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WORKING PAPER

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8i Ecosystem Analysis of the Maturing ASEAN Country – Malaysia

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Abstract

This paper explores Malaysia's ecosystem and its state of play. Malaysia is a unique country with a rich diversity of cultures and people. Since gaining independence in 1957, Malaysia has undergone a rapid economic transformation, shifting from an agriculture-based economy to one specialising in manufacturing and service sectors. Its strategic location at the heart of Southeast Asia has made it a major exporter of electrical and electronic products to key markets like China, Hong Kong, Japan, and the ASEAN region. As a maturing ASEAN country, in addition to fostering innovation for economic growth, Malaysia is ramping up its efforts to drive digital transformation and transition the nation towards a green economy. Despite significant progress in socio-economic development, the country still faces various challenges that need attention. These include political uncertainty, an absence of a robust collaborative ecosystem involving multiple stakeholders, a significant urban-rural divide in terms of infra- and infostructure development, and a skills mismatch within the labour market, among various other challenges, all of which can pose threats to Malaysia's global competitiveness if left unaddressed. To holistically assess Malaysia's current state of play, this paper utilises the 8i ecosystem framework characterised by eight enablers: institutions, interaction, integrity, infrastructure, infostructure, intellectual capital, incentives, and internationalisation. Following that, this paper concludes with recommendations to address the challenges identified within the 8i ecosystem of Malaysia.

Keywords: Malaysia, the maturing ASEAN country, the current state of play, 8i ecosystem analysis

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1.0 Introduction

Malaysia, the fifth largest country in Southeast Asia and the 19th biggest in Asia, comprises a land area of 330,345 km² and a coastline stretching 4,675 km (Statista, 2022; World Data, 2023). It is divided into two distinct regions: West Malaysia (Peninsular Malaysia), situated on the Malay Peninsula, and East Malaysia, located on the island of Borneo (World Data, 2023). Besides that, Malaysia is made up of 13 states, including Perlis, Kedah, Penang, Perak, Selangor, Negeri Sembilan, Malacca, Johor, Kelantan, Terengganu, Pahang, Sabah, and Sarawak, as well as three federal territories, namely Kuala Lumpur, Labuan, and Putrajaya (World Data, 2023). With a population of over 33 million, this country is well-known for its diverse cultural heritage, which has significantly shaped a multi-ethnic and multilingual society (Al Syahid, 2023). The population is predominantly made up of three main ethnic groups: Malay (69.9%), Chinese (22.8%), and Indian (6.6%), who collectively account for 99.3% of the country's population (Statista, 2022). In terms of the political system, Malaysia is a constitutional monarchy with a parliamentary democracy, in which His Majesty the King (also known as the Yang di-Pertuan Agong) serves as the head of state with primarily ceremonial roles, and the Prime Minister is the head of government with ruling power (Parliament of Malaysia, 2023). The government is democratically selected through a general election held every five years, except in cases where the Prime Minister requests the dissolution of Parliament from Yang di-Pertuan Agong (Chu, 2022).

Since gaining independence in 1957, Malaysia has rapidly transformed its economy from heavily dependent on agriculture and primary commodities, such as tin and rubber, to one specialising in the manufacturing and service sectors. This rapid transformation has enabled Malaysia to position itself as one of the world's major manufacturers and exporters of electronic and electrical products (World Bank, 2022). Additionally, thanks to its strategic

location at the heart of the ASEAN region, Malaysia has emerged as a strategic business hub for multinational corporations and foreign investors seeking to establish their presence in Southeast Asia. This, in turn, has led to the creation of ample job opportunities and a highly diversified economy (Business Today, 2021; The Edge Market, 2021). Diversifying a nation's economy can increase its resilience against potential global economic downturns (Harinderan, 2023). Notably, as a maturing ASEAN country, Malaysia has witnessed the most substantial economic growth in the ASEAN region, achieving an annual increase of 8.7% in its gross domestic product (GDP) in 2022 (Biswas, 2023), a substantial improvement compared to the 3.1% growth recorded in 2021 (The Star, 2023a). Despite this growth, Malaysia still grapples with the persistent challenge of income inequality (World Bank, 2022), particularly between urban areas in Peninsular Malaysia and the rural regions of East Malaysia (Rongen et al., 2021). Nevertheless, the government has implemented targeted measures to address this issue, including distributing financial assistance to low-income households nationwide (World Bank, 2022; Rongen et al., 2021). While it is essential to acknowledge the government's efforts in tackling this issue, a more multifaceted approach is still required to bridge the income gap in the nation effectively.

Besides that, Malaysia has been prioritising its infrastructure development in recent years, particularly by improving its transportation networks by constructing highways and railways across the country. These initiatives have played a crucial role in improving connectivity and driving economic growth in the country (Birruntha, 2022; Woof, 2022). Additionally, Malaysia has invested heavily in its information and communications technology (ICT) infrastructure, ensuring stable and high-speed internet connectivity throughout the country (Adilla, 2022). Despite these achievements, there are still significant disparities in the provision of essential infrastructure, including paved roads, access to clean water and

electricity, healthcare, education, and internet connectivity, particularly in rural areas. This has created a significant urban-rural divide, hindering the country's inclusive growth of socio-economic activities (Ariff, 2021; Yeo, 2020). Furthermore, although the unemployment rate was reduced to 3.6% in 2022 from 5.3% in 2020, skills mismatch remains a significant issue in Malaysia's job market, which can potentially limit the country's ability to attract foreign direct investments (FDI) and compete on a global scale (Department of Statistics Malaysia, 2022; Moh, 2022). As can be seen, although Malaysia has implemented various initiatives to promote its socio-economic growth, there is still a need for the country to continue prioritising economic reforms and invest in essential infrastructure development to expedite the growth of a sustainable and inclusive economy.

To offer a more holistic view of Malaysia's current state of play, this paper conducts an ecosystem analysis of Malaysia, featuring eight key enablers referred to as the "8i enablers", which include institutions, interaction, integrity, infrastructure, infostructure, intellectual capital, and internationalisation. By conducting an 8i ecosystem analysis, this paper helps identify Malaysia's challenges. Subsequently, the analyses identify best practices that can effectively address these challenges and take the nation to greater heights.

2.0 Definitions of the eight enablers in the 8i Innovation Framework

The definitions of the eight enablers in the 8i Innovation Framework are provided below, and a summary of them is shown in Figure 1:

- **Institutions** refer to the quality and strength of the institutional leadership and institutions (e.g., government agencies, research institutes, higher education institutions, industry players) in managing the country's institutional governance systems. These include the existence of effective government and strong "Champions with Clouts" in various sectors to efficiently oversee governance systems and manage the

implementation of policies to enhance the country's competitiveness through the Whole-of-Nation approach.

- **Interaction** encompasses the state of cooperation, collaboration, and knowledge-sharing among the key stakeholders (government agencies, industry players, higher education institutions, and research institutes) in a country. These collaborations are essential to creating a knowledge- and innovation-driven economy characterised by a robust knowledge-sharing culture that fosters the adoption of best practices and innovative systems to strengthen the country's economic competitiveness.
- **Integrity** involves the state of the governance systems at the national, state, and local levels that ensure seamless and efficient implementation of policies, as well as regulatory frameworks that uphold transparency, accountability, and impartiality to promote political stability and socio-economic growth. These include ensuring effective implementation and enforcement of regulations and policies and establishing laws and policies conducive to business activities that promote economic competitiveness.
- **Infrastructure** refers to the state of the natural infrastructure (e.g., environment - lakes, rivers, natural habitats, etc.) as well as knowledge and technology-driven physical infrastructure necessary for a country to function efficiently. Physical infrastructure encompasses public and private systems and services necessary for socio-economic growth and the population's well-being. These include transportation infrastructure (e.g., roads, railways, bridges, airports, seaports, etc.), energy infrastructure (e.g., physical networks of oil and natural gas pipelines, power generation, transmission, and distribution systems), water infrastructure (e.g., water supply and sanitisation systems, wastewater management systems, etc.), and social infrastructure (e.g., healthcare facilities, schools, etc.).

