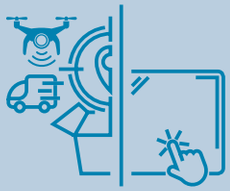

Strengthening Key Enablers towards High-Income Economy

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Introduction

During the review period of the Twelfth Malaysia Plan, 2021-2025 (Twelfth Plan) focus was given on developing future talent, boosting digitalisation and advanced technology as well as enhancing efficiency of transport and logistics infrastructure in supporting economic growth. The strategies and initiatives for talent development contributed towards realigning the labour market and developing future-ready talent. Meanwhile, various initiatives were undertaken in advancing the digital economy, mainstreaming digitalisation for inclusive development, accelerating research, development, commercialisation and innovation (R&D&C&I) as well as capitalising advanced technology potential to improve national competitiveness and resilience. In enhancing efficiency of the transport and logistics services, measures were introduced to improve people mobility, industry competitiveness, and institutional and regulatory framework. However, challenges remained and hampered the realisation of national targets and commitment to achieve sustainable economic growth.

In the remaining Twelfth Plan period, emphasis will be given to reform labour market, reshape talents for future of work, strengthen the digital economy ecosystem, and optimise the potential of R&D&C&I and escalate the advancement of technology. Meanwhile, efforts will be intensified to build resilient transport and logistics infrastructure. These efforts will further strengthen the key enablers in achieving a high-income nation, building upon the aspirations of *'Ekonomi MADANI: Memperkasa Rakyat'* and the 2030 Agenda for Sustainable Development (2030 Agenda).

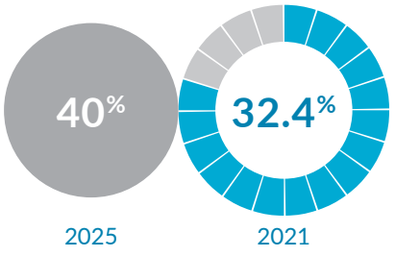
Progress, 2021-2022

In the Twelfth Plan, a total of 36 selected targets were identified in developing future talent, boosting digitalisation, and advanced technology as well as enhancing efficiency of transport and logistics infrastructure. During the review period, nine targets were achieved, 22 are on track, while five are still lagging. The performance of these targets is as shown in *Exhibit 4-1*.

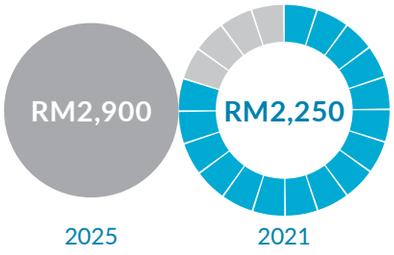
Exhibit 4-1

Performance of Selected Targets

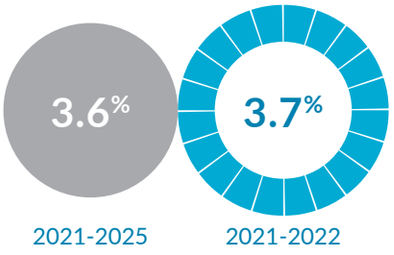
Developing Future Talent



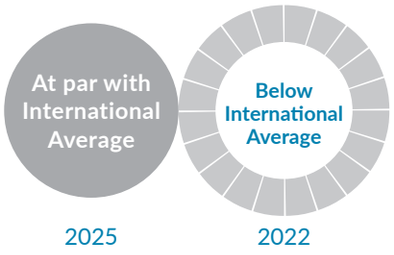
Share of Compensation of Employees to GDP



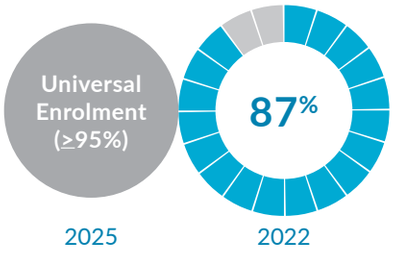
Monthly Median Salaries and Wages



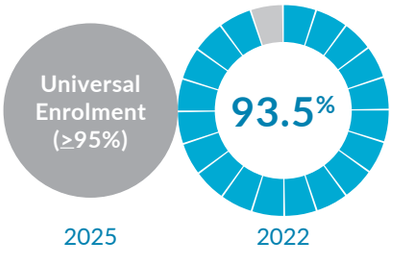
Average Growth of Labour Productivity



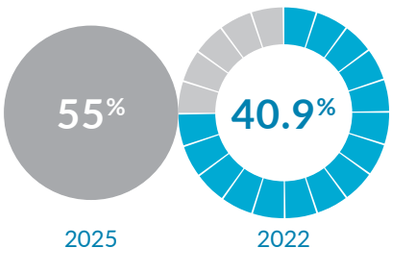
PISA and TIMSS Score



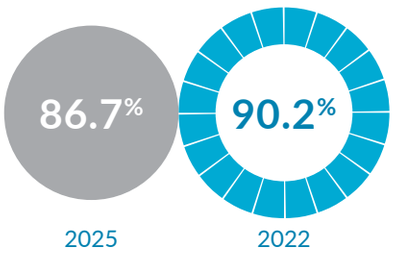
Enrolment of Preschool Students



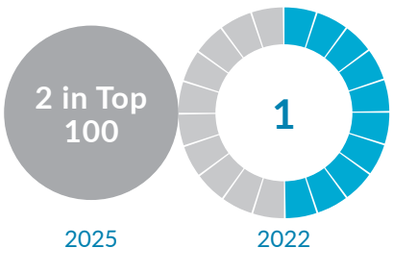
Enrolment of Secondary School Students



Intake of SPM Leavers or Equivalent into TVET Programmes

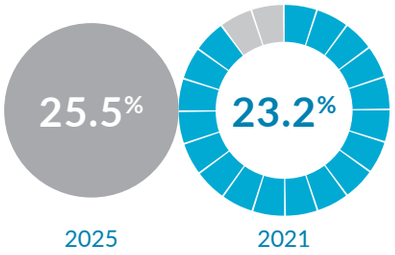


Graduate Employability from HEIs and Public TVET Institutions

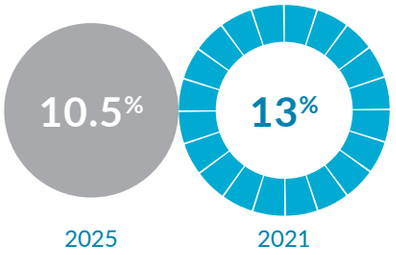


Public Universities in Top 100 of the QSWUR

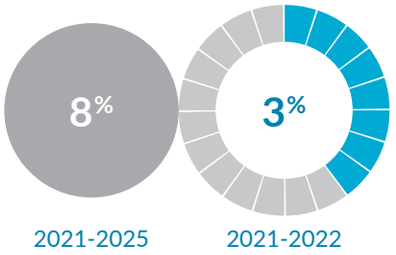
Boosting Digitalisation and Advanced Technology



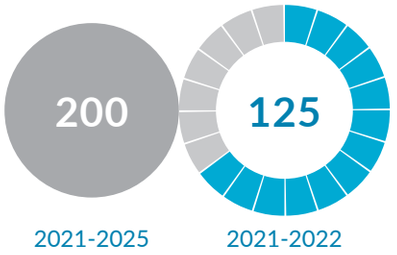
Contribution of Digital Economy to GDP



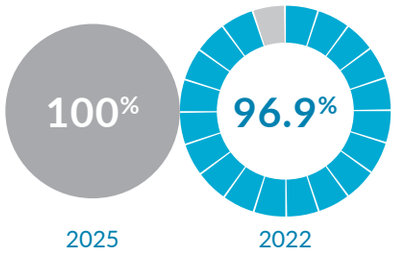
Contribution of eCommerce to GDP



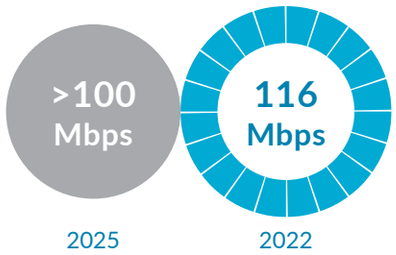
Average Growth of Digital Content Exports



