different industries to be reused and repurposed to produce new products.

Economy with leading positions

Made possible with continuous innovation through industry transformation in driving productivity and efficiency.

1 Malaysia as an Islamic Finance Centre of Excellence

- 1st in the Global Islamic Economy Indicator
- 29 Islamic strong local FinTech players
- Producing a quarter of the world's Shariah-compliant financial assets, at $27 billion, and first place by number of funds (425).

2 Malaysia as a centre of digital content creation

- 3rd largest game market in South East Asia in 2020, with a game market of US$786 million.
- In 2019, digital content creation contributed RM29.4 billion to GDP.
- Development of digital games, animation, and interactive media is expected to generate over RM30 billion annually by 2025.
- 11,500 job creation in animation, VFX, new media, interactive media, AR/VR

3 Centre for e-Commerce in the region

- 2 international airports, with access to Asia-Pacific, Europe and the Middle East
- International seaport – 120 countries and 500 ports
- KL rail links to ASEAN

4 Malaysia as a centre of global services

- Global Services Centre in Cyberjaya, the first and only global services centre for AMD
- TÜV AUSTRIA Cybersecurity Lab Cybersecurity Testing and Certification Centre of Excellence
- Next planned site for Google's Data Centre

5 Malaysia as ASEAN testbed or sandboxing

- National Technology and Innovation Sandbox initiative to expedite regulatory intervention, deploy innovation and technology solutions
- Global Testbed initiative and DroneTech as the testbed pilot

6 Malaysia as a high-tech manufacturing centre

- Contributed to 23% of Malaysia GDP
- Emerging regional robotics centre
- Strong manufacturing of Electrical and Electronic (E&E) and Medical products
- More high-tech companies are investing in Malaysia, including Amazon Web Services, Microsoft, Ferrotec, Insulet, Indium Corporation, Cue Health, Texas Instruments, Boston Scientific and Nextracker Inc.

Drive growth of core industries with emerging technologies

Malaysia is a recognised industrial force in ASEAN, and can become the preferred destination for foreign investments, supported by its diversified culture, sectors, and competitive advantages. Malaysia can strengthen its standing through its differentiators and strengths.

Malaysia a Islamic finance centre of excellence

26% Malaysia has become a leader in Islamic finance, producing a quarter of the world's Shariah-compliant financial assets by the end of 2020.

1st Ranked first in the Global Islamic Economy Indicator, specialising in finance, halal food, travel, and media and recreation.

29 Out of the 198 FinTech players in Malaysia, 29 are focusing on Islamic FinTech to drive Islamic Finance forward.

Source: FinTechNews Malaysia "Malaysia is a Leader in Islamic Finance, But Why Not Islamic FinTech?"; ICD-REFINITIV "Islamic Finance Development Report 2019 – Shifting Dynamic"

Positioning Malaysia as an Islamic finance centre of excellence should be possible as it already has a strong foundation. In order to strengthen its position, Malaysia can look into the following actions:

Embrace FinTech disruption for continuous growth of Islamic finance in terms of speed, traceability, accessibility and governance. Malaysia should leverage on the ever- expanding FinTech industry in identifying shariah compliant financial services in areas such as robo-investors and gold trading. With the existing finance regulatory testbed, further innovation can be accelerated.

- **Positioned as the centre of inclusive standardisation** to provide consultation on shariah alignment. Having produced a large number of world shariah compliant assets, Malaysia can position itself as consultant in establishing understanding and communicating the different interpretations of shariah and the creation of sukuk.
- **Leads in other forms of Islamic finance including the concept of green finance** to support transformation efforts towards a green economy. The world's first green sukuk developed in Malaysia places the country in a strong position to lead more sukuk development in the future.

FINTECH BOOSTER

BNM and MDEC launched FinTech capacity building programme, FinTech Booster – Malaysia

The programme is intended to support the growth and development of FinTech companies in Malaysia and is also open to foreign companies who have yet to establish a presence in Malaysia. Its main focus is to assist FinTech companies in understanding regulation and compliance matters, gain market access and technology.

BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA

BNM sets up Regulatory Sandbox

Provide a regulatory environment that is conducive for the deployment of financial technology. This includes reviewing and adapting regulatory requirements which will be the base for FinTech technology development.

Malaysia as a centre of digital content creation

Since 2017, Malaysia has been growing rapidly in the digital content industry with a strong focus on the creation of games, animation and other forms of media. This positioning can be further strengthened with the following:

- **Attractive stage for anchor games and animation studios** through state-of-the-art digital content platforms. Through the years Malaysia has set the stage for other countries to learn, contribute or compete in the field of digital content. This effort should be continued and strengthened..
- **Revising the IP development policy** to allow sustainable digital content creation growth by focusing on minimising copyright infringement, funding of content creation and other relevant policies.
- **Content that leverages on Malaysia's diversity** by accessing local talent with cultural influences from both the east and west. As the content is widely consumed by the knowledge industry, having content which is relevant to different ASEAN countries can provide better uptake.

RM29.4 billion — Contribution to GDP from the digital creative industry in 2019

11,590 — jobs created through multiple digital content companies that produce animation, VFX, new media as well as games, interactive media, AR/VR.

MDEC set up a supportive creative platform to spurs creative content creation – Malaysia

The Kre8tif! programme aims to spark innovation and exploration of major trends in the creative sector via sharing, technical insights and future shaping trends – locally, regionally and internationally. This also provides a platform to share and learn from each other.

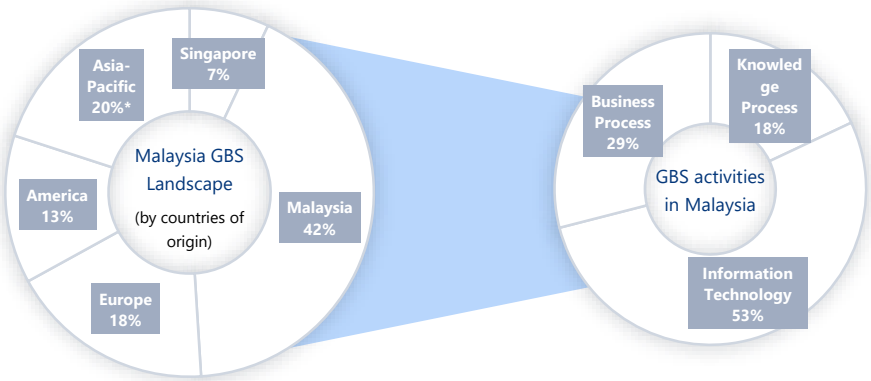
Malaysia as an e-Commerce hub for the region

Malaysia has a strong base to act as the key e-Commerce hub. The e-Commerce sector in Malaysia has grown tremendously in the past few years, and the Department of Statistics in Malaysia reported a total income of RM1.09 trillion from e-Commerce transactions in 2021, a growth of 21.8% over or RM896 billion in 2020. In ensuring Malaysia will act as the e-Commerce hub for the region, these opportunities cannot be overlooked:

- **Leveraging on Malaysia's current geographical location** to be the connector between neighbouring countries to ease trade. Malaysia has a strong geographical position as it is placed in the middle of the Asia-Pacific. With its strong transportation hubs connecting cities and countries through land, air and sea, Malaysia can act as the e-Commerce hub for the region.