- **Infostructure** captures the state of digital infrastructure, ICT connectivity, and advanced digital technologies to promote the country's economic development and competitiveness. These include innovative technologies such as artificial intelligence systems, big data analytics, blockchain technology, 5G technology and networks, and other digital technologies to ensure cybersecurity and drive innovation development across various industries.
- **Intellectual Capital** encompasses the state of the talent stock in the country. These include the availability and quality of the workforce with primary education and competencies, specialised knowledge, innovation capabilities, technical competencies, as well as entrepreneurial and leadership skills to enhance a country's global competitiveness by fostering a culture of creativity and innovation.
- **Incentives** involve the availability and quality of fiscal and non-fiscal incentives to drive the development of the country's STIE ecosystem. These include incentives to promote a knowledge-sharing culture by strengthening the "quintuple innovation helix", increase local and foreign investments to nurture and develop strong local STI players, promote research and development activities, enable greater access to national research facilities, tax incentives and subsidies for STIE initiatives, as well as taxes and fines to discourage activities that are against the UN-SDG goals.
- **Internationalization** refers to the state of global outreach and international collaboration to promote technology and knowledge transfer, reduce trade barriers, increase market share, and participate in the global value chains. These include participation in free trade agreements and economic partnerships with other countries and adhering to global standards and best practices that enable the country to move up the global value chains.

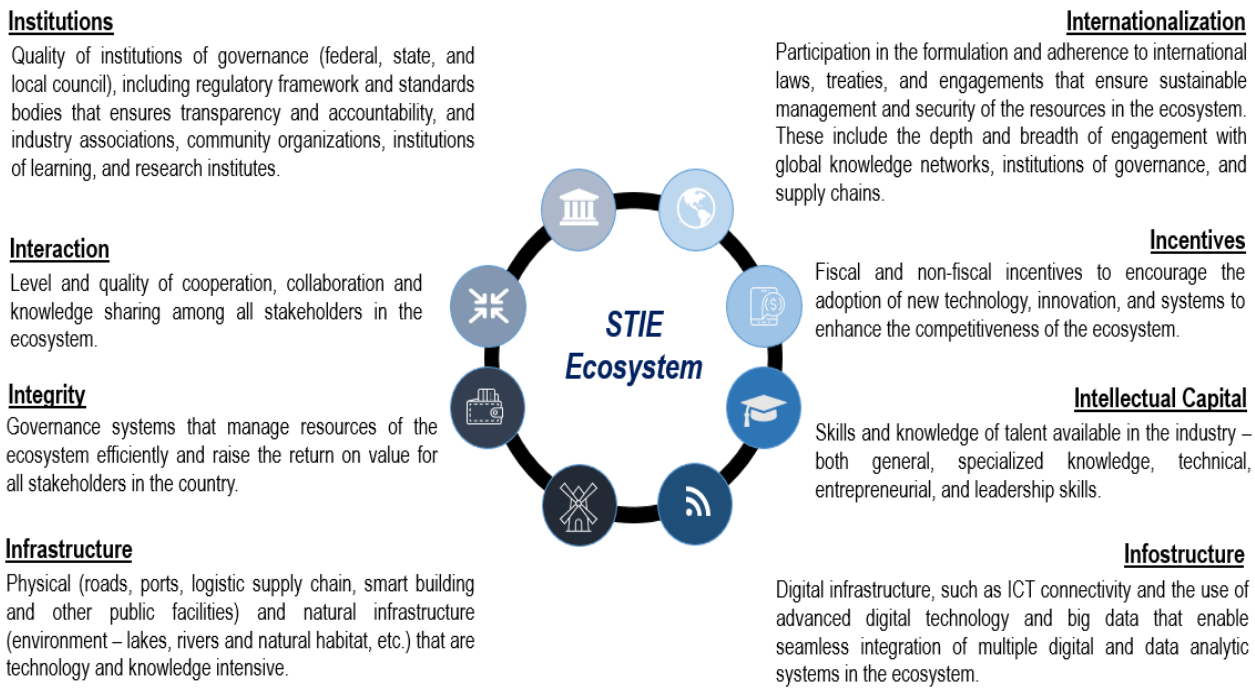


Figure 1. The 8i Ecosystem Framework to assess Malaysia's current state of play

Adapted from Nair (2011) and Nair et al. (2022)

3.0 8i Ecosystem Analysis of Malaysia

Institutions

The effective management of a country's institutional governance systems is vital for its competitiveness in the global market. Competent leaders and strong champions are needed across government agencies, research institutes, higher education institutions, and industry players. Malaysia performs relatively well in government effectiveness compared to other ASEAN countries but lags behind high-income OECD nations. Political instability and corruption scandals have affected the country's government institutions. Other institutions, such as research institutes and universities, face challenges in effectively translating research outcomes into practical applications and generating income. Furthermore, industry players have yet to leverage the R&D expertise and resources in the country fully, hindering the transfer of knowledge and technology. Overall, Malaysia still has room for improvement to strengthen its institutional leadership and governance so as to enhance its competitiveness through the Whole-of-Nation approach.

Interaction

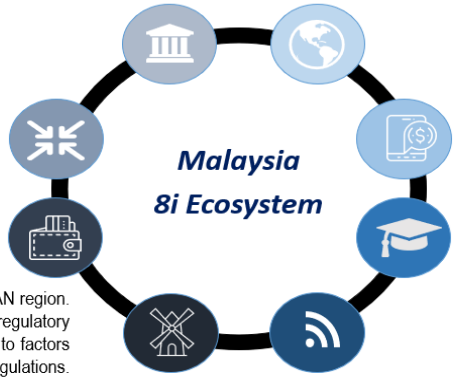
The lack of coordination among government bodies in Malaysia has resulted in fragmented policies and inefficient implementation, leading to challenges in achieving sustainable economic growth. This lack of coordination is evident in multiple areas, such as social assistance, green growth agendas, and essential infrastructure development. In addition, bureaucratic inefficiencies caused by poor coordination have led to delays in implementing policies. While partnerships between TVET institutions and industry partners exist, collaboration between government bodies, public research institutions, higher education institutions, and industry players in R&D remains weak, leading to piecemeal and uncoordinated innovation activities. Improved coordination among all stakeholders is needed to foster a strong knowledge-sharing culture and drive sustainable economic growth.

Integrity

Malaysia has made significant progress in establishing a national integrity system within the ASEAN region. However, there is still room for improvement in areas such as controlling corruption, maintaining regulatory quality, upholding the rule of law, and ensuring political stability. These challenges are attributed to factors such as frequent changes in government, lack of political will, and inadequate enforcement of regulations. Enhancing the effectiveness of policies, ensuring impartiality in the legal administration system, and promoting freedom of expression and media are also critical for Malaysia's development. Despite these challenges, Malaysia provides a relatively favorable regulatory environment for business operations and investments. Foreign investors are allowed to establish and own businesses. Nonetheless, Malaysia needs to continue to take active measures to combat corruption and improve its national integrity system to achieve sustainable socio-economic growth and development.

Infrastructure

The infrastructure quality in Malaysia was rated 78 out of 100 in 2019, which indicates that the country has mediocre infrastructure across various domains like transportation, connectivity, and the supply of electricity and clean water. In order to develop and improve infrastructure projects across the nation, the Malaysian government has allocated a substantial budget of US$20.43 billion for 2023. The Transport Ministry is working on several railway projects to reduce traffic congestion in the country. Peninsular Malaysia houses the largest natural gas pipeline infrastructure in Asia, while Sarawak is planning to establish a hydrogen plant in Bintulu through partnerships. However, there are still challenges that need to be addressed in rural areas, particularly in providing adequate access to clean water and sanitation, as well as proper healthcare and education infrastructure. As can be seen, further action is required to enhance the country's infrastructure, particularly in rural areas.



Internationalization

Malaysia has signed various regional and international free trade agreements to reduce trade barriers and enhance economic integration. These agreements, including CPTPP and the RCEP, provide preferential market access and increase Malaysia's international trade. Malaysia has the highest level of participation in global value chains among middle-income ASEAN countries, particularly in the electrical and electronic (E&E) sector. Its strategic location, business-friendly environment, and skilled workforce have transformed Malaysia into a global production hub for E&E multinational corporations. However, the total exports by the country's SMEs remain limited due to their lack of readiness and capacity to engage in exporting, limited access to foreign markets, and insufficient innovative products and services. More efforts are needed to expand the local economic value chain and move Malaysia up the global value chains to further enhance its socio-economic growth.