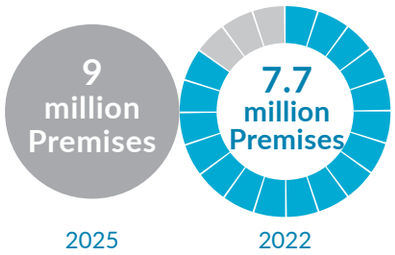
IP Creation in Digital Content



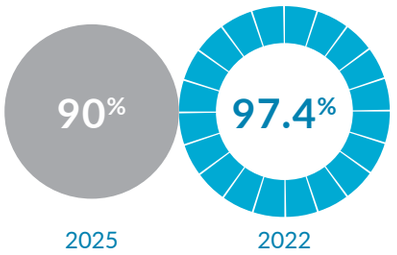
4G Coverage in Populated Areas



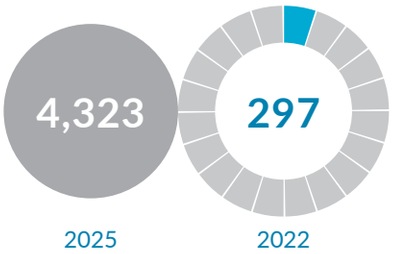
Speed of Mobile Broadband



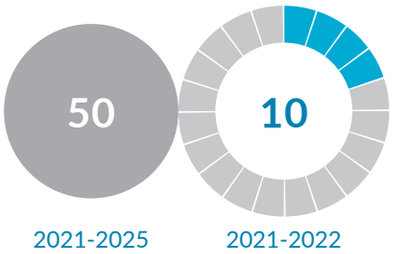
Access to Fixed Broadband Services



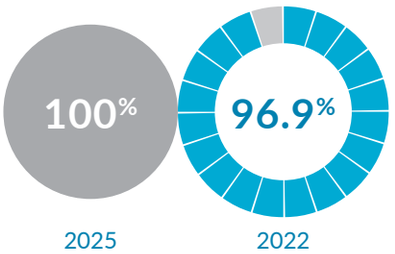
Percentage of Internet Users



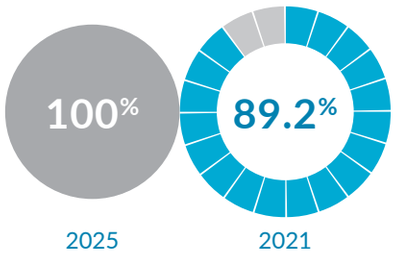
Number of Points of Presence for Broadband Connectivity in Rural Areas



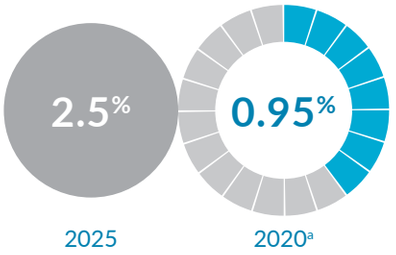
Number of Local Sharing Economy Platforms Accredited



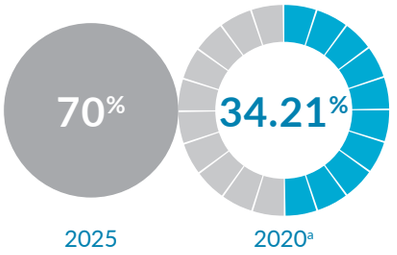
Percentage of Urban Households Subscribing to Internet



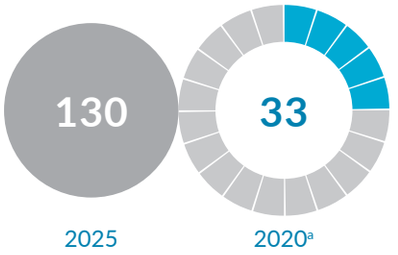
Percentage of Rural Households Subscribing to Internet



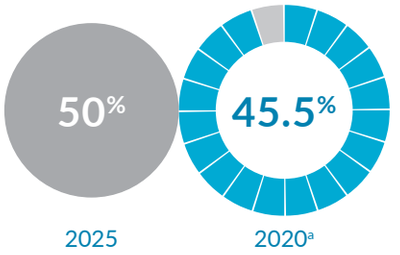
Gross Expenditure on R&D (GERD) to GDP



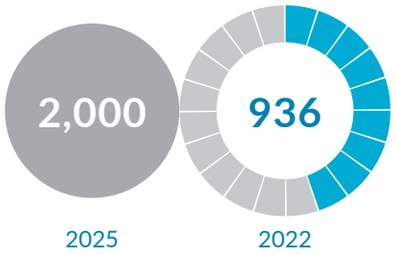
Business Expenditure on R&D (BERD) to GERD



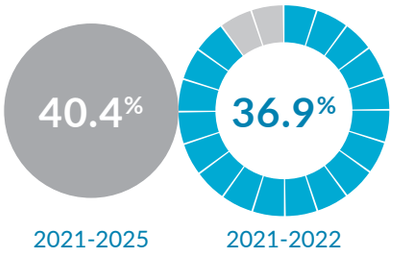
Number of Researchers per 10,000 Labour Force



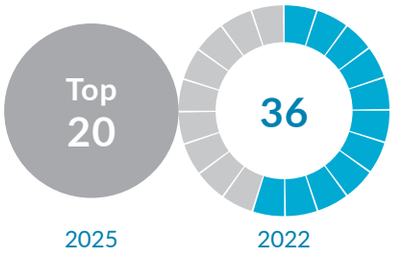
Experimental Development Research Expenditure to GERD



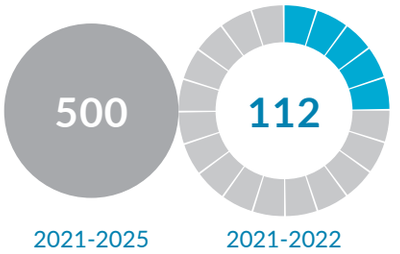
Number of Patent Applications by Malaysians



Average Multifactor Productivity Contribution to GDP



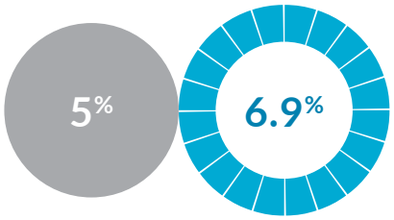
Ranking in the Global Innovation Index



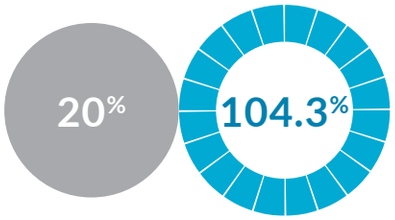
Number of Products/Solutions Commercialised through the National Technology & Innovation Sandbox (NTIS) and Malaysia Commercialisation Year (MCY)

Note: [a] According to the latest data obtained from National Survey of Research and Development (R&D) in Malaysia 2021.

Enhancing Efficiency of Transport and Logistics Infrastructure



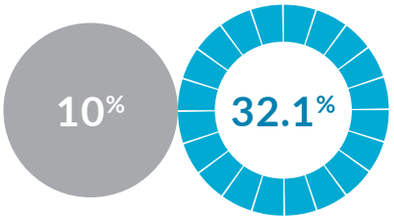
Average Growth of Public Transport Ridership in GKL/KV



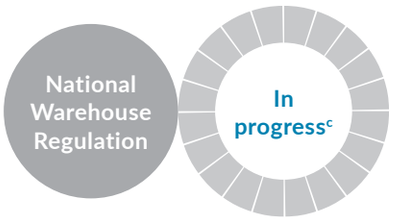
Increase in Air Transport Passengers

Ranking in the World Container Port's Report

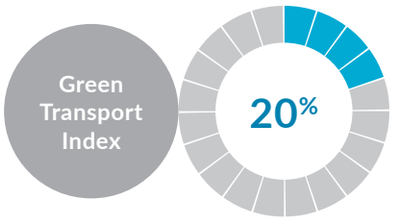
Ranking in the World Bank Logistics Performance Index



Increase in Cargo Volume via Rail in Northern, Central and Southern Regions



Standardisation of Warehouse Regulation



Formulation of Green Transport Index

Notes: [b] Based on the ranking reported in the World Bank Logistics Performance Index 2023.
[c] Discussion on standardisation of warehouse regulation among industries and agencies is still ongoing.