Malaysia as a centre of Global Business Services

Malaysia has a strong position as ASEAN's leading regional GBS hub as it is ranked 3rd in the Global Services Location Index. With its strong digital foundation, competitive digital talent pool and leverage on Industry 4.0 applications, Malaysia has successfully attracted many leading MNCs to relocate their Asia-Pacific operations.



Global Services Location Index, 2021

1st India
2nd China
3rd Malaysia
4th Indonesia
5th Brazil

Source: EY "KL Calling 2020"; Kearney Global Services Location Index 2021

To boost this growth, the following opportunities may be looked into:

- **Competitive tax and incentives structure** to encourage MNCs to set up base in Malaysia. A change in tax structure which focuses on providing incentives for the initial years to companies that are operating in Malaysia will allow them to realise the value they may create and achieve.
- **Skilled and diversified talent** from various backgrounds can provide opportunities for a company's growth. Malaysia's unique demographic allows its talent to be adaptive and provide value through its multilingual and diversified workforce.
- **Digitalisation eases transition of companies** to move into Malaysia. With its robust digital landscape and competitive positioning, MNCs will find it easy to shift their companies to Malaysia.

AMD laid foundation of global business services in Cyberjaya – Malaysia

AMD has expanded its footprint in Malaysia through its Global Services Centre in Cyberjaya, which is AMD's first global services centre set up to meet the growing demand within the AMD global network for organisational and operational services. The centre has a workforce of over 600.

Malaysia as the ASEAN Testbed and Sandbox

Testbeds are no longer an emerging phenomenon in Malaysia. Multiple agencies have ensured that technology providers and innovators are primed with relevant platforms to support product testing. For example, the Central Bank of Malaysia (Bank Negara Malaysia, BNM) has introduced a regulatory sandbox to enable FinTech innovations to be deployed and tested in a live environment, with specified parameters and timeframes. Positioning Malaysia as the ASEAN testbed can be done through the following opportunities:

- **Drive global testing through collaborative sandbox** via application of cloud as the platform for testing industry applications and new startup solutions. Robust and strong infrastructure will allow Malaysia to support other countries in hosting their technologies for strenuous testing and applications.
- **Drive inclusive testing through Malaysia's current diversified sectors**, community, and population. These diversifications allow tech companies and innovators to test their products and inventions based on different angles to achieve multifaceted results. Malaysia, being the 42nd most populated country in the world, will allow companies to get the right testing size without overwhelming its inventions and innovations.

Malaysia announced Global Testbed initiative for DroneTech – Malaysia

This testbed creates access to fast growing regional DroneTech markets, attractive investment packages as well as prospects in contributing to the Malaysian economy.

The testbed also provides opportunities to collaborate with Malaysia's best DroneTech players in shaping the future of DroneTech policies and regulations.

Malaysia as a high-tech manufacturing centre

Malaysia's strengths in E&E and device production means that its manufacturing landscape is at the forefront in the ASEAN region. The rollout of Industry 4.0 has resulted in substantial improvements in production and efficiency in Malaysia's manufacturing sector.

Malaysia can become the regional hub for manufacturing and R&D capital for high-value products and technologies, with support from Industry 4.0 applications and innovation, by seizing the following opportunities:

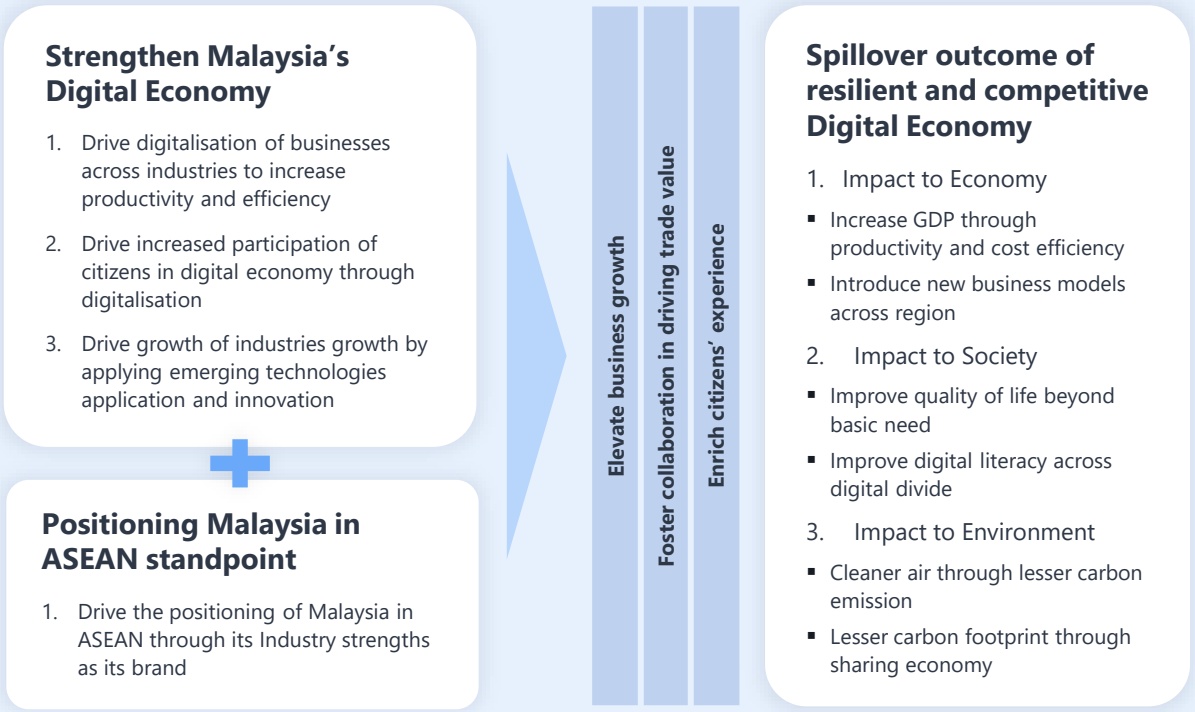
- **Drive productivity, minimise cost, increase quality and improve customer satisfaction through innovation and application of relevant technology**. This can be further strengthened through application of technologies such as AI, IoT, 3D Printing and other relevant technologies which can improve business throughput in the industry.
- **Centre of excellence for collaboration through new implementation of technologies in manufacturing**. Malaysia can be the focal point for collaboration between tech providers and software solution providers that can then be mirrored by other ASEAN countries. Manufacturing companies can provide consultation services and be collaborating partners in sharing knowledge with other countries.
- **Improved focus on manufacturing of E&E and Medical products** as core manufacturing products that can provide large export capacities for Malaysia. Better productivity can be achieved in the fabrication of AI chipset and devices, medical devices, and automotives. R&D will also have to be accelerated to ensure new and improved products can be produced via application of new technologies such as additive manufacturing and 3D printing.