Incentives

Fiscal and non-fiscal incentives are vital for driving socio-economic development in Malaysia. Specifically, these incentives are crucial in promoting R&D, green growth, digital transformation, and foreign investment. Incentives like the MESTECC Research & Development Fund and International Collaboration Fund support national and international R&D collaboration efforts. Tax incentives are also provided to accelerate the adoption of electric vehicles and green technologies in Malaysia. Additionally, the Digital Ecosystem Acceleration scheme was launched to incentivize digital technology providers and infrastructure providers, aiming to attract high-quality foreign investments in digital projects. These incentives reflect Malaysia's commitment to building a robust STIE ecosystem and positioning itself as a forward-thinking nation with sustainable practices.

Intellectual Capital

Malaysia's multilingual and diverse workforce provides a strategic advantage in attracting foreign investors and international partnerships. The country's linguistic capabilities have been leveraged by companies like Huawei, which established its first overseas training center in Malaysia's Cyberjaya to deliver programs in English to stakeholders. Additionally, Malaysia houses a number of educational institutions, including universities and TVET colleges, but only 35% of the workforce holds a tertiary degree, posing challenges to innovation and economic growth. Furthermore, Malaysia's talent competitiveness ranking has declined, primarily due to a significant skills gap in the labor market. Additionally, there has been a decline in STEM enrollment, which can hinder STI development. Malaysia is also facing a shortage of digital talent with updated digital tech skills, slowing down digital transformation. To address these challenges, improvements are needed in TVET systems, STEM enrollment, and continuous upskilling and reskilling initiatives.

Infostructure

Malaysia has experienced rapid growth in its digital economy, contributing 22.6% of the GDP in 2022 and projected to reach 25.5% by 2025. To accelerate digital transformation, the government launched the Malaysia Digital Initiative, aiming to attract high-quality digital investments and foster innovation across nine key economic sectors. Despite these efforts, rural areas in Malaysia still face challenges in accessing high-speed Internet. However, measures are underway to improve connectivity in these areas, including the use of satellite and "White Space" radio frequencies. Although 5G networks have been deployed in urban areas, progress in remote regions is slower due to geographical challenges and lower population density. Addressing these infrastructure gaps is crucial to bridging the urban-rural digital divide and promoting inclusive digital transformation for socio-economic development in Malaysia.

Figure 2. The 8i ecosystem analysis of Malaysia

3.1 Institutions

Strong and efficient institutional governance systems are crucial for enhancing a country's competitiveness in the global market. This requires the presence of competent leaders and strong "Champions with Clouts" across various sectors, including government agencies, research institutes, higher education institutions, and industry players. Strong institutional leadership determines the overall success of a country by ensuring its stability, accountability, effective decision-making, and implementation of policies.

In terms of the strength of government institutions, despite facing significant political instability and corruption scandals in recent years (Ministry of Economy Malaysia, 2023), Malaysia still performs relatively better in government effectiveness[1] than other ASEAN countries, following Singapore and Brunei but falls short compared to high-income OECD countries (Ministry of Finance Malaysia, 2022; New Straits Times, 2021). Specifically, Malaysia ranks 37th out of 192 countries on the Government Effectiveness Index (World Bank, 2021). Since the sixth Malaysian Plan (1990 - 1995), various initiatives and institutional reforms have been made to improve productivity in the public sector across all levels of government in the country. Despite these efforts, the persistence of political uncertainty has continued to have a detrimental effect on the performance of the public sector (Ministry of Finance Malaysia, 2022). In many instances, Malaysia's government agencies often struggle to effectively and efficiently execute economic policies, plans, and major projects due to unnecessary red tape (Goh, 2022; Ministry of Economy Malaysia, 2023; New Straits Times, 2021). In addition, ambiguous and unclear standard operating procedures in government agencies have created confusion and dampened the citizens' confidence in government

[1] Government effectiveness is evaluated based on the "perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies" (Kaufman, Kraay, and Mastruzzi 2010, p. 4).

effectiveness (Ministry of Economic Affairs, 2018). Furthermore, civil servants may sometimes face challenges in managing citizen expectations and delivering public services efficiently due to a lack of appropriate technical skills and capacity (Ministry of Economic Affairs, 2018). As a result, in many instances, the waiting time for government services is typically longer than usual, and applications may remain unattended for an extended period (Anis, 2023; Business Today, 2023). As can be seen, Malaysia still has much room for improvement in establishing a strong and effective governance system.

Apart from government agencies, other key players, such as research institutes, higher education institutions, and industry players, also play a crucial role in determining a country's success. Although there have been some improvements in the number of research papers published by public research institutes in Malaysia, they continue to face challenges in effectively translating research outcomes into practical applications. Furthermore, despite the presence of the Knowledge Transfer Programme (KTP) (Universiti Sains Malaysia, n.d.), knowledge transfer activities between public research institutes, universities, and industry players remain limited, as industry players have yet to fully harness the expertise and resources available at the Industry Centres of Excellence (ICoE) of institutes of higher learning in Malaysia (Ministry of Economic Affairs, 2018). As such, public research institutes and universities must enhance their collaboration with industries to promote technology transfer and commercialisation of research outcomes. Besides that, public universities in Malaysia, such as University Malaya and Universiti Teknologi Mara, are less efficient in generating income and managing government operating grants as compared to foreign universities (e.g., Monash University, National University of Singapore, etc.) (Lim et al., 2016). The top three public universities in Malaysia - University Malaya, Universiti Teknologi Petronas, and Universiti Utara Malaysia, were ranked 351 – 500 in the Times Higher Education World

University Rankings 2023 (Times Higher Education, 2023). Other than that, the University Malaya, Universiti Putra Malaysia, and Universiti Kebangsaan Malaysia were ranked 70th, 123rd, and 129th in the QS ranking of Asia's universities (QS Top Universities, 2023). These rankings indicate that these public universities perform modestly in R&D, knowledge transfer, and international outlook (THE, 2023; QS Top Universities, 2023). There are great opportunities for these local universities to enhance their R&D and knowledge transfer activities in Malaysia, thereby increasing the country's global competitiveness.

In short, strong and efficient government agencies, research institutes, universities, and industry players are crucial for developing a country's political systems and socio-economic well-being. While Malaysia has made significant progress in these aspects, there is still ample room for improvement in enhancing its institutional leadership and stewardship, which will further help establish a clear vision and direction to transition the country to a high-income economy.

3.2 Interaction

A resilient and dynamic collaborative ecosystem, marked by extensive cooperation and a culture of knowledge sharing among key stakeholders such as government agencies, industry players, higher education institutions, and research institutes, assumes a critical role in nurturing innovation and driving sustainable economic growth. This collaborative environment facilitates the seamless flow of knowledge, resources, and expertise among various entities, empowering them to capitalise on their respective strengths and collaborate harmoniously towards shared objectives. Consequently, this creates favourable outcomes for the country.