Achievement by Priority Area

Priority Area A: Realigning the Labour Market for Inclusive and Sustainable Growth

Strategy A1: Promoting Equitable Compensation of Employees and Labour Participation	
Strengthening Labour Market	• Amendments to the Employment Act 1955 [Act 265] completed in 2022 • The Industrial Harmony Index increased to 78.9% in 2022
Facilitating Labour Force Participation	• Composition of skilled workers increased to 29.6% in 2022 • The Housewives' Social Security Scheme implemented in 2022

Strategy A2: Strengthening the Labour Market Support System	
Promoting Responsive Workforce Training	• 2,085,950 workers trained in the Human Resource Development Corporation upskilling and reskilling programmes
Addressing Labour Displacement due to COVID-19 Pandemic	• 282,326 new jobs created and 1,021,667 individuals assisted in jobs placements under the Retention and Generation of Jobs programmes

Priority Area B: Developing Future-Ready Talent

Strategy B1: Raising the Quality of Education	
Improving Learning Outcomes	• 88 projects to reconstruct dilapidated school buildings completed • 18 new schools built
Promoting a Flexible Higher Education System	• The Guide to Entrepreneurship Integrated Education introduced in 2022
Strengthening Assessment Approach	• Alternative Assessment in Higher Education: A Practical Guide to Assessing Learning published in 2022

Strategy B2: Enhancing TVET Programmes and Governance	
Strengthening Technical and Vocational Education and Training (TVET) Programmes	• 20,190 trainees benefitted from the National Dual Training System, a collaboration between TVET institutions and industries • The Centre for Instructor and Advanced Skill Training recognised as a Centre of Excellence for TVET Instructors in 2021 • 37 TVET institutions adopted the Teaching Factory model
Improving TVET Governance	• The establishment of TVET Collaboration Hub and the Government-Industry TVET Coordination Body approved in 2022

Priority Area C: Advancing Digital Economy

Strategy C1: Providing an Enabling Environment for the Growth of the Digital Economy	
Streamlining Digital Governance	• MyDIGITAL Corporation established in 2021 • The Sharing Economy Committee established in 2022
Boosting Trade through eCommerce	• 1,126,047 micro, small and medium enterprises (MSMEs) onboarded eCommerce as at 2022
Expanding the Sharing Economy	• 13,398 digital freelance and gig workers trained in 2022
Strengthening Cyber Security	• 80 MSMEs undergone cyber security assessment under *Program Galakan Pemerkasaan Keselamatan Siber Malaysia*

Strategy C2: Strengthening Provision of Digital Infrastructure and Services	
Ensuring Equitable Access	• Communication services gazetted as a public utility in 2021 • 5G network technology launched in 2021 • 5G coverage in populated areas reached 47.1% as at end 2022

Strategy C3: Developing Future-Ready Digital Talent	
Nurturing Future-Ready Digital Talent	• 64,694 students participated in the digital making activities in 2022

Strategy C4: Positioning Malaysia as the ASEAN Digital Centre	
Digitalising Micro, Small and Medium Enterprises (MSMEs) to Broaden Market Access	• 90 new start-ups based in Malaysia Digital Hub in 2022 • 200 local MSMEs exported digital solutions in 2022 o 24 with export revenue above RM20 million

Priority Area D: Mainstreaming Digitalisation for Inclusive Development

Strategy D1: Expanding Digitalisation	
Facilitating Digital Opportunities	• 911 *Pusat Ekonomi Digital* (PEDi) includes o 874 rebranded from *Pusat Internet Komuniti* o 37 newly established
Creating More Online Business Ventures	• 21 active local sharing economy platforms validated in 2022

Priority Area E: Accelerating Research, Development, Commercialisation and Innovation

Strategy E1: Strengthening Capacity and Capability in Research, Development, Commercialisation and Innovation	
Streamlining National Science, Technology and Innovation Priority Areas	• 37% of the initiatives under the National Science, Technology and Innovation Policy Action Plan implemented • The National Nanotechnology Policy and Strategy 2021-2030 developed in 2021 • The National Biotechnology Policy 2.0 and National Nuclear Technology Policy 2021-2030 developed in 2022 • The National Vaccine Development Roadmap developed in 2021
Strengthening Funding for Research, Development, Commercialisation and Innovation (R&D&C&I)	• The inaugural Malaysia Innovates Summit, involving seven ministries organised in 2022 • The R&D&C&I category in *MyProjek* system introduced in 2022 • The MyR&D portal, a one-stop platform for R&D&C&I funding developed in 2022
Translating Research and Development as well as Intellectual Property into High Value-Added Products	• Malaysian Research Accelerator for Technology and Innovation (MRANTI) established in 2021 • *Dasar Pengkomersialan Harta Intelek dan Reka Cipta Dibiayai Kerajaan 2021-2025* introduced in 2021

Strategy E2: Nurturing Quality Talent in Science, Technology and Innovation	
Increasing Supply of Quality Talent in Science, Technology and Innovation	• 294 science, technology and innovation (STI) experts participated in the Researcher-Industry Scientific Exchange (RISE) programme • 93% of 5,000 job seekers employed by the participating companies under the Upskilling for Deeptech & Futureskills programme in 2022
Championing Effective and Fun Non-Formal Science, Technology, Engineering and Mathematics Learning	• 2.5 million participants benefitted from the implementation of STI enculturation programmes • 15 edutainment activities, supported by 21 strategic partners and 21 professional astronomers implemented under the Big Bang Astronomy programme in 2021
Increasing Effectiveness of Communication and Awareness Programmes	• e-estidotmy, a virtual platform in creating innovative and inquisitive minds on science, technology, engineering and mathematics (STEM) among students introduced in 2021

Priority Area F: Capitalising on Advanced Technology Potential

Strategy F1: Gearing up for the Fourth Industrial Revolution	

Seizing Economic Growth Opportunities Arising from the 4IR	• 25 initiatives under Phase 1 of the National Fourth Industrial Revolution (4IR) Policy implemented
	• Technology roadmaps developed in 2022
	  o The National Advanced Material Technology Roadmap 2021-2030
	  o The National Blockchain Roadmap 2021-2025
	  o The Artificial Intelligence Roadmap 2021-2025
	  o The National Robotics Roadmap 2021-2030
	  o The Electrical and Electronics (E&E) Roadmap: Technology Development 2021-2030

Creating a Conducive Ecosystem to Harness the Potential of the 4IR	• Existing sandbox ecosystem expanded to include digital internet of things (IoT), smart cities and healthtech in 2022 • One unicorn company created, while six soonicorn companies identified as at end 2022 • The Malaysia Startup Ecosystem Roadmap (SUPER) 2021-2030 launched in 2021 • 4,136 users and 2,717 start-up companies registered in the MYStartup portal

Priority Area G: Ensuring Integrated, Affordable, Reliable and Seamless People Mobility

Strategy G1: Improving Overall Accessibility of Public Transport	
Integrating Transport Modes	• PULSE application, an integrated journey planner, upgraded in 2022 o 290,020 downloads o 78,047 active users
Enhancing First- and Last-Mile Connectivity	• RAPID Mobility, an alternative community based public transportation, introduced in 2022
Encouraging Transit Oriented Development	• Kajang 2 Station complemented with mixed development completed in 2022

Strategy G2: Encouraging Behavioural Shift from Private to Public Transport	
Propelling Public Transport as the First Choice of Travel	• 1.4 million unlimited MY50 monthly travel passes sold in 2022 • Passengers of Electric Train Service (ETS) increased to 3.3 million in 2022