Leverages and differentiation for the Digital Economy

In the push to become ASEAN's Digital Capital, Malaysia can focus on leveraging on existing initiatives to expand the digital economy. These are illustrated in the figure below:

	Accelerate	Develop	Review
Leverage	• Improving Data-driven business decision making with analytics and big data • Connecting citizens across digital divide through better infrastructure • Ramping up digital adoption in driving value through citizens participation and employment • Increasing standard of living with the applications of digital and emerging technologies, i.e. smart sewage, smart traffic • Driving core industries growth through application of emerging technologies by solving challenges		• Digitalising of business through digital transformation with cloud platform and other technologies
Differentiate	• Position Malaysia as Islamic Finance FinTech centre of excellence by leveraging on its current Islamic Finance strength and policies • Position Malaysia as centre of digital content creation through better intellectual property development and policies • Position Malaysia as e-Commerce Hub for the region by leveraging on Malaysia's geographical advantage • Position Malaysia as High-value Manufacturing centre of excellence by leveraging on Industry 4.0 and innovation	• Position Malaysia as ASEAN Innovation testbed and sandboxing through leveraging on cloud computing capabilities and better policies • Position Malaysia as centre of global services through better policies and infrastructure	

Actions needed to grow the Digital Economy



Malaysia can expect positive outcomes from identifying leverages and differentiators to strengthen Malaysia's digital economy and positioning in the ASEAN region. These benefits will spread across three areas:

Elevate business growth:

- Improves efficiency and productivity through application of emerging technologies such as AI and IoT
- Provide business positioning in global context through web and social media positioning
- Encourages innovation in term of business processes, models and products
- Provide timely and better decision-making through data analytics

Foster collaboration in driving trade value

- Introduce collaboration between industries through technology to continuously grow
- Introduction of collaborated business model through integrated ecosystem across sectors
- Improve foreign and direct investment through elevated business growth
- Improve the leverage on sharing economy and gig economy in driving e-Commerce value

Enrich citizens' experience

- Improve citizens adoption and inclusion towards technology in breaking the first frontier of digital
- Improve citizens literacy and capabilities to further improve their lives
- Improve the accessibility of products beyond that are available in the country

Value creation towards Malaysia's GDP growth

The digital economy is expected to bring value to Malaysia's GDP growth, especially after strengthening digital infrastructure, security, talent and ecosystem. These will ensure that Malaysia is ready to be positioned as ASEAN's Digital Capital.

The Malaysia Digital Economy Blueprint expects the digital economy to contribute 22.6% to Malaysia's GDP by 2025, although this was already achieved by the end of 2020 (22.6%) according to a DOSM report published in 2021. The contribution is expected to rise to 35% of GDP by 2030. The Blueprint also expects a 30% increase in productivity across all economic sectors by 2030. The growth is expected to be from the increase in digital transactions among Malaysians, improved productivity and efficiency from businesses across sectors and investment from foreign and domestic investors.

Parallel to the growth, it is forecasted that Malaysia can also experience a growth in jobs by up to 1.5 million by 2030, providing opportunities for Malaysia to become a high-income nation.

RM1.8 trillion incremental GDP

Additional digital economy potential by being ASEAN Digital Capital, cumulative 2021–2030 (Digital economy growth from ~8% to 12% contributing 35% of GDP in 2030)

1.5 million incremental jobs

Exciting job opportunities will arise with the advent of Malaysia as the ASEAN Digital Capital, cumulative 2021–2030

Recognisable impact of Digital Economy

Positive impacts of the Digital Economy are apparent in these areas:

Economy

Impact on the economic growth

Increase GDP through productivity and cost efficiency
Automation of repetitive processes allow businesses to operate more efficiently i.e. assembling in manufacturing

Introduce new business models across region
Rise of new business models that contribute to the economy of the nation and ASEAN with the collaboration within ecosystem i.e. sharing economy, circular economy

Increase of employability through emerging skills
New business models and technology applications that create new job opportunities i.e. Automation create needs for RPA and AI specialist within nation and also creating opportunity across borders

Increase in earned income through digital employability
Digital industry creates opportunities for high-income employability which in turn contribute to country in reaching high-income bracket

Increase interoperability across nations
Malaysia as Digital Capital may provide other nations with sustainable connection and cloud services which can support their internet speed and data management

Increase international collaborations
Malaysia can share knowledge, talent, skills, policies standardisation through its rapid growth and positioning in driving ASEAN economy

Society

Impact on the societal wellbeing

Improve quality of life beyond basic need
Smart living allows better quality of life through psychological (i.e. communication, connection) and physiological needs (i.e. health, security)

Improve digital literacy across digital divide
Digitalisation can drive literacy among all sections of the society in the form of digital skills that will help uniform development and integrated social fabric

Better awareness on current issues
Allow societies to be informed and aware of current issues happening around the world and drives empathy i.e. issues within ASEAN and beyond

Minimise crime rate
Smart city solutions, digital ID and surveillance systems that will ensure better security within the community which in turn will reduce crime rates in Malaysia

Environment

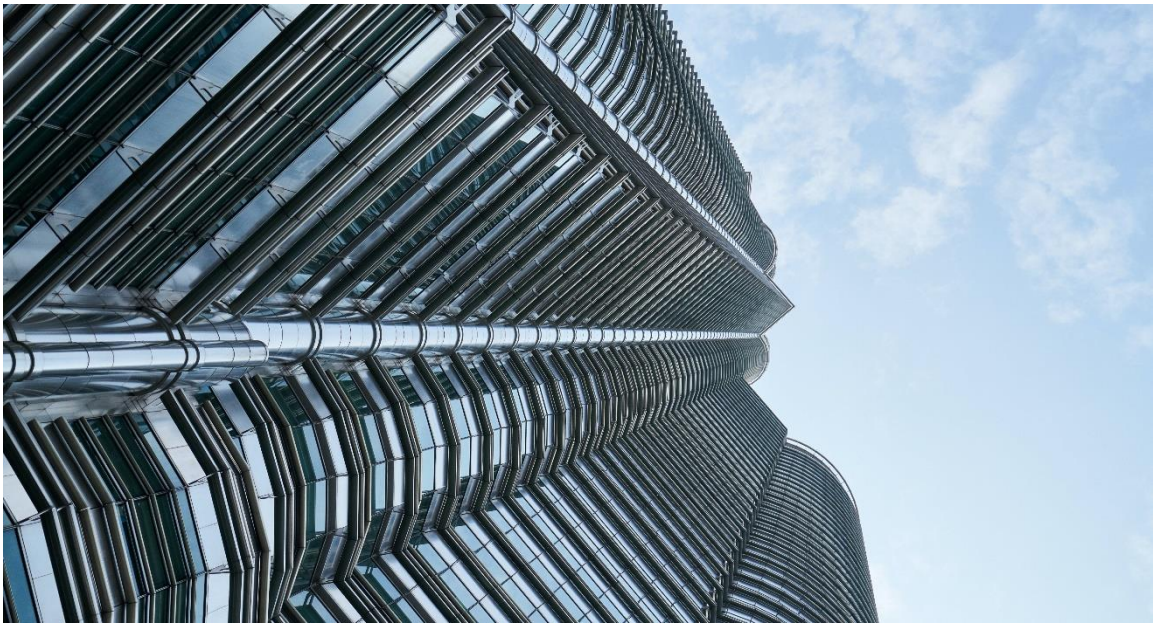
Impact on environmental sustainability

Cleaner air through lesser carbon emission
With more work and learning moving into the digital space, lesser travelling is required which results in lesser carbon dioxide emission

Lesser carbon footprint through sharing economy
The sharing economy minimises the impact to the environment in term of carbon emission, production and development due to its collaborative nature

Improve green conservation
Digitalisation of reading materials (i.e. Kindle, eBook) minimises the need of paper which resulted in better conservation of environment

Better waste management
Collaboration between different industries while looking into better conservation allow the introduction of circular economy which promote the reuse of wastage across region in building new product as well as minimising the need of waste dumping areas



CHAPTER 8

Building Malaysia's differentiators

The key priorities from each Building Block and the positioning of the digital economy provide the base for positioning Malaysia as Digital Capital of ASEAN. It is crucial for Malaysia to focus on its strengths and leverage on efforts while creating differentiating factors in areas where Malaysia has a competitive advantage, in order to tap into opportunities.