In Malaysia, there exists a tendency for governmental bodies to operate in siloes, resulting in overlapping responsibilities and inconsistent implementation of policies (Ministry of Economy Malaysia, 2023; Rajaendram, 2022). This lack of coordination manifests in

various areas, including the inefficient distribution of social assistance, which leads to fragmented and inadequate social protection systems. Furthermore, the discrepancy between national and state-level environmental policies poses challenges in addressing the country's ecological issues and safeguarding its natural resources (Ministry of Economic Affairs, 2018). Moreover, the absence of effective collaboration between the state and the federal government has hindered the acquisition of funds for essential infrastructure development in rural areas of Sarawak (Tuah et al., 2022). Furthermore, poor coordination among key governance institutions in Malaysia has also resulted in bureaucratic inefficiencies, causing delays in implementing national policies (Ministry of Economic Affairs, 2018; Ministry of Economy Malaysia, 2023). An example is the disconnected efforts between government bodies in managing policies and issues related to foreign worker recruitment, causing a severe shortage of workers and hindering the country's economic development (Adam, 2022). Moreover, during the COVID-19 pandemic, the absence of coordination between different ministries has led to inconsistencies in the implementation of standard operating procedures, causing confusion and frustration among the public and businesses (Fazaniza, 2021; Shamsunahar, 2021). However, formalised collaborations exist between universities and industry players in Malaysia, providing students with opportunities to engage in industrial placements that enrich their practical skills (Ministry of Economic Affairs, 2018; University Kuala Lumpur, 2023). For example, the collaboration between Technical and Vocational Education and Training (TVET) institutions and industry players has produced numerous quality TVET graduates, with more than 10,000 graduates trained by over 100 companies between 2016-2017 (Ministry of Economic Affairs, 2018). Despite these achievements, the R&D collaboration between government bodies, public research institutions, higher education institutions, and industry players remains weak, resulting in piecemeal and uncoordinated research and innovation activities in Malaysia (Ministry of Economic Affairs, 2018). As evidence, the fragmented R&D

collaboration between higher education institutions and industry players is reflected in the country's low score of 53.6 out of 100 on the "University-industry R&D collaboration" index, which is one of the key indicators in the Global Innovation Index (GII) by the World Intellectual Property Organization (WIPO) (WIPO, 2022).

In brief, the need for improved coordination among government bodies in Malaysia cannot be overstated. Moreover, while there are established partnerships between TVET institutions and industry partners in the country, there is still room for improvement in coordinating efforts among government bodies, public research institutions, higher education institutions, and industry players to foster a knowledge and innovation-driven economy characterised by a strong knowledge-sharing culture, which will ultimately strengthen the country's economic competitiveness.

3.3 Integrity

A robust national integrity system is crucial in ensuring the efficient implementation of policies and enforcement of regulations to promote political stability and socio-economic growth. Malaysia has been recognised as having a relatively good national integrity system compared to other ASEAN countries. Specifically, it secured the third position in the region, following Singapore and Brunei, in controlling corruption[2], maintaining regulatory quality[3], and upholding the rule of law[4]. However, Malaysia falls short in performance in these aspects when compared to high-income OECD countries (World Bank, 2021). Besides that, Malaysia

[2] Control of Corruption captures perceptions of the degree to which public authorities use their power for their own personal benefit. This includes both small and large acts of corruption, as well as situations where wealthy and influential groups take control of the government to serve their own interests (World Bank, 2021).
[3] Regulatory quality captures perceptions of the government's effectiveness in creating and enforcing policies and regulations that support and encourage the growth of businesses and industries in the private sector (World Bank, 2021).
[4] Rule of Law refers to how much people trust and follow the rules of society. This includes things like how well contracts are enforced, how property rights are protected, the effectiveness of the police and courts, and the level of crime and violence in a community (World Bank, 2021).

scored 50.94 out of 100 on the political stability and absence of violence/terrorism index (World Bank, 2021). This relatively lower score can be explained by the frequent changes in government since 2018, which has resulted in high levels of political uncertainty in the country (BTI, 2022).

Although substantial efforts have been made to address corruption in Malaysia, the country's position on the Corruption Perceptions Index has worsened since 2019. Specifically, it has slipped from 51st place (among 180 nations) with a score of 53 out of 100 to 61st place with a score of 47 out of 100 in 2022 (Transparency International, 2019, 2022). This low ranking suggests that corruption has become more prevalent in the country (Ministry of Economy Malaysia, 2023). This can be attributed to several reasons, including the lack of political will to tackle corruption at all levels of government, the appointment of underqualified individuals for key positions in government-linked companies, inadequate parliamentary scrutiny of newly proposed national policies, and the negligence in overseeing and addressing cost overruns in public-private partnership projects (Razak, 2023). Nevertheless, the current ruling government is taking active measures to combat corruption in the country as part of a broader effort to attract foreign investors and drive economic growth. Moreover, the Prime Minister, Datuk Seri Anwar Ibrahim, has firmly committed to combatting corruption and preventing abuse of power, highlighting his determination to establish a transparent and accountable government (Ibrahim, 2023).

Besides that, despite securing the third position in the ASEAN region for regulatory quality, Malaysia's score of 72.6 out of 100 highlights the need for significant improvement in enhancing the government's effectiveness in developing and implementing sound policies (World Bank, 2021). Inadequate implementation of policies and enforcement of rules has hampered the realisation of national policies, making it challenging to identify areas that

require improvement in Malaysia (Ministry of Finance Malaysia, 2022). For example, the Malaysia Wawasan 2020, established in 1991, was an ambitious long-term vision to achieve various national goals and transform Malaysia into a high-income nation by 2020 (Jamal, 2021). Unfortunately, a high degree of political polarisation and inconsistencies between the envisioned goals and the strategies implemented have significantly hindered the plan in addressing the nine outlined challenges. As a result, Malaysia could not achieve all the goals set out in the Wawasan 2020 plan (Jamal, 2021). Furthermore, there are certain degrees of restrictions on freedom of expression in Malaysia, especially in the media. There have been instances where journalists and reporters have been called in by the police for criticising government officials and the judiciary (Freedom House, 2022; Human Rights Watch, 2021).

Additionally, the current legal administration system lacks impartiality as the Attorney General and Public Prosecutor share the same duties, making it susceptible to political influence. Separating the power of these two roles would help improve public confidence and trust in Malaysia's legal and administrative institutions (Ministry of Economic Affairs, 2018; Sinar Daily, 2023). Besides, although foreign entities can establish and own businesses in Malaysia, they must adhere to specific regulations. For example, local equity participation is required when applying for operating licenses and permits. Specifically, foreign investors may own a maximum of 70% of the equity, while at least 30% must be held by Bumiputera entities (e.g., ethnic Malays and indigenous people) (U.S. Department of State, 2021). Despite this limitation, Malaysia ranks 12th out of 190 countries on the Ease of Doing Business Index, scoring 81.5, suggesting that the regulatory environment is relatively conducive to business operations and investments (World Bank, 2019).

As can be seen, although Malaysia has made significant progress in strengthening its national integrity system, efforts are still needed to establish a robust and comprehensive

system that effectively addresses corruption, ensures the effective implementation of sound policies, and promotes transparency, accountability, and good governance at all levels of society.

3.4 Infrastructure

A strong emphasis must be placed on developing a robust infrastructure to ensure the population's overall well-being and foster rapid socio-economic growth in the country. This involves developing efficient transportation systems, establishing extensive energy and water infrastructure, and providing top-notch social infrastructure such as healthcare and education facilities. These infrastructures collectively contribute to a nation's inclusive development and enhance the population's quality of life by granting them access to basic necessities and essential services.

Malaysia scored 78 out of 100 on the Infrastructure Quality Index[5] (World Economic Forum [WEF], 2019). This ranking highlights Malaysia's mediocre infrastructure quality across various domains, including air, sea, and land transportation, as well as connectivity and the supply of electricity and clean water (WEF, 2019). Recognising the importance of infrastructure in national economic development, the Malaysian government has allocated a substantial budget of US$20.43 billion for 2023, which involves developing and improving 7,615 infrastructure projects across the nation (Woof, 2022). Specifically, a significant portion of the budget will be dedicated to improving the road infrastructure in Sabah, with a particular focus on the development of Phase 1b of the Pan Borneo Sabah Highway. Additionally, substantial investments will be made to upgrade the infrastructure in rural areas across

[5] Infrastructure quality is evaluated against these indicators: road connectivity index, quality of roads, railroad density, efficiency of train services, airport connectivity, efficiency of air transport services, linear shipping connectivity index, efficiency of seaport services, electrification rate, electric power transmission and distribution losses, exposure to unsafe drinking water, and reliability of water supply (World Economic Forum, 2019).

Malaysia, which help ensure improved connectivity and accessibility for the rural communities (Woof, 2022). Besides that, with 75% of Malaysia being urbanised, Malaysia requires efficient public transportation infrastructure to ease traffic congestion caused by a high number of vehicles. Therefore, the Transport Ministry has outlined plans to complete railway projects, such as the East Coast Rail Link (ECRL), Light Rail Transit 3 (LRT3), and Mass Rapid Transit 3 (MRT3) by 2026, 2027 and 2030, respectively (Birruntha, 2022).