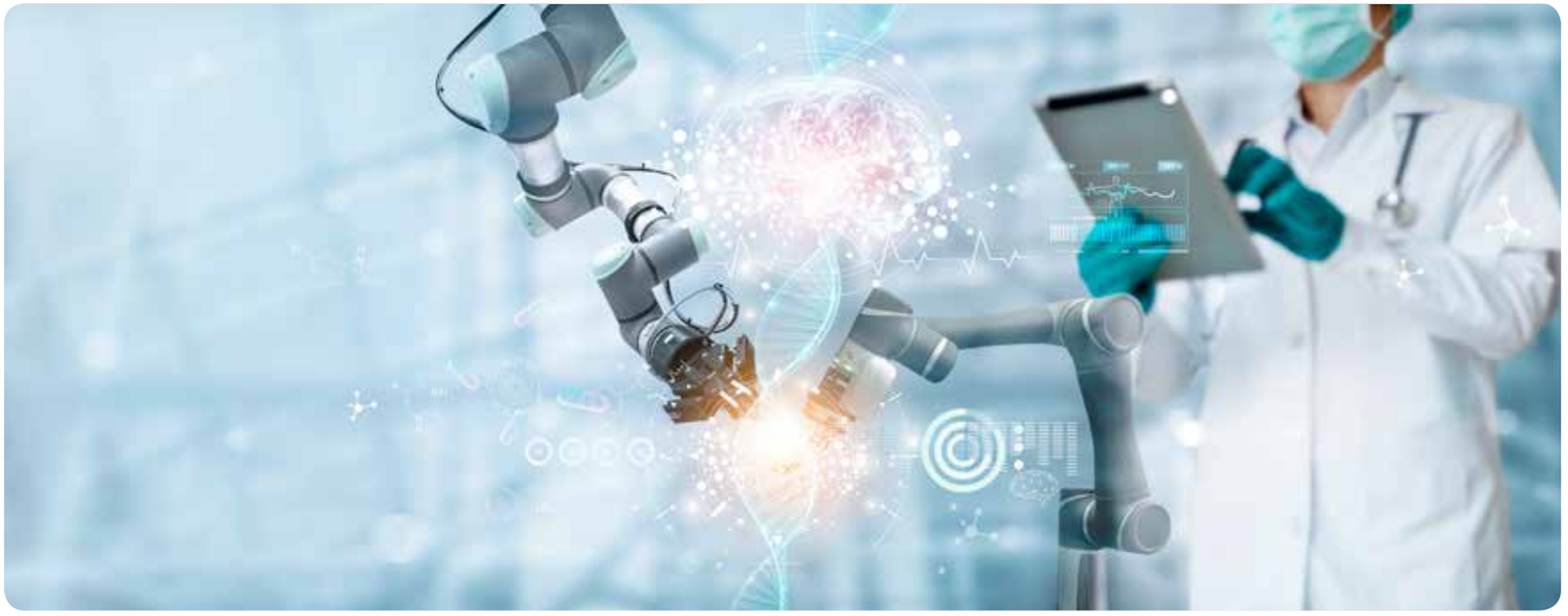
Priority Area H: Driving Transport and Logistics Industry to Enhance Competitiveness

Strategy H1: Enhancing Efficiency of Services	
Upgrading Aviation Systems and Equipment	• The Kuala Lumpur Air Traffic Control Centre and Kota Kinabalu Flight Information Region completed in 2022
Implementing Preventive Maintenance	• Six pilot projects using advanced materials and innovative technology completed in 2022

Strategy H2: Leveraging Digitalisation in Services	
Developing a Centralised Database	• *Peta Geospatial Fasiliti Logistik dan Jaringan Pengangkutan* (MyLogistik) application launched in 2021

Priority Area I: Strengthening Institutional and Regulatory Framework

Strategy I1: Improving Governance	
Strengthening Coordination among Stakeholders	• *Jawatankuasa Penilai Projek Logistik* established in 2022 • A Single Border Agency Nucleus Team established in 2021 • Sharing of prime movers and semi-trailers within a group of companies is allowed since 2021
Developing National Warehousing Regulation	• Guidebook on Starting Warehousing Business in Malaysia launched in 2021
Restructuring the Model for Highway Development	• 19 highway concession agreements reviewed
Strategy I2: Promoting Green Initiatives	
Implementing the Low Carbon Mobility Blueprint	• Exemption on motor vehicle licence fee for full electric vehicles from 2022 to 2025



Issues and Challenges

During the review period, various measures were undertaken to strengthen talent development, digitalisation and advanced technology growth, transport and logistics infrastructure. However, issues and challenges still persist and need to be addressed. These include inefficient labour market, unconducive education ecosystem, unfavourable digital economy ecosystem, challenges in accelerating R&D&C&I and advancing technology as well as gaps in supporting the growth of transport subsector and logistics industry.

Inefficient Labour Market

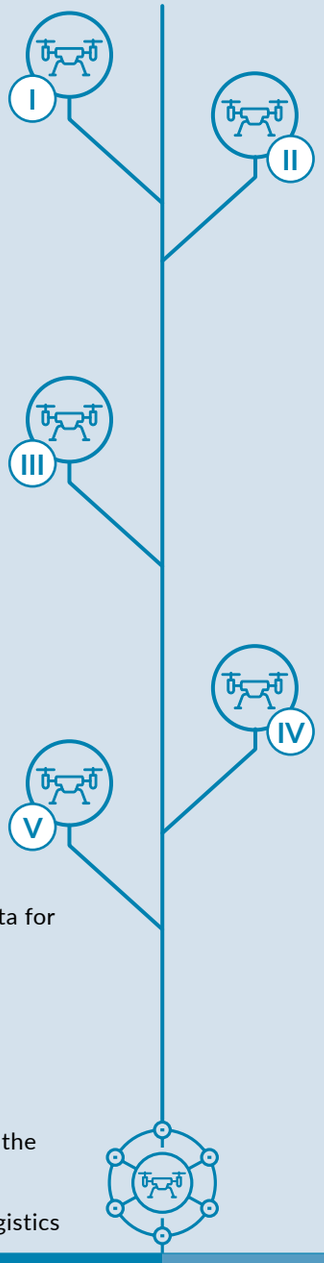
- Shortage of workers
- Low wages
- Increasing skills-related underemployment
- High dependency on foreign workers
- Lack of social protection for workers

Unfavourable Digital Economy Ecosystem

- Ineffective governance and coordination
- Uneven progress in digital infrastructure
- Lack of digital talent development
- Extended digital exclusion has widened inequality

Gaps in Supporting the Growth of Transport Subsector and Logistics Industry

- Inadequate current and real-time passenger mobility data for public transportation
- Ineffective transport governance
- Inadequate connectivity and transport infrastructure
- Insufficient maintenance of transport infrastructure
- Absence of synchronisation and standardisation among the port community systems
- Lack of awareness and understanding on sustainable logistics



Unconducive Education Ecosystem

- Insufficient technical and soft skills elements in STEM curriculum
- Lack of critical thinking, creative learning, and problem-solving skills aspects in the training and teaching methods at school
- Fragmented higher education institutions (HEIs) ecosystem in term of synergy between public and private HEIs, digitalisation plans, new programmes offerings and research focuses
- Duplication of TVET programmes and fragmented data
- Lack of industry participation

Challenges in Accelerating R&D&C&I and Advancing Technology

- Ineffective R&D&C&I resource utilisation
- Decreasing private investment in R&D&C&I activities
- Overlapping and conflicting priorities among Government Research Institutes (GRIs) and HEIs
- Low commercialisation of intellectual property (IP)
- Insufficient technology creators and developers
- Unpreparedness of industry to adopt new technology
- High costs for development and adoption of technology

Way Forward, 2023-2025

In the remaining Twelfth Plan period, focus will be given on strengthening key enablers in accelerating the momentum of economic growth. Measures will be undertaken to reform labour market, reshape talents for future of work, strengthen the digital economy ecosystem, optimise the potential of R&D&C&I and escalate the advancement of technology, as well as build resilient transport and logistics infrastructure. The implementation of these measures will boost the economy in achieving a high-income nation.

Focus Area A: Reforming Labour Market

Strategy A1:
Improving Labour Market

Focus Area C: Strengthening the Digital Economy Ecosystem

Strategy C1:
Enhancing Digital Governance

Strategy C2:
Building a Conducive Digital Infrastructure

Strategy C3:
Boosting the Growth of Digital Industries

Strategy C4:
Enhancing Future-Ready Digital Talent

Strategy C5:
Expanding Digital Inclusivity

Focus Area B: Reshaping Talents for Future of Work

Strategy B1:
Strengthening Education Initiatives and Character Building

Strategy B2:
Boosting Higher Education Excellence

Strategy B3:
Enhancing TVET Ecosystem

Focus Area D: Optimising the Potential of R&D&C&I and Escalating the Advancement of Technology