This will allow Malaysia to position itself as ASEAN's Digital Capital and truly achieve the aspirations of being the region's Centre of Interest, Centre of Excellence and Centre of Innovation.

Through consolidation of the earlier chapters, there are various differentiators that Malaysia could consider:

- Create Industry Internet Platform
- Build Trust in the System
- Develop and Attract Diversity
- Cultivate Innovation and Unicorns
- Spearhead Digital Trade

Customise Sector Specific Positioning

- Islamic FinTech
- Industry 4.0 High-value Manufacturing
- Digital Creative Content
- Global Business Services
- Global Tech Testbed

Each of the differentiators is elaborated in this chapter, including descriptions, key elements and how to achieve the proposed positioning. The 'How to achieve?' aspect looks into leveraging on Malaysia's strengths, addressing ASEAN's needs and the critical focus areas to achieve the differentiators.

Create Industry Internet Platform

Description

Global data centre capital and regional capital for an Industry Internet Platform, with industry-focused infrastructure to support industrial applications and ecosystem

Key elements

- 5G-enablement for industrial applications
- Demand for high capacity and quality data centres (Tier 3 and 4)
- Industry cloud platform for storage and computing
- AI-enabled computing capabilities and processing
- Stable connectivity for industrial IoT support

Relevant areas

Digital Infrastructure, Digital Security, Digital Talent, Digital Ecosystem, Digital Economy

How to achieve?

Leveraging Malaysia's strengths in:

- Existing data centre and infrastructure readiness to upscale
- Strategic position as landing base for submarine cables
- Cloud solutions and development in Malaysia

Addressing ASEAN needs:

- Availability of cloud solutions in the ASEAN market
- ASEAN as an increasing hotspot for data centres due to high growth opportunity
- Infrastructure readiness and electricity competitiveness for data centres in other emerging markets in ASEAN
- ASEAN countries pay relatively high internet protocol transit prices to access international internet connectivity, a better infrastructure will help to optimise prices

Critical focus towards the positioning:

- Timely roll-out of 5G
- Institutionalise cloud
- Institutionalise use of industrial IoT and AI-enabled IoT
- Increase submarine cables for increased data traffic

Build Trust in the System

Description

Digital security leader to create confidence in Malaysia and support the ASEAN region, with forward-looking policies and Cybersecurity solutions and technology innovation

Key elements

- Create high security standards and confidence, with a strong culture of security to promote operations and innovation in Malaysia
- Leader in Cybersecurity and Data Privacy
  - Thought leader for forward-looking policies such as data sovereignty and localisation policy
  - Leading solutions and innovation development, including blockchain

Relevant areas

Digital Infrastructure, Digital Security, Digital Talent, Digital Ecosystem, Digital Economy

How to achieve?

Leveraging Malaysia's strengths in:

- Cybersecurity position today, ranked 8th in Global Cybersecurity Index
- Malaysia is one of the top security solution provider in ASEAN

Addressing ASEAN needs:

- A centralised framework for ASEAN is still currently in development
- Cybersecurity capacity in both solutions and talent remain a shortage in region and globally

Critical focus towards the positioning:

- Drive innovation of cybersecurity solutions and blockchain innovation
- Develop data sovereignty policies to create clarity and confidence in data security
- Strengthen cybersecurity talent development and retention
- Play a role as a harmonisation agent for ASEAN for both cyber and data security

Develop and Attract Diversity

Description

Congregation of diverse talent that is multi-linguistic, cultural and competencies equipped with emerging digital and tech skills for local development and capabilities export

Key elements

- Malaysia has diverse talent pool with multi-linguistic, cultural and competencies capabilities equipped with emerging digital and tech skills
- Digital thought leaders and champions
- Global talent knowledge infusion
- Network of diverse talent pool with multicultural advantage

Relevant areas

Digital Talent, Digital Ecosystem, Digital Economy

How to achieve?

Leveraging Malaysia's strengths in:

- Diverse talent pool and talent development
- Education and talent development programmes to enhance technology capabilities

Addressing ASEAN needs:

- Digital talent remains a shortage across ASEAN

Critical focus towards the positioning:

- Strengthen learning pipeline from youth to workforce
- Identify digital thought leaders
- Focus on talent retention through clarity in career prospects and salary optimisation
- Ease of hiring global talent, specifically to fill the gap
- Establish talent network

Cultivate Innovation and Unicorns

Description

Institutionalised innovation and adoption maturity in platforms and new business models, leveraging on consumer sophistication

Key elements

- Digital platforms for new economy models, e.g. sharing and gig economy
- Innovation mindset
- Strong innovation and startup ecosystem
- Focus on attracting and developing unicorn

Relevant areas

Digital Talent, Digital Ecosystem, Digital Economy

How to achieve?

Leveraging Malaysia's strengths in:

- Recognition of eRezeki and eUsahawan platforms to promote innovation

Critical focus towards the Positioning:

- Institutionalise platform adoption and innovation
- Drive startup innovation with focus on unicorn
- Strengthen the innovation ecosystem, covering startups, investors, accelerators and academia
- Drive data-centric ecosystem and usage of data for innovation
- Increase availability of open data for solutions innovation and development

Spearhead Digital Trade

Description

Digital Trade Capital for Asia to drive e-Commerce and monetisation of Digital Asset Exchange (DAX) platform to drive regional transactions and data flow

Key elements

- Digital Trade Capital to drive regional digital trade
- End-to-end digital trade platform with:
  - Value chain management solutions
  - Logistics digitalisation for optimised and seamless movement of goods
  - Secured cross-border transaction, payment and data flow

Relevant areas

Digital Infrastructure, Digital Security, Digital Talent, Digital Ecosystem, Digital Economy

How to achieve?

Leveraging Malaysia's strengths in:

- Strategic port location for trade and supply chain capabilities
- Dedicated agency to oversee and support DAX capabilities and licenses

Addressing ASEAN needs:

- Digital trade capabilities and adoption in emerging ASEAN countries are still relatively nascent
- Cross-border transactions still requires further development to create stronger confidence in the ASEAN market

Critical focus towards the positioning:

- Establish strong value chain digitalisation ecosystem
- Develop a platform aggregator
- Spearhead payment platform and ecosystem
- Drive data-centric ecosystem and usage of data for optimised trade operations and efficiency

Customise Sector Specific Positioning

Islamic FinTech

Description

Centre of Excellence and innovation leader for Islamic FinTech financial and digital assets, offerings and solutions sandboxing and development

Key elements

- Shariah-compliant financial and digital assets, offerings and solutions for Islamic FinTech
- (Islamic) FinTech regulatory sandbox
- Blockchain advancements and application for Islamic FinTech

Relevant areas

Digital Infrastructure, Digital Security, Digital Talent, Digital Ecosystem, Digital Economy

How to achieve?