Regarding energy infrastructure, Malaysia possesses Asia's largest domestic natural gas pipeline infrastructure. However, it is primarily concentrated in Peninsular Malaysia, with a 1530-mile natural gas pipeline that caters to domestic demand. Sarawak and Sabah have poor gas distribution coverage, which has limited the utilisation of natural gas in these regions (Mordor Intelligence, 2023). Nevertheless, to promote sustainable energy consumption, Sarawak envisions becoming a hydrogen hub in Malaysia and even Asian regions, aiming to be a leading player in the hydrogen economy by 2028 (Dayak Daily, 2022; Lye, 2022). For example, through the H2biscus Green Hydrogen project, the Sarawak government has partnered with corporations from South Korea (e.g., Samsung Engineering Co Ltd, Posco, and Lotte Chemical) to jointly develop a hydrogen plant in Tanjung Kidurong at Bintulu, Sarawak, which upon completion, will generate 220,000 tonnes of hydrogen annually, catering to the needs of industries in both Malaysia and South Korea (Ten, 2022). This initiative will help create a more sustainable and greener energy system in the region by 2050 (Wong, 2022). With regard to water infrastructure, according to the latest available data from the World Bank (2023), 94% of the population in Malaysia had access to clean water supplies as of 2020, and 77% had access to hygienic sanitation services as of 2018. These statistics indicate that substantial efforts have been made to improve water infrastructure in Malaysia. Although Malaysia's water infrastructure is recognised as one of the most established in Southeast Asia

(Leong, 2018), it still faces significant challenges in addressing various issues related to water pollution, meeting the escalating water demand from businesses and domestic consumers, and providing adequate access to clean water and sanitation for rural communities (Daniele, 2023; Maniam et al., 2021; The Borgen Project, 2020).

In terms of social infrastructure, healthcare facilities (e.g., hospitals, clinics, etc.) are mainly concentrated in urban areas of Malaysia, inadvertently neglecting the healthcare needs of communities in rural areas (Khazanah Research Institute, 2020; Ministry of Economy Malaysia, 2023). Therefore, rural communities often need to travel a long distance on unpaved roads to access healthcare facilities in towns (Falcon, 2019; The Borneo Post, 2023). Moreover, nearly half of the clinics in rural areas, particularly in Sabah and Sarawak, suffer from a shortage of doctors, thus impeding the delivery of high-quality healthcare services to rural communities (Batumalai, 2020). Similar to healthcare infrastructure, school infrastructure and facilities in rural areas of East Malaysia are generally dilapidated and poorly maintained, which has resulted in unfavourable learning environments detrimental to educational outcomes. Unfortunately, the lack of proper school infrastructure in rural areas has significantly exacerbated the urban-rural education gap in Malaysia (Aiman, 2021; Yeo, 2023). Furthermore, obsolete school infrastructure, such as decrepit science labs and the lack of modern learning equipment, has impeded the integration of STEM education in schools, leading to a decline in STEM enrolment in Malaysia (Ismail et al., 2019; Ramli & Talib, 2017).

Despite Malaysia's relatively good performance on the Infrastructure Quality Index (WEF, 2019), further action is required to enhance the country's infrastructure, particularly essential facilities in rural areas. This involves improving the road infrastructure, access to clean water and sanitation, healthcare services, and educational infrastructure, which are vital

to promoting overall social well-being and fostering inclusive economic growth throughout the nation.

3.5 Infostructure

Digital infrastructure, ICT connectivity, and advanced digital technologies are crucial in promoting a country's economic competitiveness in the global digital economy. In Malaysia, the digital economy is one of the rapidly growing sectors, contributing approximately 22.6% to the country's GDP in 2022. Projections show that this percentage is expected to increase to 25.5% by 2025 (Gomes, 2022). This growth is driven by the rapid digital transformation stemming from the revolution of key digital technologies in Malaysia, such as cloud technology, robotics, artificial intelligence, big data analytics, cybersecurity, blockchain, financial technology (FinTech), the Internet of Things, etc. (International Trade Administration, 2023). In a bid to boost the growth of the digital economy in Malaysia, the government launched the Malaysia Digital Initiative in July 2022. This digital economy initiative aims to accelerate the adoption of digital technologies in private and public sectors, particularly in nine key economic sectors, including trade, agriculture, services, cities, health, finance, content, tourism, and the Islamic digital economy (Gomes, 2022). In addition to fostering innovation and digitalisation, this initiative will help attract high-value digital investments and promote economic growth across the nine sectors while improving the population's quality of life across the nation (Aziz & Vethasalam, 2022; Gomes, 2022). As a testament to Malaysia's robust digital economy, Amazon Web Services (AWS) has recently announced a significant investment of around RM25.5 billion towards building a state-of-the-art cloud computing infrastructure in the country, with an expected completion date of 2037 (Malaysian Investment Development Authority [MIDA], 2023). This transformative initiative allows Malaysian users to store data securely with lower latency. It is anticipated to unlock ample business opportunities through

cloud-based technologies, accelerating the digitalisation process across various industries in the country. This, in turn, will help attract a substantial influx of digital investments and strengthen Malaysia's position as a leading data centre market in the ASEAN region (Reuters, 2023; Sharon, 2023).

In terms of ICT infrastructure, Malaysia was ranked 36th out of 133 countries on the ICT Infrastructure Index, a sub-pillar of the Network Readiness Index (Lanvin & Monteiro, 2022). This ranking highlights that Malaysia still has significant room for improvement in its ICT infrastructure, which incorporates various aspects, such as internet accessibility, coverage of at least a 3G mobile network among the population, Internet bandwidth, and Internet access in schools (Lanvin & Monteiro, 2022). Specifically, rural communities, particularly in remote areas of East Malaysia, continue to face significant challenges in accessing high-speed Internet as it remains largely confined to urban areas. As a result, the poor Internet connection has restricted students and educators from fully participating in virtual learning and teaching in these areas, widening the education gap between rural and urban areas in Malaysia (Supramani, 2020; The Sun Daily, 2022). However, the Communications and Digital Minister has recently announced plans to improve the ICT infrastructure in rural areas by utilising advanced technologies, such as satellite and "White Space" radio frequencies, to improve internet accessibility in these underserved regions (Malay Mail, 2023). Besides that, as of September 2022, Malaysia has successfully rolled out 5G networks in eight states, including Kuala Lumpur, Putrajaya, Selangor, Negri Sembilan, Melaka, Johor, Penang, and Sabah (Hanif, 2022). By March 2023, Malaysia had achieved 5G coverage in 55% of its urban areas. Moving forward, the country aims to expand 5G coverage to 80% of its major towns before 2024 (Ignatius, 2023). However, 5G deployment progress in remote areas is expected to be much slower due to geographical challenges and lower population density. The costs and efforts may

hinder authorities from establishing the necessary ICT infrastructure for deploying 5G networks in these areas (Malaysian Communications and Multimedia Commission, 2023; Teoh, 2023).

In brief, although substantial efforts and investments have been made to develop and enhance infostructure in the country, Malaysia still faces hurdles in ensuring universal access to high-speed internet connection and 5G networks. Therefore, more effort is required to improve ICT infrastructure, such that it helps address the urban-rural digital divide, promote inclusive digital transformation, and consequently promote socio-economic development across the country.

3.6 Intellectual Capital

To foster innovation and enhance a country's economic competitiveness, it is essential to cultivate a diverse pool of talent equipped with specialised knowledge, innovation capabilities, technical competencies, and leadership skills. Malaysia has a diverse and multilingual workforce that helps to catalyse international partnerships, attracts multinational corporations, and instils confidence among foreign investors (Khalid, 2022; MIDA, 2021a). For example, in 2012, Huawei established its first overseas training centre in Cyberjaya, strategically capitalising on the diverse linguistic capabilities of the local workforce to deliver training programs to their stakeholders in the English language (MIDA, 2021a). This training centre has successfully equipped over 10,000 individuals in Malaysia's ICT sector with the latest technological knowledge and skills in 5G and cloud computing (MIDA, 2021a). Other than that, Malaysia is home to 20 public universities, 53 private universities, and over 1,400 technical and vocational education and training colleges (TVET), collectively contributing to a skilled workforce across various industries in Malaysia (MIDA, 2022a). Despite possessing a wealth of educational institutions, merely 35% of the workforce hold a tertiary degree,

whereas 67% have completed secondary education (Lanvin & Monteiro, 2022). This indicates that only one-third of the labour force in Malaysia is composed of highly skilled workers, posing significant challenges to the country's innovation and economic growth (Lanvin & Monteiro, 2022).