Strategy D1:
Scaling Up R&D&C&I Activities

Strategy D2:
Elevating Adoption of Advanced Technologies

Focus Area E: Building Resilient Transport and Logistics Infrastructure

Strategy E1:
Improving Passenger Mobility Data

Strategy E2:
Strengthening Transport Governance

Strategy E3:
Enhancing Connectivity and Transport Infrastructure

Strategy E4:
Improving Infrastructure Maintenance

Strategy E5:
Increasing Competitiveness of Logistics and Trade Facilitation

Selected Targets, 2021-2025

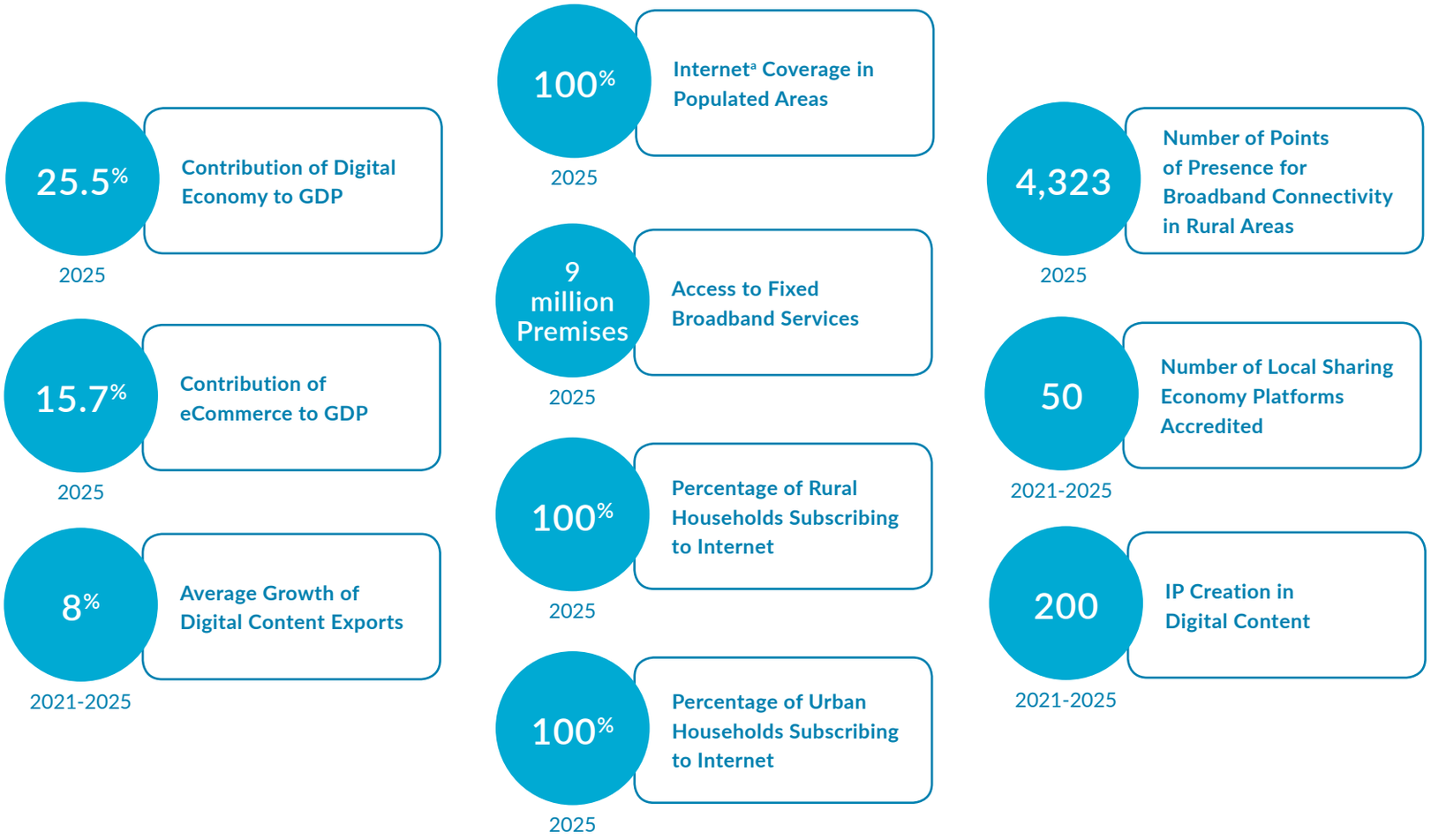
Reforming Labour Market

- 40% — Share of Compensation of Employees to GDP — 2025
- 3.7% — Average Growth of Labour Productivity — 2021-2025
- RM2,700 — Monthly Median Salaries and Wages — 2025

Reshaping Talents for Future of Work

- At par with International Average — PISA and TIMSS Score — 2025
- Universal Enrolment (≥95%) — Enrolment of Preschool Students — 2025
- Universal Enrolment (≥95%) — Enrolment of Secondary Students — 2025
- 55% — Intake of SPM Leavers or Equivalent into TVET Programmes — 2025
- 86.7% — Graduate Employability from HEIs and Public TVET Institutions — 2025
- 2 — Public Universities in Top 100 of the QSWUR — 2025

Strengthening the Digital Economy Ecosystem

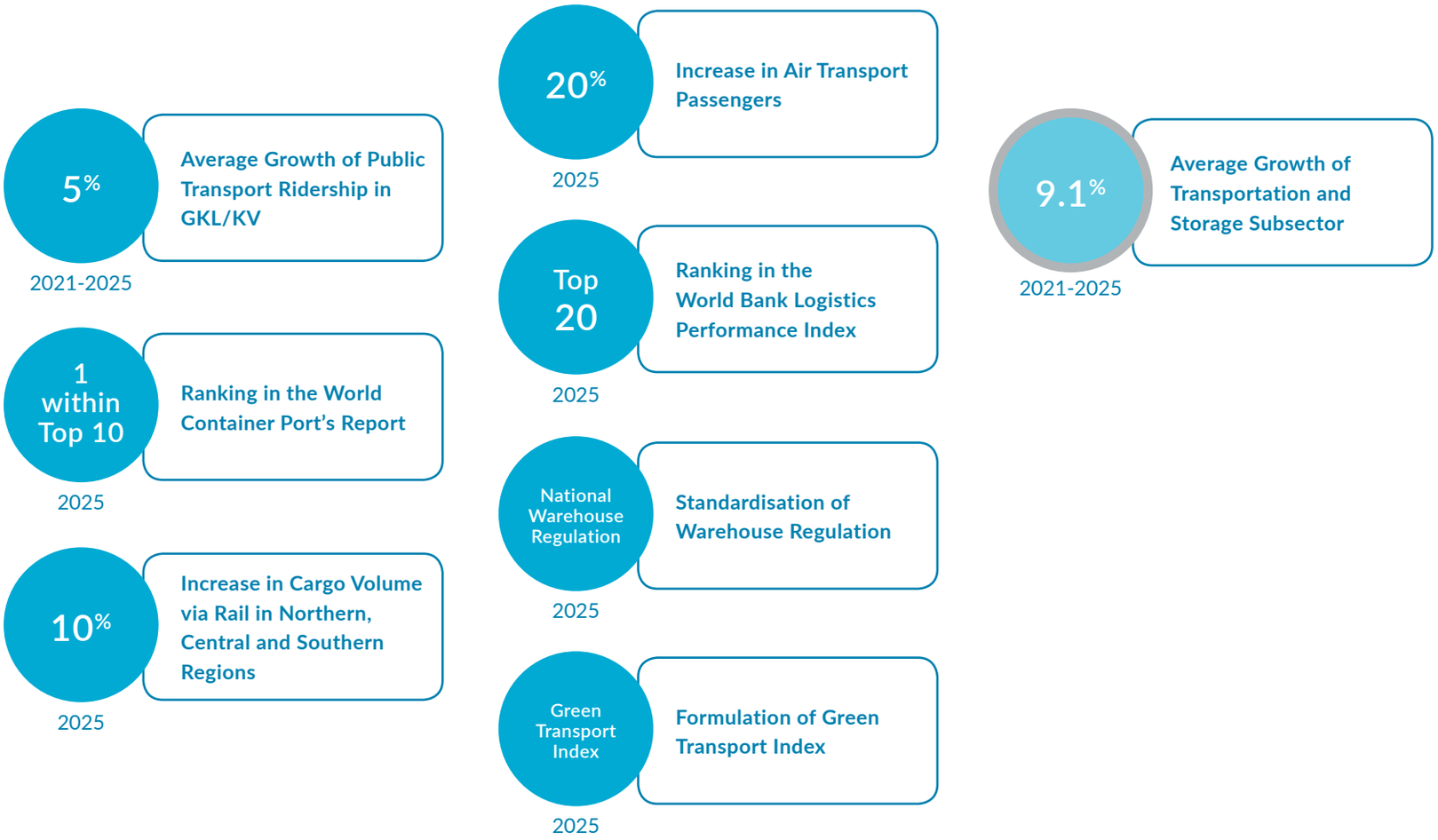


Note: [a] Internet includes WiFi and 4G.