Leveraging Malaysia's strengths in:

- Leverage on current positioning as Islamic Finance Hub
- Regulatory sandbox for financial services, focusing on FinTech
- Strong policy direction and efforts for FinTech development

Addressing ASEAN needs:

- FinTech solutions in emerging ASEAN countries are still relatively nascent

Critical focus towards the positioning:

- Drive innovation in Islamic FinTech digital assets, offerings and solutions
- Advances in blockchain development, innovation and applications for FinTech

Industry 4.0 High-value Manu-facturing

Description

Regional manufacturing and R&D capital for high-value products and technologies, infused with Industry 4.0 applications and innovation

Key elements

- R&D and manufacturing of high-value products and technologies, e.g. AI chipsets and devices, drones
- Standards development and setting for high-value products and technologies
- Industry 4.0 applications and innovation, e.g. smart factories, IoT, AI, automation

Relevant areas

Digital Infrastructure, Digital Security, Digital Talent, Digital Ecosystem, Digital Economy

How to achieve?

Leveraging Malaysia's strengths in:

- Strong Electrical and Electronics manufacturing base

Addressing ASEAN needs:

- Increasing need for the scale of the high-value products and technologies as the ASEAN countries become more digital
- Industry 4.0 adoption in emerging ASEAN countries are still relatively nascent

Critical focus towards the positioning:

- Timely roll-out of 5G to support Industry 4.0 applications
- Spearhead ecosystem development and adoption in Industry 4.0
- Institutionalise use of industrial IoT and AI-enabled IoT
- Focus the direction on high-value products and technologies R&D and manufacturing
- Drive data-centric ecosystem and usage of data for greater productivity

Digital Creative Content

Description

Leader in Intellectual Property (IP) commercialisation and exports for digital creative content creation of products, services and capabilities

Key elements

- Digital creative content creation and capabilities, e.g. animation, visual effects and gaming
- Intellectual Property commercialisation and exports
- Emerging technologies innovation, e.g. AR/VR
- Software and license for creative development
- Studios and schools to cultivate creative content development

Relevant areas

Digital Infrastructure, Digital Security, Digital Talent, Digital Ecosystem, Digital Economy

How to achieve?

Leveraging Malaysia's strengths in:

- Current capabilities in digital creative content
- Strong IP protection and commercialisation base to ensure a secure environment

Critical focus towards the positioning:

- Strengthen the innovation on leveraging on emerging technologies, e.g. AR/VR
- Drive IP development and commercialisation
- Strengthen digital creative content talent development

Global Business Services

Description

Centre of Excellence for Digital Global Business Services and Outsourcing driven by digitalisation, leveraging on AI and automation and digital solutions as a service offerings

Key elements

- Digitalised business services with emerging technologies, e.g. AI and automation
- Digital services leader, e.g. software solutions, digital marketing and design, cybersecurity solutions
- Centre of ASEAN for digital talent

Relevant areas

Digital Infrastructure, Digital Security, Digital Talent, Digital Ecosystem, Digital Economy

How to achieve?

Leveraging Malaysia's strength in:

- Malaysia ranked as 3rd most attractive global destination for GBS, in Kearney 2019 Global Services Location Index

Critical focus towards the positioning:

- Focus the direction on high-value digital services and digitalised GBS
- Develop digital talent pool to support the GBS industry for operations and continuous innovation for high-value solutions
- Drive digital solutions as a service models to create conducive digitalisation ecosystem in Malaysia and to serve the ASEAN region
- Establish and institutionalise frameworks and guidelines for Malaysia to serve as a centre location for services

Global Tech Testbed

Description

Testing ground for cutting edge technologies and solutions innovation for Global Tech players, equipped with robust enabling infrastructure and sandboxing environment

Key elements

- Cutting edge technologies R&D and solutions innovation for commercialisation
- Innovation testbeds and sandbox
- Strong innovation ecosystem for technology
- Enabling infrastructure (e.g. 5G, Cloud, AI lab)
- Clear policy direction on innovation focus

Relevant areas

Digital Infrastructure, Digital Security, Digital Talent, Digital Ecosystem, Digital Economy

How to achieve?

Leveraging Malaysia's strength in:

- Existing efforts in innovation and infrastructure; e.g. tech and innovation parks and sandbox
- Diversity in demographics which is supportive in data collection

Critical focus towards the positioning:

- Timely roll-out of 5G and spearhead innovation of industrial 5G use cases
- Strengthen the enabling industry internet infrastructure for R&D and innovation
- Strengthen the innovation and R&D ecosystem, covering startups, investors, accelerators and academia
- Establish conducive regulatory environment and sandboxing
- Drive data-centric ecosystem and usage of data to support technology R&D and solutions innovation

CHAPTER 9

Malaysia's transformation towards becoming the ASEAN Digital Capital

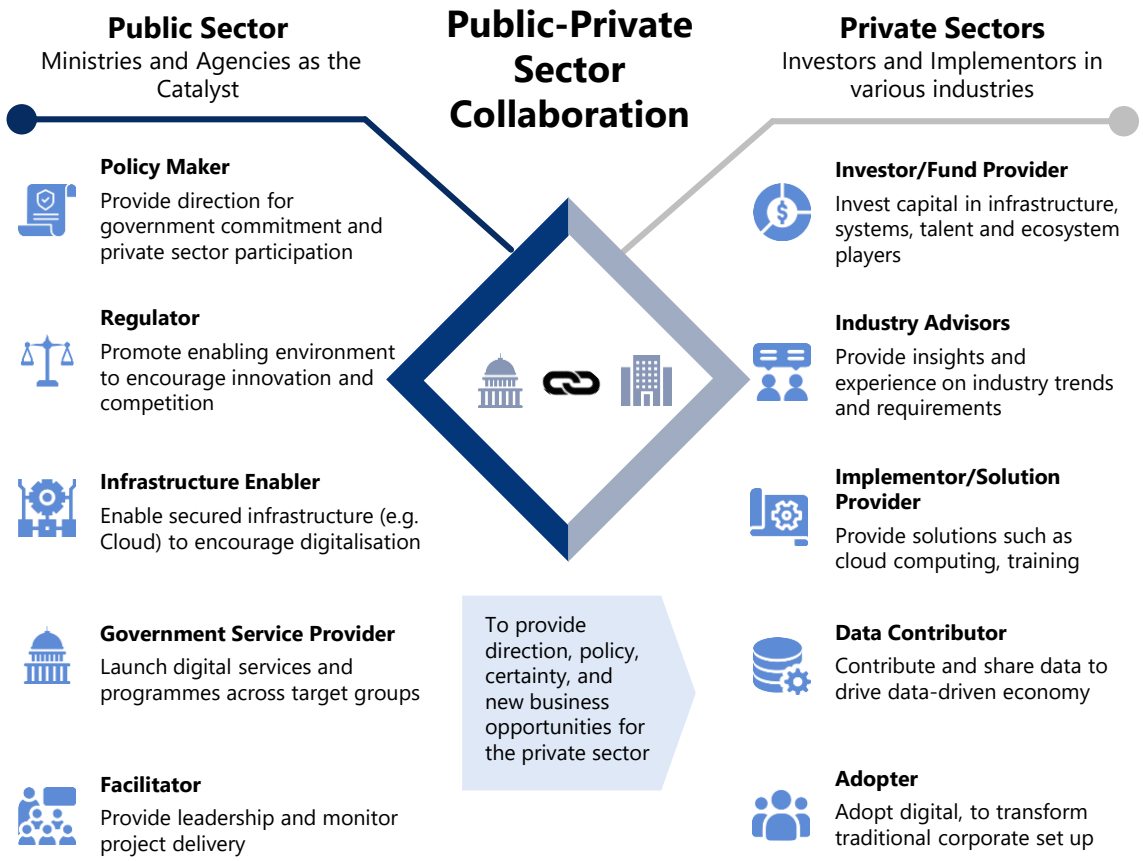
Strategic collaboration between the public and private sectors are needed to successfully position Malaysia as ASEAN's Digital Capital. It requires investments and participation from the private sector, and sound public policies and a conducive investment climate. These policies will provide clear and strategic direction and create confidence in the private sector.