According to the Global Talent Competitiveness Index (GTCI), Malaysia's ranking on talent competitiveness has fallen by 11 spots, from 34th in 2021 to 45th in 2022 (Lanvin & Monteiro, 2021, 2022). GTCI is assessed based on two key pillars: the Input model and the Output model. The Input model focuses on a country's capacity to attract, grow, retain, and enable talent. Meanwhile, the Output model measures the quality of talent produced as a result of the initiatives outlined in the Input model, specifically in terms of Vocational and Technical Skills (mid-level skills) and Global Knowledge Skills (high-level skills) (Lanvin & Monteiro, 2022). Malaysia's decline in GTCI ranking can be primarily attributed to "a dramatic drop in business sentiment" (Lanvin & Monteiro, 2022, p. 40). For instance, the private sector has observed a decline in employability among the workforce in Malaysia due to the presence of a significant skills gap (Lanvin & Monteiro, 2022). This skills gap is a critical factor impacting the "Vocational and Technical Skills" aspect of the GTCI model. In other words, it indicates a severe mismatch between the technical skills possessed by the workforce and the specific skills required by industrial sectors in Malaysia (Lanvin & Monteiro, 2022). Consequently, this has led to a high unemployment rate among graduates (Muhamad, 2023; Singh, 2022). As evidence, nearly 20% of local graduates face challenges securing employment within six months after graduation (Ho, 2021). This highlights the need for further improvement in the country's Technical and Vocational Education and Training (TVET) systems.

In addition to skills gaps, there has been a substantial decline in the Science, Technology, Engineering, and Mathematics (STEM) enrolment in schools and higher

education institutions in Malaysia (New Straits Times, 2020, 2021). As evidence, the percentage of students pursuing pure science within the STEM field stood at 20.5% as of 2020, far below the expected 60% STEM enrolment rate in the country (New Straits Times, 2021). This worrisome situation poses significant challenges in building a talent pool needed in STEM-related industries, ultimately hindering the country's science, technology, and innovation (STI) development and negatively impacting its global competitiveness (New Straits Times, 2021). Furthermore, Malaysia is also experiencing a shortage of digital talent with the appropriate digital tech skills and knowledge, which can slow down digital transformation in the country (Jaafar, 2021; The Edge Malaysia, 2022). According to the 2022 Digital Talent Insight report by Huawei (2022), this shortage can be partially attributed to local institutions excessively prioritising niche courses based on their perspectives of current trends without taking into account in-demand digital skills in the global economy. Consequently, graduates in specialised fields like cybersecurity or software development often struggle to secure relevant internships in the job market (Huawei, 2022). As such, continuous upskilling and reskilling are essential to ensure that the workforce stays abreast of the constantly evolving digital trends, thereby bridging the digital skills gap in Malaysia (The Edge Malaysia, 2022).

Overall, despite the presence of numerous educational institutions in Malaysia, significant efforts are still required to develop and nurture industry-ready talent in the country. Minimising skills mismatch and achieving a high STEM enrolment rate are crucial to improving Malaysia's ranking in the Global Talent Competitiveness Index. By building a strong talent pool equipped with relevant skills and knowledge, Malaysia can effectively cultivate an innovation-driven, knowledge-based economy, strengthening its competitiveness in the global economic landscape.

3.7 Incentives

Fiscal and non-fiscal incentives are pivotal in stimulating socio-economic development in a country. Effective allocation and implementation of incentives, such as grants, subsidies, tax breaks, exemptions, and deductions, can help catalyse research and development initiatives, promote a knowledge-sharing culture among key players, drive the growth of the green economy, foster the adoption of digital technologies, and attract foreign investors to boost economic growth and nurture a strong talent pool in the nation. These incentives can help cultivate the country's Science, Technology, Innovation, and Economy (STIE) ecosystem.

In terms of R&D incentives, the Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC) has introduced the MESTECC Research & Development Fund to promote R&D and commercialisation of research outcomes in areas such as water-food-energy nexus, green growth for sustainable development, and medical and healthcare (MIDA, 2019). Specifically, this research fund intends to foster a knowledge-sharing culture by strengthening cross-collaboration between local industry players (mainly small and medium companies), higher education institutions, public research institutions, and government agencies (MIDA, 2019). Funding will be determined based on each application's merits and potential impacts, up to a maximum limit of RM3,000,000.00 over 24 months (MIDA 2019). In addition to local R&D efforts, MESTECC has established the International Collaboration Fund (ICF) to foster international R&D efforts and collaboration among local and foreign researchers on science, technology, and innovation (STI) projects across different sectors. This includes computer science and ICT, biotechnology, engineering and technology, agriculture and forestry, as well as medical and health sciences. In particular, researchers who meet specific qualifications are eligible for funding up to RM500,000 for a maximum of 24 months (MIDA, 2019). Working alongside international researchers enables Malaysia to tap

into its specialised skills and knowledge to strengthen local R&D capabilities and boost its global competitiveness.

To expedite the transition towards a green economy, more incentives are introduced under the revised national Budget 2023 to accelerate the adoption of electric vehicles (EV) to effectively reduce carbon emissions in Malaysia (The Star, 2023b). To incentivise the local assembly and sale of EVs, the government has extended the deadlines for various tax exemptions. For example, an extension of two years has been granted for the exemption of import duty on components used in locally assembled EVs and exemptions on sales tax for locally assembled EVs and excise duty for imported EVs (Wong, 2023). In addition, EV owners in Malaysia enjoy several benefits, including road tax exemption and a personal income tax exemption of up to RM 2,500 for expenses associated with EV charging equipment and services (Koty, 2022). These incentives drive Malaysia closer to achieving its Low Carbon Nation Aspiration target of the New Energy Policy (2022 – 2040), aiming to have electric vehicles (EVs) accounting for 38% of the total industry volume by 2040 (MIDA, 2021b). Other than that, in line with the Green Technology Master Plan 2017-2030, various Green Technology Tax Incentives (GTTI) have also been initiated to encourage the adoption of green technologies by industry players (Voon & Chong, 2022). GTTI comprises two broad categories of green incentives: 1) Green Investment Tax Allowance (GITA)[6], which offers tax allowance for companies with qualifying green technology assets (e.g., EV charging equipment, biomass gas engines, plastic recycling machines, etc.) and projects (e.g., biomass, geothermal, solar power, etc.) for business purposes; and 2) Green Income Tax Exemption (GITE)[7], which is

[6] Companies qualified for GITA are given a 100% investment tax allowance for capital expenditures related to eligible green activities over an extended period of time, with a maximum deduction of 70% from statutory earnings (Voon & Chong, 2022).
[7] Companies approved for GITE can enjoy a 70% income tax exemption on their statutory income for a duration ranging from three to ten years (Voon & Chong, 2022).

available for green technology service providers and investors of solar photovoltaic systems (Voon & Chong, 2022). These green incentives highlight the government's commitment to propelling the nation toward a green economy.

To accelerate digital transformation in Malaysia, the government launched the Digital Ecosystem Acceleration (DESAC) scheme in 2021, aiming to provide a wide variety of incentives to digital technology providers (DTPs)[8] (e.g., cloud computing services) and digital infrastructure providers (DIPs)[9] (e.g., data centres) in the country (Malaysia Digital Chamber of Commerce [MDCC], 2021). By offering these incentives, the government aims to foster digital adoption across various sectors in Malaysia, attract foreign investments in digital projects, and establish a strong value chain within the local digital economy, which simultaneously helps generate ample high-skilled employment opportunities in Malaysia (MIDA, 2022b). Besides that, several tax incentives have also been introduced to attract FDI in the local manufacturing sector. For example, foreign investors who commit a minimum capital investment of RM300 million become eligible for a tax holiday lasting between 10 and 15 years (Bernama, 2021). Doing so facilitates technology transfer and promotes a knowledge-sharing culture in the local manufacturing sector, ultimately bringing Malaysia up the global value chains.