Optimising the Potential of R&D&C&I and Escalating the Advancement of Technology

- **2.5%** — Gross Expenditure on R&D (GERD) to GDP — 2025
- **70%** — Business Expenditure on R&D (BERD) to GERD — 2025
- **50%** — Experimental Development Research Expenditure to GERD — 2025
- **130** — Number of Researchers per 10,000 Labour Force — 2025
- **2,000** — Number of Patent Applications by Malaysians — 2025
- **Top 30** — Ranking in the Global Innovation Index — 2025
- **40.4%** — Multifactor Productivity Contribution to GDP — 2025
- **500** — Number of Products/ Solutions Commercialised through the NTIS and MCY — 2021-2025

Building Resilient Transport and Logistics Infrastructure



Focus Area A: Reforming Labour Market

In the remaining Twelfth Plan period, focus will continue to be given in reforming the labour market. Thus, emphasis will be given in improving the labour market by raising wages, tackling skills mismatch, addressing labour shortages, implementing multi-tier levy and improving the welfare of workers. The implementation of all these initiatives will lead to a stronger labour market as well as competent and skilled workforce in meeting industry demand and improving the wellbeing of the workers.

Strategy A1 Improving Labour Market

Strategy A1: Improving Labour Market

Raising Wages

A progressive wage model will be introduced as part of the Big Bold Future Ready Talent as a complement the minimum wage policy. Engagements with stakeholders will be carried out in formulating a suitable mechanism to implement the progressive wage model. The National Employment Returns (NER) survey will also be revived to identify trends in wages, employment and skills including on gig workers. A better wage system will contribute towards achieving a decent living standard and reducing brain drain in the long run.

Tackling Skills Mismatch

A dynamic national skills framework will be developed to tackle skills mismatch and complement the Critical Occupations List (COL). This framework will provide comprehensive and current information on skills required by industries. The first phase is expected to be completed in 2023. The COL will also be enhanced to identify critical occupations at the regional and state levels. These measures will help to improve continuous upskilling and reskilling programmes, as part of the future talent Big Bold in meeting the requirements of the industries, which are crucial in reducing underemployment.

Addressing Labour Shortages

An initiative will be introduced to encourage employers to hire those aged 60 years and over. This will help to tackle the labour shortage and at the same time, prepare the country as an aged nation. Efforts will be undertaken to increase the female labour force participation rate by facilitating the setting up of childcare centres by employers. In this regard, existing tax incentives and guidelines on childcare centres will be streamlined.

Efforts will be undertaken to encourage employers to hire former inmates and paroled prisoners, including to participate in the Academy in Industry (Ail) programme. In addition, refugees in the country will be allowed to work in certain sectors, while waiting for relocation to third countries. Data on refugees will be consolidated to ensure smooth implementation in hiring refugees.

Implementing Multi-Tier Levy

An action plan, which includes implementing multi-tier levy mechanism and promoting automation and mechanisation will be developed to ensure the number of foreign workers does not exceed 15% of the total workforce. The implementation of the action plan will increase upskilling and reskilling opportunities for local workers and reduce the dependency on foreign workers. Meanwhile, continuous review of sectors permitted to hire foreign workers will be undertaken as a complement to the implementation of multi-tier levy mechanism. This measure is another initiative under the future talent Big Bold.

Improving the Welfare of Workers

A social protection scheme that covers injuries of employees outside working hours and not related to employment will be introduced to improve the welfare of the workers. The scheme aims to narrow the gap in providing social coverage for workers. In response to increased opportunities in the gig economy which transformed the employment landscape, guidelines of informal workers will be developed, and subsequently enable classification of gig workers as employees. This is one of the initiatives under the Big Bold Social Protection Reform. In addition, efforts in introducing a mandatory contribution for retirement savings for informal worker will be explored. These measures will enable workers to benefit from more comprehensive social protection.

Focus Area B: Reshaping Talents for Future of Work

Quality education is crucial in ensuring that talent produced meets future of work and is versatile in adapting to changes. In the remaining Twelfth Plan period, emphasis will be given in reforming the education system to elevate the quality of education and leverage emerging technologies. Among the measures to be undertaken include strengthening education initiatives and character building, boosting higher education excellence and enhancing TVET ecosystem. These measures will improve access as well as enhance the delivery of education and training, in line with the 2030 Agenda.

Strategy B1	Strengthening Education Initiatives and Character Building
Strategy B2	Boosting Higher Education Excellence
Strategy B3	Enhancing TVET Ecosystem

Strategy B1: Strengthening Education Initiatives and Character Building

Improving STEM Curriculum and Teachers Capability

Efforts will be undertaken to increase the enrolment of students in STEM. In this regard, new STEM curriculum embedded with digital technologies will be introduced to prepare students in embracing 4IR. Meanwhile, training and teaching methods for teachers in critical thinking, creative learning, and problem-solving will be further enhanced to develop skills of students for the future.

Enhancing Inculcation of Karamah Insaniah among Students

Efforts to enhance the development of human capital MADANI through the inculcation of *Karamah Insaniah* among students will be expanded. This will emphasise on the aspects of behavioural and self-development in building character among students to produce a generation that manifests resilience and competitiveness. The inculcation of *Karamah Insaniah* among students will be implemented through the teaching and learning methods (PdP) in and outside the classroom.

Strategy B2: Boosting Higher Education Excellence

Creating a Synergy among HEIs

A framework will be created to harmonise the ecosystem of higher education, by aligning programmes offered by all HEIs with national aspirations. Towards this purpose, an extensive stock taking of programmes offered will be undertaken and this information will be clustered based on national aspirations and niche areas. Under this framework, public HEIs will be anchoring at least one national priority and complemented by programmes offered in private HEIs. The framework will also outline a more robust mechanism in assessing programmes offered by private HEIs.

Digitalising Vetting Process of New Programmes

A digitalised system will be developed to enhance the effectiveness of the vetting process for new programmes offered by public universities. The system will be integrated with related databases, which include job forecasts, international programme offerings and accredited programmes. This effort is expected to address skill mismatch at the source, thus minimising the number of bridging courses.

Introducing a Comprehensive Digitalisation Plan

A comprehensive digitalisation plan for public HEIs will be developed. The plan will comprise six focus areas, namely governance, academic excellence, digital competency, digital infrastructure and infostructure, research and innovation as well as digital acculturalisation. Among the salient features of this plan is the definition of a smart campus with milestones for digitalising teaching and learning, security, transportation, accommodation and other related components.

Encouraging Social Innovation and Research on Building Just Society

The involvement of HEIs in projects that provide innovative solutions for community related problems will be promoted. In addition, HEIs will be encouraged to expand social research pertaining to respect, equality, multiculturalism, religious traditions as well as history of the nation to foster care and compassion, in line with Malaysia MADANI aspiration. These initiatives will enable HEIs to assume a more active role in empowering community and building a just society.

Strategy B3: Enhancing TVET Ecosystem

Strengthening TVET Governance

A single rating system for TVET programme will be established to ensure a standard evaluation across all TVET providers. In addition, *Sistem Pengurusan Integrasi Kemahiran Malaysia* (MySPIKE) will be expanded to integrate TVET data across ministries for better and accurate projection of TVET graduates. As a result, these measures will improve the quality of the TVET programmes and graduates.

Expanding Strategic Collaboration

The Industry Lead Body (ILB) will be empowered to expand industry driven training, which will increase recognition of TVET graduates for job placement. ILB will also drive the development of a skilled workforce in accordance with the National Occupational Skills Standards. Strategic collaborations between public TVET institutions and industries will continue to be pursued through industry placement in aligning skills to meet industry needs. Additionally, upskilling and reskilling programmes will be expanded to equip TVET instructors with skills that are in line with emerging technology as well as improve social and cross-disciplinary skills.

Focus Area C: Strengthening the Digital Economy Ecosystem

In the remaining Twelfth Plan period, efforts will be intensified to strengthen the ecosystem for the development of digital economy. The strategies include enhancing digital governance, building a conducive digital infrastructure, boosting the growth of digital industries, enhancing future-ready digital talent and expanding digital inclusivity. These measures will foster innovation and contribute to socioeconomic development towards building a digitally-inclusive nation.