Smooth and effective execution matters, and a clear implementation plan with key milestones and priorities is required, with regular monitoring.

Public-Private Sector Collaboration is critical to drive value creation

The Malaysia Incorporated Policy in 1981 aimed to encourage co-operation between the public and private sectors and allow the private sector to play a significant role in economic development. The role of the private sector continued to expand, facilitated through the public-private partnership (PPP) model, which has proven effective. For instance, the technology giant Huawei has an effective partnership collaboration with the government in deploying digital infrastructure in the telecommunication sectors.

Below is an overview of public and private sector collaboration to drive value creation:



Ten strategic priorities to accelerate the journey

Malaysia has made significant efforts to be a fully digital economy. Strategic priorities are crucial to positioning the country as ASEAN's Digital Capital. Ten strategic priorities have been identified to achieve this.

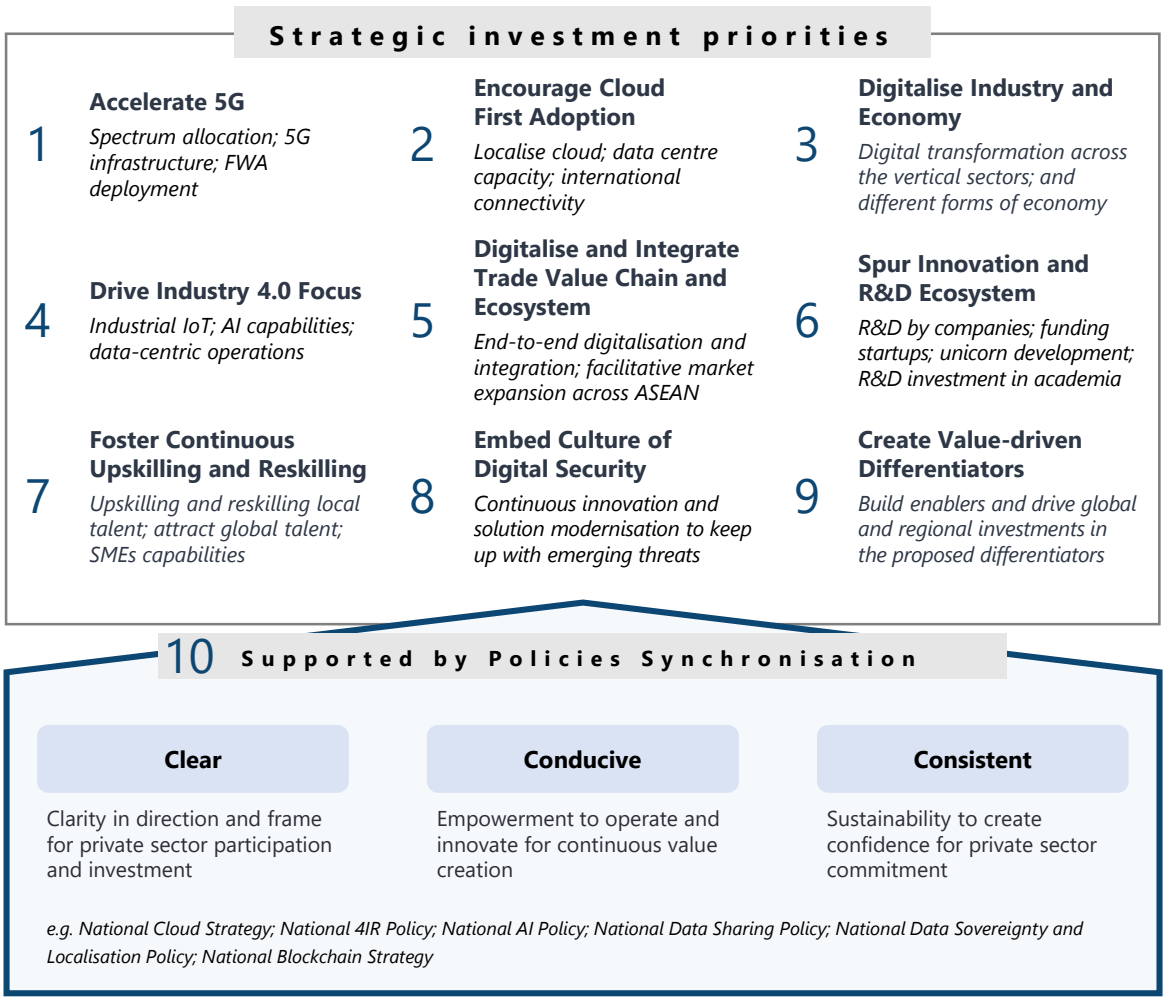
Prioritise and strengthen investment opportunities

Investment from both public and private sectors could incubate new initiatives towards innovation and realisation of societal and economic gains.

Key policies to drive the investments and value creation

Policy makers are required to set clear, conducive and consistent policies to shape Malaysia's digital transformation. There is a need for clarity in direction, as conducive and consistent policies will empower the private sector to invest, operate efficiently and innovate.