As can be seen, Malaysia's dedication to building a robust STIE ecosystem is exemplified through various fiscal and non-fiscal incentives. This proactive approach not only expedites R&D and innovation but also promotes green growth and digital transformation, as well as attracting high-value FDI into the country. That is to say, these incentives allow

[8] DTPs are entitled to an income tax rate of up to 10% (MDCC, 2021).
[9] DIPs are granted a 100% investment tax allowance on capital expenditures, which can be used to offset up to 100% of the statutory income for a maximum period of ten years (MDCC, 2021).

Malaysia to position itself as a forward-thinking country while also reaping the economic benefits that come with sustainable practices.

3.8 Internationalization

Internationalisation enables countries to expand their market share and increase global outreach. This facilitates technology and knowledge exchange among countries while building a more substantial presence in worldwide value chains to strengthen their economic competitiveness.

Malaysia has been proactive in signing various regional and international free trade agreements (FTAs) to reduce trade barriers with member countries, improve trade flows and market access, and enhance economic integration with other countries (Abu & Bahari, 2020). Similar to Singapore and Brunei, Malaysia is a member of both the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Regional Comprehensive Economic Partnership (RCEP) (Abu & Bahari, 2020). Officially ratified by the Malaysian government on September 30, 2022, the CPTPP enables Malaysia to have preferential access to the markets of the ten other member countries, including Australia, Brunei, Canada, Chile, Japan, Mexico, New Zealand, Peru, Singapore, and Vietnam (Fox, 2022). Besides eliminating 95% of tariffs between the 11 member states, the CPTPP is predicted to elevate Malaysia's overall trade from US$481 billion in 2021 to US$655.9 billion in 2030 (Fox, 2022). This international partnership will also help attract foreign investors and cultivate a larger pool of highly skilled talent within Malaysia, thereby enhancing the country's economic competitiveness in the global market (MIDA, 2022c). On the other hand, the RCEP grants Malaysia access to 30% of the world's population (Petri & Plummer, 2020) and is projected to increase the country's total export revenue by an estimated US$200 million (Ians, 2022). Specifically, it offers Malaysia's Small and Medium Enterprises (SMEs) the

opportunity to benefit from reduced trade tariffs and expanded regional supply chains, strengthening their competitive advantage in the global economy (SME Corp Malaysia, 2022). In addition to FTAs, Malaysia also benefits from the ASEAN Economic Community (AEC), which provides opportunities for cross-border investment and collaboration, regulatory harmonisation of standards, and talent exchange across the ASEAN region (Abu & Bahari, 2020).

Besides that, Malaysia has the highest level of participation in global value chains (GVCs) among the middle-income ASEAN countries, exceeding the ASEAN average and second only to Singapore. It has similar levels of involvement in both the backward (29%) (foreign value added) and forward linkages (36%) (domestic value added) of the GVCs (ASEAN-Japan Centre, 2019; Lim & Tng, 2017). Due to its domestic inputs and capabilities in developing technology, Malaysia plays a crucial role in producing and exporting electrical and electronic (E&E) components at both regional and international levels, accounting for more than 30% of the country's domestic value-added (DVA) exports (ASEAN-Japan Centre, 2021). Specifically, Malaysia's key trading partners for E&E exports involve Singapore, Hong Kong, the USA, China, Japan, and Europe (MIDA, 2021c). With ongoing efforts to attract high-value foreign investments, Malaysia's E&E sector is projected to contribute approximately RM120 billion to the nation's GDP and generate export earnings of about RM495 billion by 2025 (New Straits Times, 2022). Due to its strength in the E&E sector, Malaysia has emerged as a global production hub for E&E multinational corporations (MNCs), such as Texas Instruments, Intel, Bosch, and Osram. This achievement can also be attributed to the country's strategic location in the heart of the ASEAN region, its business-friendly environment, and its skilled, multilingual workforce (MIDA, 2021c; Zulkifli, 2022). In addition, other MNCs like VINCI Construction and Oleon Sdn Bhd have also established partnerships with local universities to

drive R&D and innovation activities in Malaysia, aiming to advance the innovation-driven, knowledge-based economy of the country (Zulkifli, 2022). In essence, the presence of these MNCs has brought multiple advantages to the country, including the creation of ample high-value job opportunities, the transfer of specialised knowledge and cutting-edge technology, the development of a highly skilled workforce, and the expansion of local supply chains (MIDA, 2021c; Zulkifli, 2022).

Although Malaysia has established a strong presence in the GVCs due to its great potential in the E&E manufacturing sector, small and medium enterprises (SMEs) in the country have yet to fully capitalise on this potential and maximise export sales through this channel. Therefore, the total SMEs' export volumes remain limited, hindering their ability to scale up their businesses and remain competitive in the global market (Ministry of Economy Malaysia, 2023). This can be attributed to various factors, such as the SMEs' limited capacity and immaturity with exporting, limited access to overseas markets, a lack of innovative products and services suitable for export, and non-compliance with global standards (Ministry of Economic Affairs, 2018). Therefore, Malaysia must address the challenges that prevent SMEs from actively participating in global value chains. One effective approach would be establishing partnerships with multinational corporations and adhering to internationally recognised standards (Zulkifli, 2022). Overall, although Malaysia's proactive approach to internationalisation has enabled it to become a competitive player in the global economy, more effort is necessary to expand the local economic value chain and move Malaysia further up the global value chains, ultimately accelerating the country's socio-economic growth.

4.0 Summary Evaluation

Summing up, although Malaysia has achieved significant social and economic growth progress, several areas still warrant further improvement through concentrated efforts. First,

Malaysia's political environment has been unstable due to frequent changes in government. However, with the election of a new government, it is optimistic that the country can progress toward a more transparent and accountable governance system. Such a system can enhance investor confidence and foster socio-economic growth. Besides that, there is an absence of a robust collaborative ecosystem involving government agencies, industry players, universities, and research institutes. This lack of cooperation hinders the development of smart partnerships, crucial for high-value-added economic activities that can move Malaysia up the global value chains. Moreover, there is a significant urban-rural divide in infrastructure development, with most investments directed towards improving and building high-quality physical and ICT infrastructure in urban areas, resulting in a lagging rural development.

Besides, STEM enrolment in Malaysia has been relatively low in recent years, raising concerns about the availability of skilled workers for STEM industries. This shortage can negatively impact the country's economic development and competitiveness in the global value chains. Skills mismatch is another significant challenge that warrants further attention in Malaysia's job market. Despite having a degree or qualification, many young graduates in the country face difficulty finding employment due to a mismatch between their skill sets and the job market demands. Addressing this issue is crucial to reducing the unemployment rate among youth in Malaysia, which is also vital for the country's economic growth. In light of the challenges mentioned above, there is a need for Malaysia to take further steps and implement effective strategies to improve its political climate and socio-economic growth, which is essential to realising its vision of becoming a high-income nation. The following section presents several recommendations based on the issues and challenges identified within the 8i ecosystem of Malaysia.

5.0 Recommendations

To strengthen national resilience and promote more inclusive and sustainable socio-economic growth, there is an urgent need to address the challenges and shortcomings that have been identified from the 8i ecosystem analysis of Malaysia. With this, this paper puts forth four recommendations, as presented below.

Recommendation 1: Strengthen institutional leadership and stewardship to oversee the efficient implementation of plans and policies and enforce rules.

It is crucial to put in place a number of essential measures in order to establish a robust governance system. Firstly, appointing political leaders based solely on qualifications should be prioritised over personal ties or networks. This approach ensures that only individuals possessing relevant merits and expertise are assigned key leadership positions, leading to improved decision-making and bureaucratic performance.

To build public trust in the government, it is necessary to adopt and impose more stringent regulations and laws, which help tackle corruption and the misuse of power. Although establishing stringent laws is important, without strict enforcement, laws become mere words on paper, lacking the power to maintain order and protect rights. Hence, the government must allocate resources, develop competent enforcement agencies, and implement mechanisms that ensure the enforcement of laws to uphold integrity, transparency, and accountability.