Strategy C1	Enhancing Digital Governance
Strategy C2	Building a Conducive Digital Infrastructure
Strategy C3	Boosting the Growth of Digital Industries
Strategy C4	Enhancing Future-Ready Digital Talent
Strategy C5	Expanding Digital Inclusivity

Strategy C1: Enhancing Digital Governance

Streamlining Roles and Functions of Ministries and Agencies

Efforts will be undertaken to strengthen initiatives and improve monitoring mechanisms in aligning the roles and functions of ministries and agencies. In this regard, integration of data on programmes related to the digital economy from multiple ministries and agencies will be implemented. Measures will be undertaken to align digital economy programmes offered by the Federal and state governments in optimising resources.

Bolstering Regulations and Guidelines

Existing regulations and guidelines will be reviewed to meet the current global trends and to enhance the resilience of digital economy. For this purpose, a bill will be tabled in order to address cyber security issues and management. A regulatory framework for sharing economy will also be established to effectively support the evolving industry. In addition, a standard on eCommerce will be introduced to build trust and credibility of the platforms.

Strategy C2: Building a Conducive Digital Infrastructure

Enhancing Digital Infrastructure and Connectivity

Government-owned lands and buildings will be prioritised to accelerate the development of telecommunication infrastructure. Additionally, the gazettement of the Uniform Building By-Laws (UBBL) Amendment 1984 by state governments to support the policy of communication services as a public utility will be expedited. Establishment of *Jawatankuasa Penyeragaman Kos Caj dan Fi Pembangunan Infrastruktur Komunikasi* to standardise charges and fees nationwide will encourage more people to leverage internet access and reap the benefits of digital economy. Meanwhile, steps will be taken to increase Wi-Fi hotspots and access points in public areas for better internet connectivity and mobility. Audit and enforcement activities based on the Mandatory Standards for Quality of Service will be increased to improve the quality of access to wireless broadband services.

Strategy C3: Boosting the Growth of Digital Industries

Offering Better Opportunities in the Digital Economy

Priority will be given in providing incentives for existing validated platforms to attract more sharing economy businesses to apply for validation. Concomitant with the need for sustainable development, digital technology companies will be supported to develop and deploy digital solutions, which addresses environmental, social and governance (ESG) challenges. Meanwhile, the rapid development of metaverse will be incorporated into the current digital content ecosystem.

Strategy C4: Enhancing Future-Ready Digital Talent

Fostering Digital Leadership

Efforts will be undertaken to enhance awareness on the importance and advancement of digital technology among top managers and leaders. In accelerating digital adoption, leadership programmes will be introduced to

mould more digital savvy leaders from industries as one of the initiatives under the Big Bold Digital- and Technology-Based Industry. Meanwhile, leaders within education system will be further exposed to the latest digital trends and talent requirements.

Enhancing Digital Infrastructure

Laboratories and classrooms will be equipped with digital devices to provide a more conducive and attractive digital learning environment. Additionally, cloud computing will be promoted to assist educators in administration processes, for example, in accessing educational information, sharing teaching resources and undertaking academic assessment effectively. A standard operating procedure will also be established to support the 'bring your own device' approach in assisting the teaching and learning process in schools.

Improving Digital Capacity and Capability

Upskilling programmes in collaboration with industry players, as one of the initiatives under the digital and technology Big Bold, will be implemented to address the demand for high-skilled digital talent. Furthermore, a structured guideline for digital technology internship placement in the industry will be established. Digital training and assessments for educators will also be conducted regularly to ensure quality and competency in teaching digital and technology related subjects. Awareness programmes on the digital and emerging technology for counsellors in the education system will be provided to enable counsellors to advise and encourage students to pursue digital or technology-based careers.

Inculcating Interest in Technology among Students

Interest in developing digital and creative content will be inculcated for all students in school through more hands-on and engaging activities. Student empowerment through programmes designed 'by students for students' using digital platforms will be introduced. Subsequently, *Reka Bentuk dan Teknologi*, *Asas Sains Komputer* and *Sains Komputer* subjects will be offered in English to students in the dual language programme for Mathematics and Science. Digital and technology related clubs such as robotics, coding, and digital content will be added in the co-curricular list of activities to inculcate interest among students. In this regard, competitions at national and school levels will be expanded. Consistency and continuity in implementing these measures will contribute towards producing quality digital talent.

Strategy C5: Expanding Digital Inclusivity

Improving Digital Adoption

The Malaysia Digital Inclusiveness Index (MyDID) will be developed to measure digital divide and enable targeted policy prescriptions, including resource allocation and talent development. Earmarked programmes will be identified to increase digital literacy and enhance trust in achieving wider digital adoption, particularly among vulnerable groups. Concurrently, a pre-requisite digital adoption requirement for businesses will be introduced to complement existing campaigns for society to go cashless. Meanwhile, in order to uphold the safety and security of transactions and activities in digital healthcare, the end-to-end requirements for enabling digital signature will be pursued. Additionally, knowledge sharing programmes will be initiated for teachers in remote areas to emulate successful teaching practices in selected developing countries with limited infrastructure. These measures will further enhance digital inclusion[1], while improving digital adoption.

Focus Area D: Optimising the Potential of R&D&C&I and Escalating the Advancement of Technology

In the remaining Twelfth Plan period, focus will be given on optimising the potential of R&D&C&I and escalating the advancement of technology to accelerate economic growth. In this regard, two new strategies will be implemented, namely scaling up R&D&C&I activities and elevating adoption of advanced technologies. The implementation of these strategies are essential in ensuring an exponential progression to a high technology and high-income nation, which is characterised by higher productivity and increased competitiveness.

Strategy D1 Scaling Up R&D&C&I Activities

Strategy D2 Elevating Adoption of Advanced Technologies

[1] Affordable, quality, safe and secure access to digital technologies and services, including connectivity, for everyone to better lives.

Strategy D1: Scaling up R&D&C&I Activities

Reprioritising R&D&C&I Niche Areas

Selected niche areas for R&D&C&I will be streamlined based on the 10-10 MySTIE framework for government funding consideration. This will ensure optimum return on investment of all government funded R&D&C&I programmes and projects. Efforts will also be undertaken to strengthen and support R&D for the selected niche areas by establishing an alliance comprising of experts, business associations and professional bodies. Meanwhile, a cross-institutional mobility programme will be introduced to support GRIs and HEIs in scaling up the selected research activities.

Restructuring of R&D&C&I Governance

The Research Management Unit (RMU) will be restructured and empowered as an independent agency entrusted in managing allocations for public-funded R&D&C&I programmes and projects. An effective monitoring system based on a unique research identification tag will be developed to improve management of R&D&C&I programmes and projects. In addition, research funding will be streamlined based on technology readiness level and ecosystem readiness. Existing policy will be reviewed to increase investment of government-linked companies (GLCs) in local R&D&C&I activities and talent development. A cost sharing voucher programme will be introduced to enable doctorate graduates to commercialise research outputs by establishing start-ups.

Waqf for R&D will be introduced to increase the contribution of companies and individuals in R&D&C&I activities. In order to improve flexibility and performance of GRIs, efforts will be undertaken to review structure, scale and operating model. Meanwhile, a platform will be developed for leasing of research equipment, facilities and technology to optimise utilisation of resources in GRIs and HEIs.

Generating Maximum Value-Added from Intellectual Property

Technology Transfer Offices (TTOs) in GRIs and HEIs will be leveraged to strengthen capacity and capabilities in research and commercialisation. TTOs will be supported by specialised talent in technology transfer, IP management and IP valuation to accelerate commercialisation activities

and encourage collaboration among GRIs, HEIs and industries. The policy on IP will be reviewed to enhance the national IP ecosystem that will proliferate technology ownership, adoption and transfer. Meanwhile, IP assets will be leveraged in the assessment to secure funding in encouraging commercialisation and innovation activities.

The existing scope and key performance indicators of the Malaysia Commercialisation Year 2.0 (MCY 2.0) programme will be reviewed based on best practices to allow more products to qualify for nominations. In addition, collaboration among stakeholders through the Innovation Acceleration Network under the National Technology and Innovation Sandbox (NTIS) initiative will be enhanced to support marketing of local R&D technology. In relation to this, measures will also be undertaken to enhance brand intervention and market validation studies by businesses to ensure the product is well positioned in the market.