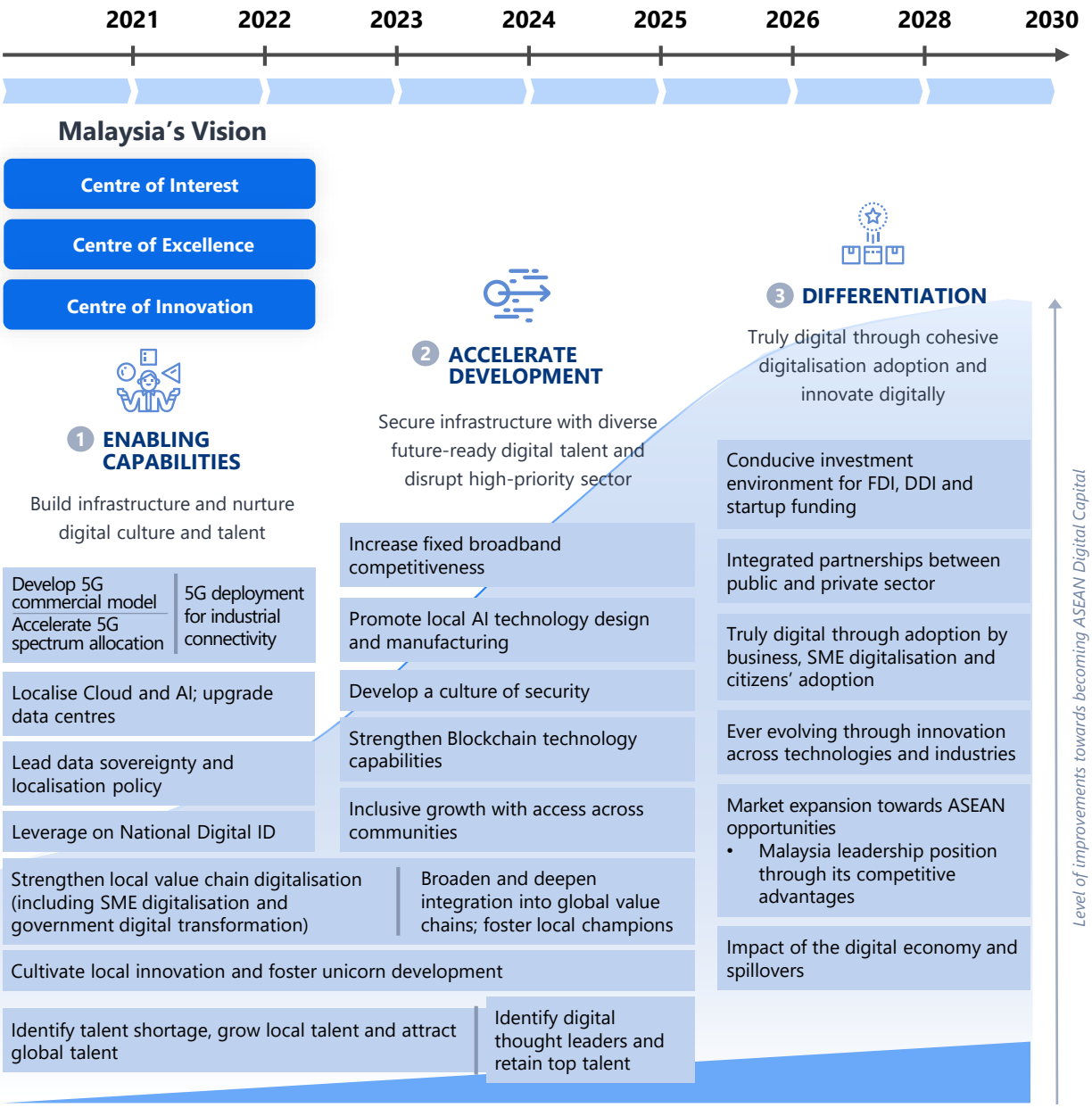
Below is a list of the 10 strategic priorities and focus for policies synchronization:



Phased transformation and priorities for progressive development towards the vision

The digital transformation Building Blocks and key priorities set out in the paper seeks to enable Malaysia's capabilities, accelerate adoption and implementation of critical digital capabilities and ultimately position Malaysia as the preferred Digital Capital in ASEAN. The transformation journey over the next 10 years comprises three developmental phases:

Malaysia's transformation journey in the next 10 years, 2021 to 2030



Transformation driven through clear execution priorities

For the Malaysian transformation to succeed, having a clear collaborative execution plan is important. Investments in digital infrastructure, building trust through right digital security, a future-ready workforce, the digital ecosystem are important prerequisites for sustainable and inclusive digital economy growth and adoption.

Strategising collaborative execution in the four Building Blocks

It is essential that the execution drives towards achieving sustainable outcomes. Hence, a series of execution-focused discussions must take place between the public and private sectors from time to time with considerations of current economy and social conditions and trends, leveraging on the key priorities as a base.

Monitoring is key to develop the positioning

Monitoring of planned initiatives, policies and measures allow Malaysia to measure the progress of its strategy to become ASEAN's Digital Capital. Some of the key monitoring principles for execution and sustainable progress are depicted below:

Drive Effectiveness

Drive **development of the priorities** towards achieving the objective of positioning Malaysia as ASEAN's Digital Capital and **realising the benefits**

Enable Dynamism

Visibility of progress on a **timely basis**, allowing Malaysia to react by adapting the strategy towards achieving the objective

Create Governance

Responsibility and accountability of the various stakeholders in the **execution**; require **effective oversight** and **tight coordination**

Define Measurability

Measurable with a **set of granular level targets/KPIs**; able to **benchmark** with other countries to determine progress and competitiveness

To ensure effective monitoring, a few factors need to be considered:

- **Investment and impact of digitalisation** – The investment from the public sector and expected measurable impact from the initiatives towards the economy, society and businesses
- **Set of measurable KPIs** – The set of granular level KPIs that can measure the progress of initiatives and programmes based on its relevant areas of monitoring
- **Dedicated digital programme** – Governing body coordinates, tracks and monitors the initiatives and strategies towards achieving the positioning

Investment

Impact	Monitoring Area (Non-Exhaustive)		
Economy (focus on base infrastructure, e-businesses and services)	• Level of connectivity • Availability of digital talent	• Technology integration • Digital public and private services	• Market expansion • Active businesses (SMEs and MNCs)
Society (focus on citizens' functions through digital public and commercial infrastructure for conducting life activities)	• Smart infrastructure • Internet penetration • Technology usage in daily activities • e-Government positioning	• Cybercrime levels • Web presence and activity • Usage of online solutions (i.e. e-commerce, online services)	• Technology applications in world performance • Evaluation of online experience
Businesses (focus on digitalisation of business across industries)	• Asset and talent digital spending • Digital business transactions • Work automation • Interactions and transactions between businesses, customers	and relevant services (i.e. suppliers, logistics) • Offline to online conversion • Digital traffic to sales conversion	• Social media presence and performance • Customer engagement • Digital revenue – profit and loss

Dedicated Digital Programme

High Level Monitoring Area	Description and Metrics
Level of Connectivity	The deployment of 5G infrastructure and its quality, access to fast 5G services is a necessary condition for growth and competitiveness for businesses and citizens.