Furthermore, it is imperative to devise realistic and practical strategies and policies to ensure the successful execution of plans. This involves ensuring the availability of necessary resources and budgets as well as setting feasible timelines and action plans that can help efficiently achieve the intended targets and goals. Lastly, harmonising the envisioned goals with the formulated strategies is also pivotal to achieving timely and successful outcomes. This requires

effective communication and coordination among all relevant stakeholders, along with a dedicated commitment to the devised goals and strategies.

Recommendation 2: Establish a robust collaborative ecosystem involving government agencies, industry players, universities, and research institutions in the country.

There is a need to strengthen further the Whole-of-Government approach to improve cooperation and coordination among government bodies in Malaysia. Whole-of-Government is a collaborative approach involving multiple government agencies working together to develop policies and deliver public services towards achieving shared and interdependent goals (Christensen & Lægreid, 2007). Strong institutional leadership and stewardship are essential in ensuring an effective Whole-of-Government (United Nations, n.d.). In other words, a capable political leader plays a pivotal role in establishing a clear direction and mobilising other political constituents toward shared goals, ultimately leading to the seamless and efficient implementation of policies. Besides that, it is important to establish a special committee that can oversee and effectively coordinate the roles of various ministries, streamlining their functions and avoiding duplication of efforts. Doing so can ensure optimal resource allocation across multiple government agencies, thereby improving efficiency at all levels of government (local, provincial, and national) (Basyir, 2021; United Nations, n.d.).

In addition, a more effective Whole-of-Society approach is needed to create a robust collaborative ecosystem that brings together various stakeholders from different sectors (e.g., government agencies, industry players, research institutes, higher education institutions, etc.) in Malaysia to work together towards a common goal. This involves promoting strategic and smart partnerships that feature knowledge and technology transfer activities, which are crucial to driving research and innovation in the country. First, it is of utmost importance for relevant stakeholders to establish shared goals based on common interests and demonstrate strong

commitments to achieve them. In doing so, stakeholders can leverage each other's expertise and resources to achieve common objectives. Further, to promote long-term and effective multi-stakeholder collaboration, the Malaysian government can establish an enabling environment with a streamlined administrative procedure that promotes smart partnerships in the nation (Kindornay & Kocaata, 2019; Tan, 2021). This may involve the creation of dedicated platforms and initiatives to facilitate knowledge and technology transfer activities between stakeholders (Tan, 2021). The government can also develop and enhance existing regulatory frameworks and policies to further incentivise collaboration and partnerships across sectors in the country (Kindornay & Kocaata, 2019). Most importantly, the effective implementation of policies and execution of action plans is the key to achieving a robust collaborative ecosystem that can truly drive innovation and economic growth in the country.

Recommendation 3: Improve infra- and infostructure in rural areas to promote more inclusive socio-economic development in Malaysia.

Instead of prioritising infra- and infostructure development in urban areas, there is an equal need to invest in enhancing existing infrastructure and building high-quality infrastructure, such as paved roads, healthcare centres, educational institutions, reliable electricity and water supply, and advanced ICT infrastructure in rural regions across Malaysia. Although substantial efforts have been made to improve the infra- and infostructure in rural areas of Malaysia, there is still considerable room for improvement. For example, more budgets and funding should be allocated for infrastructure development in rural areas, as the existing budget allocation is deemed insufficient to implement planned infrastructure projects, especially in rural areas of Sarawak (Tuah et al., 2022). In addition, it is essential to improve collaboration between the state and federal authorities to avoid confusion and ensure uniform policy implementation. Such coordination is critical to prevent delays in infrastructure development in rural areas

(Tuah et al., 2022). Also, simplifying bureaucratic procedures can further facilitate the timely execution of projects (Goh, 2022). Other than that, there is also a need for the private sector to cooperate with the government in developing rural infrastructure. To this end, the private sector can play a vital role by allowing the government to utilise logging roads for transporting materials required for rural infrastructure development (Tuah et al., 2022). Lastly, engaging local communities in planning and developing infrastructure in rural areas is also important to ensure that their needs and concerns are adequately addressed. Doing so helps create mutually beneficial outcomes where rural livelihoods are not negatively impacted while infrastructure is being developed (Tuah et al., 2022). Improving info- and infrastructure development in rural areas allows residents to access essential services and opportunities vital to their well-being. Moreover, access to such infrastructures also provides rural residents with greater opportunities to set up new businesses and lower the poverty rate in these areas, ultimately improving their overall quality of life and contributing to inclusive economic growth in the country.

Recommendation 4: Promote Science, Technology, Engineering, and Mathematics (STEM) enrolment and address skills mismatch to help bridge the skills gap in the labour market.

Educational institutions and industry players can implement several strategies to enhance the STEM enrolment rate in the country. Firstly, raising awareness about STEM careers is crucial to inspiring and attracting more students. This can be achieved via social media advertising, career fairs, STEM career awareness programs, and marketing campaigns targeted at youths. Secondly, creating a conducive and engaging learning environment for STEM subjects is also essential to nurture students' interest in STEM fields. This entails providing high-quality teaching materials and well-equipped laboratories to facilitate seamless practical lab work. In addition, cutting-edge technology and innovative teaching methods that bring "real-world"

experiences into the classroom can also help foster a conducive STEM learning environment. Thirdly, offering scholarships and STEM internship opportunities may also effectively incentivise enrolment in STEM courses. Such opportunities can provide students with ample hands-on experience in various STEM industries, thereby fostering their interests in STEM fields.

To address skill mismatches in the job market, educational institutions must work closely with industry players to ensure that the curriculum aligns with the current needs of the labour market (Muhamad, 2023; The Star, 2023c). This necessitates consistent evaluation and revision of course materials to keep pace with the latest industry trends and best practices (Meta, 2022), as well as the involvement of industry experts in teaching and mentoring students through micro-credential training programs to provide them with technical skills and practical knowledge (Muhamad, 2023). Furthermore, there is also a pressing need to promote work-based learning (e.g., apprenticeship, traineeship, internship, etc.) as an integral part of the teaching module in higher education institutions in Malaysia, as it enables students to acquire specific skills and knowledge needed by the industrial sectors. By equipping students with the necessary skills to meet the ever-changing demands of the job market, they will be better equipped to enter the workforce. This, in turn, improves their employability and can ultimately help address skills mismatch in the labour market (The Star, 2022). Lastly, employers also play an essential role in providing their employees with regular on-the-job training and upskilling opportunities. These training opportunities enable employees to stay competitive in their current roles while preparing for future career opportunities, thereby helping bridge the skills gap in the labour market (Meta, 2022).

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About Sunway IGSC

Sunway Institute for Global Strategy and Competitiveness (Sunway IGSC) is dedicated to extending its research focus beyond the traditional economic boundary of competitiveness and draws into its coverage social and environmental considerations as explicit factors of competitiveness.

Based on a more inclusive and holistic consideration, Sunway IGSC identifies three primary pillars of competitiveness: Economic, Social, and Environment. The three pillars of competitiveness provide direction and focus to the type of questions asked and the work conducted within IGSC:

- **Economic health -** This pillar investigates drivers of competitiveness from the vantage point of firms, industry, and national ecosystems, with a particular focus on policies and drivers of structure and competitive strategies to create positions of sustainable advantage.
- **Social health -** This pillar focuses on issues of distribution of wealth, equity, and unity within ecosystems as a consequence of economic policies and strategies at the firm, industry, and national levels. The lens scrutinizes who creates value, for whom, and how is this value distributed among the diverse stakeholders operating within the ecosystem. It stresses the need for inclusive creation and sharing of value creation to ensure shared prosperity.
- **Environment health -** This pillar scrutinizes how actions of individuals, firms, industry, and government impact the environment and draws into explicit consideration the need to go beyond the simple mantra of firm profit maximization and short-run economic development and competitiveness by holistic consideration of the costs to the natural environment and life of species, including that of the human race over the long run.

The mission of the Sunway IGSC is to conduct meaningful fundamental and translational research exploring global strategy and competitiveness to contribute to the strategic transformation and competitiveness of governments, industries, and society in the context of rapidly changing global dynamics.

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