Suggested Metric Level	• 5G implementation
	  • 5G overall coverage
	  • 5G adoption in businesses
	  • 5G adoption in community
	• Speed
	  • Speed vs Areas
	• Affordability and accessibility
	  • Pricing comparison with other countries
	  • Accessibility across different areas and community level

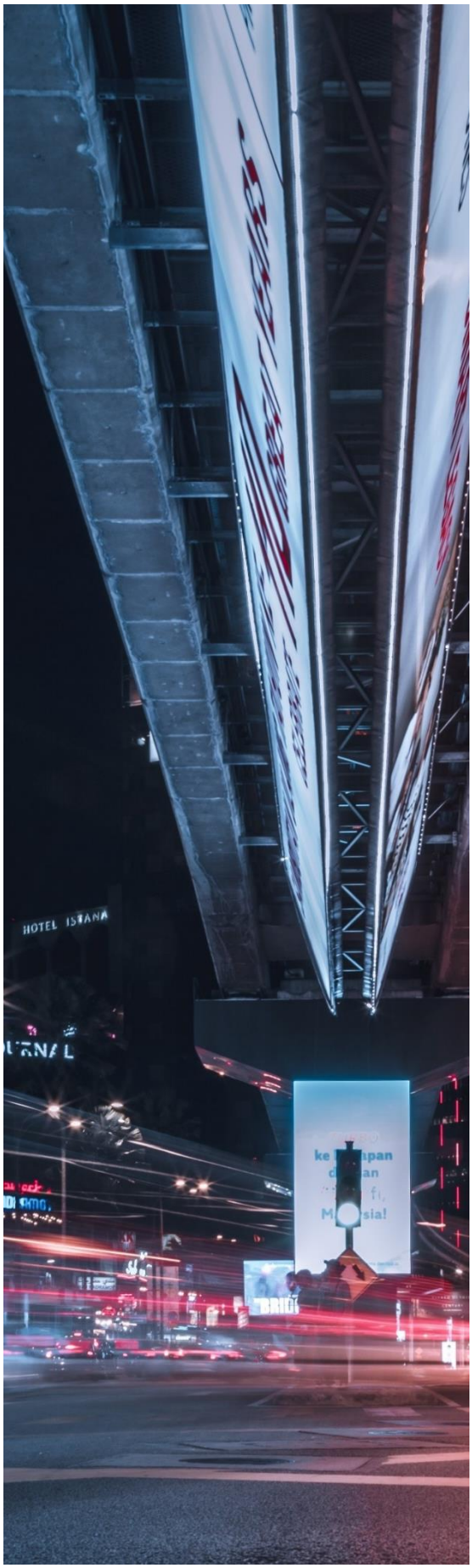
Malaysia forward – as ASEAN's Digital Capital

Positioning Malaysia as ASEAN's Digital Capital provides the country with an ideal opportunity to move towards becoming a high-income and developed economy, and achieve sustainable and inclusive growth. Strong physical and digital infrastructure are important to ensure that Malaysia remains the preferred investment destinations for both domestic and foreign investors.

> Having strong physical and digital infrastructure will ensure that Malaysia is prepared to stride confidently into the future…

Clear and strategic policy directions will allow the country to be a digitally-adept nation, and subsequently productivity increases will continue to propel the growth of the digital economy and uplift the standard of living for all.

Malaysia is strategically well-positioned to be a Centre of Excellence in ASEAN. Achieving this will not only benefit the country, but also the region.



Appendices

Acknowledgements

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Malaysian Communications and Multimedia Commission (MCMC)

Cybersecurity Malaysia (CSM)

Malaysian Research Accelerator for Technology & Innovation (MRANTI)

Cradle Fund Sdn Bhd (Cradle)

MIMOS Berhad

Central Bank of Malaysia (BNM)

National Cyber Security Agency (NACSA)

The National Tech Association of Malaysia (PIKOM)

Malaysia Retailers Association (MRCA)

Collaborative Research in Engineering, Science and Technology Centre (CREST)

1337 Ventures

TIMEdotcom

Abbreviations

2G	2nd Generation
3D	3 Dimensional
3G	3rd Generation
4G	4th Generation
4IR	4th Industrial Revolution
5G	5th Generation
AI	Artificial Intelligence
APAC	Asia-Pacific
APCERT	Asia-Pacific Computer Emergency Response Team
APU	Asia-Pacific University of Technology and Innovation
AR	Augmented Reality
ASDA	Alpha Startups Digital Accelerator
ASEAN	The Association of Southeast Asian Nations
B2B	Business to business
BPMB	Malaysian Development Bank
CCPA	California Consumer Privacy
CIMS	Communication Infrastructure Management System
CIS	Cloud-integrated storage
CLPs	Cable Landing Points
CAGR	Compounded annual growth rate
CX	Customer Experience
DAX	Digital Asset Exchange
DDI	Domestic Direct Investment
DEWA	Dubai Electricity and Water Authority
DIA	Digital Investment Authority
DOSM	Department of Statistics Malaysia
DSL	Digital Subscriber Line
E&E	Electrical and Electronics
EEC	Eastern Economic Corridor
EP	Employment Pass
EPU	Economic Planning Unit
EU	European Union
FBB	Fiber Broadband
FDI	Foreign Direct Investment
FIRST	Forum of Incident Response and Security Teams
FMM	The Federation of Malaysian Manufacturers
FTTH	Fiber-to-the-Home
FWA	Fixed Wireless Access
G42	Group 42
GBS	Global Business Service
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GGC	Google Global Cache
GIS	Geographic Information System
GLC	Government-linked company
GPS	Global Positioning System
GHz	Gigahertz
HR	Human Resources
HRDF	Human Resources Development Fund
IBWPU	International bandwidth consumption per user
ICS	Industrial Control System
ICT	Information and Communication Technologies
IF	Islamic Finance
IHLs	Institutions of Higher Learning
IMDA	Infocomm Media Development Authority
IoT	Internet of Things
ISACA	International System Audit and Control Association
ISV	Independent Software Vendor
JKKPTVET	The TVET Empowerment Cabinet Committee
K-KOMM	Ministry of Communications and Multimedia
KPI	Key Performance Indicator
LTE	Long Term Evolution
Mbps	Megabits per second
MCMC	Malaysia Communications and Multimedia Commision
MCO	Movement Control Order
MCSS	Malaysia Cyber Security Strategy
MDEC	Malaysia Digital Economy Corporation
MeitY	Ministry of Electronics and Information Technoloy India
MHz	Megahertz
MISI	Malaysia Institute for Supply Chain Innovation
MITI	Ministry of International Trade and Industry
MNC	Multinational corporation
MOHR	Ministry of Human Resources
MOSTI	Ministry of Science, Technology and Innovation
MRANTI	Malaysian Research Accelerator for Technology and Innovation
MSME	Micro, Small and Medium Enterprise
MY	Malaysia
NACSA	National Cyber Security Agency
NC4	National Cyber Coordination and Command Centre
NCSP	National Cyber Security Policy
NDID	National Digital Identity

Abbreviations

NDSP	National Data Sharing Policy
NTIS	National Technology and Innovation Sandbox
OECD	Organisation for Economic Cooperation and Development
OIC-CERT	Organisation of the Islamic Cooperation Computer Emergency Response Team
PDP	Department of National Data Protection
PDPA	Personal Data Protection Act 2010
PGI	Protection Group International
PMETs	Professionals, managers, executives and technicians
PoP	Point of Presence
PPP	Public-Private Partnership
QoS	Quality of service
R&D	Research and development
REP	Returning Expert Programme
RFID	Radio-Frequency Identification
RMK-12	12th Malaysia Plan
RP-T	Residence Pass-Talent
SEA	South East Asia
SME	Small Medium Enterprise
SSDLC	Software Development Life Cycle
STEM	Science, Technology, Engineering and Mathematics
TM	Telekom Malaysia
TPM	Technology Park Malaysia
TVET	Technical and Vocational Education and Training
UAE	United Arab Emirates
UK	United Kingdom
USA	United States of America
UX	User Experience
VC	Venture Capital
VR	Virtual Reality
XR	Extended Reality

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