Strategy D2: Elevating Adoption of Advanced Technologies

Enhancing Innovation and Indigenous Technological Development

Focus will be given to develop sufficient and competent STI talent pool towards enhancing innovation as well as indigenous technological creation and development. For this purpose, strategic collaboration with relevant stakeholders will be strengthened to allow thorough assessment and address STI talent needs effectively. Additionally, efforts to improve the performance of selected key indicators in the Global Innovation Index (GII), such as the Programme for International Student Assessment (PISA) scales in reading, mathematics and science as well as tertiary enrolment in STEM will be given priority. In this regard, the Inter-Agency Global Innovation Index Competitiveness Monitoring Committee (JIPGII) will be established to monitor and recommend intervention measures to enhance the innovation ecosystem.

Efforts will be intensified to attract more participation into INNOVATHON, a reality TV programme that inspires the *rakyat* to capitalise their ideas through competition. INNOVATHON, as one of the initiatives under the digital and technology Big Bold, is in line with one of the core values of Malaysia MADANI which emphasises and encourages innovation. The programme, as shown in *Box 4-1*, will be implemented annually with greater collaboration from industry and strategic partners. In addition, a social innovation policy will be introduced to provide long-term strategies in implementing social innovation through latest science and technology. These measures are expected to increase talent in the science and technological sphere, who will eventually become technopreneurs.

Continuous efforts will be undertaken to create five local or homegrown unicorns by 2025. These will include providing start-ups with access to mentors, connecting with investors regionally and globally, and assisting in market expansion. In addition, the start-up ecosystem and connection to other innovation hubs around the world will be strengthened to facilitate cross-border collaboration, connectivity and market access. A start-up convention will also be held to promote technoprenuership and innovation.

Boosting the Commercialisation of Technology

Efforts will be intensified to nurture ideas into products and services by leveraging the role of technology commercialisation accelerator in bringing together key stakeholders including start-ups. In this regard, innovation hubs that provide 4IR-ready infrastructure and integrated facilities for innovators as well as entrepreneurs will be optimised to further strengthen the start-up ecosystem. These measures are expected to attract foreign and domestic direct investment in elevating advanced technology and boosting economic growth.

Enhancing 4IR Ecosystem

The newly established Centre for the Fourth Industrial Revolution Malaysia, the first in ASEAN, will serve as a platform in providing insights from policy experts and global best practices in the areas of digital transformation, GovTech and energy transition. The centre will also provide technical support for pilot projects, knowledge transfer and 4IR talent development in positioning Malaysia as a 4IR Innovation Hub. In this regard, the centre will bring together Government, business leaders, academia and experts through a global network. Meanwhile, a comprehensive review on existing initiatives outlined under the Malaysia Digital Economy Blueprint and the National 4IR Policy will be undertaken to identify gaps and strengthen implementation.

Strengthening Venture Capital Ecosystem

Efforts will be undertaken to streamline venture capital funding mechanism to develop a sustainable venture capital ecosystem as one of the initiatives under the digital and technology Big Bold, focusing on angel investors and seed funding. In this regard, a five-year venture capital roadmap will be developed to promote entrepreneurship and innovation. Additionally, this measure will further support the implementation of SUPER 2021-2030 and signify the importance of research and innovation to transform the domestic economy, and thus accelerate economic growth.

Box 4-1

INNOVATHON - A Reality TV Show on Innovation

The Ministry of Economy initiated an edutainment programme to mainstream innovation in the format of a reality TV show, known as INNOVATHON. The programme was launched on 14 April 2023 in collaboration with the Ministry of Science, Technology and Innovation together with ASTRO. This reality TV show aims to mainstream innovation, while fostering and enculturing science and technology, especially among the younger generation.

INNOVATHON provides Malaysian innovators, entrepreneurs and individuals a platform to pitch ideas, prototypes and products. The TV show is divided into three segments namely, physical and online audition, grooming and mentoring session as well as pitching and selection of winners. The physical audition was held in six cities, from 8 May to 17 May 2023, attracting a total of 1,033 innovative projects covering various areas such as agriculture, health and engineering. These projects were pitched by students from schools, higher education institutions and TVET institutions as well as academicians and entrepreneurs.

The 56 contestants selected for the seven episodes were supported in the form of exposure to Intellectual Property legislation as well as business and product development consultation during the programme. The final five winners in the grand finale were given cash prizes up to RM245,000 and grant worth up to RM1 million to support these innovation-based entrepreneurs in various stages of business development.

The first season has been beneficial in creating awareness to attract more innovators to come forward with creative ideas that could potentially be commercialised. Moving forward, INNOVATHON will be expanded into serial TV programme to scale up home-grown technologies and contribute towards innovation-led growth.

Source: Ministry of Economy

Focus Area E: Building Resilient Transport and Logistics Infrastructure

In the remaining Twelfth Plan period, concerted efforts will be undertaken to build resilient transport and logistics infrastructure. In this regard, five new strategies will be introduced, namely improving passenger mobility data, strengthening transport governance, enhancing connectivity and transport infrastructure, improving infrastructure maintenance as well as increasing the competitiveness of logistics and trade facilitation. The implementation of these strategies will address the needs of the *rakyat*, industries and global market as well as support efforts to boost economic growth.

Strategy E1	Improving Passenger Mobility Data
Strategy E2	Strengthening Transport Governance
Strategy E3	Enhancing Connectivity and Transport Infrastructure
Strategy E4	Improving Infrastructure Maintenance
Strategy E5	Increasing Competitiveness of Logistics and Trade Facilitation

Strategy E1: Improving Passenger Mobility Data

Redesigning Public Transport System with Data-Driven Approach

A study will be undertaken to identify transport modal share as well as passenger trends and behaviour to better understand travel demand and needs. Meanwhile, a collaboration between the public transport authority and telecommunication service providers will be established to leverage real-time data on spatial distribution of passengers. In addition, the usage of big data analytics will be explored to determine factors influencing passenger needs and transport demand. Strengthening mobility data to be comprehensive and real-time, as one of the initiatives under the Big Bold Strengthening Public Transport Network will support the redesigning of public transport system in meeting travel demand.

Strategy E2: Strengthening Transport Governance

Providing Conducive Ecosystem to Support the Drone Industry

An enabling environment to foster the growth of Unmanned Aircraft System (UAS) industry will be provided by improving regulations and formulating new policies. A comprehensive UAS traffic management system will also be developed to allow monitoring and enforcement on drone activities. In addition, capacity building programmes will be implemented to support the adoption of the technology.

Improving Maritime Competitiveness

A national port blueprint comprising a comprehensive port policy and implementation plan will be developed to propel the growth of the blue economy. In addition, port services will be improved to attract more collaboration among port operators and shipping alliances as well as open up new investment and trade opportunities. The expansion of Westports container terminal will increase cargo handling capacity to handle ultra large container ship and further strengthen Port Klang as a regional transhipment hub. This initiative will contribute RM55.3 billion to the economy and create more than 6,000 job opportunities in the logistics industry.

Advancing Implementation of Green Transportation

The formulation of Green Transport Index will be expedited towards the implementation of green transportation. In this regard, a green transport committee will be established to coordinate and harmonise the various rules and regulations in the transport subsector. In addition, human capital development will be strengthened to provide extensive support in governing green transport. The implementation of these measures will contribute towards achieving the aspiration of net-zero greenhouse gas emissions as early as 2050.

Efforts will be undertaken to advance green aviation by improving air traffic management, as one of the initiatives under the public transport Big Bold. In this regard, the efficiency of aircraft movements will be enhanced to minimise aircraft fuel consumption and emissions. In addition, air traffic control system and equipment will be upgraded to maximise aircraft performance and the use of airspace. These efforts will reduce fuel burn as well as noise and air pollution affecting airports and the airspace.

Strategy E3: Enhancing Connectivity and Transport Infrastructure

Strengthening First- and Last-Mile Connectivity

Efforts will be intensified to improve first- and last-mile connectivity in Greater Kuala Lumpur/Klang Valley. In this regard, the Bus Rapid Transit (BRT) and intracity bus services will be expanded to increase accessibility and connectivity from origin to final destination. This initiative is part of the public transport Big Bold. In addition, the frequency of buses will be improved, while the routes will be realigned to minimise passengers travelling time. The implementation of these efforts will enhance public transport efficiency, reduce dependency on private vehicles and subsequently, contribute towards increasing public transport ridership.

Upgrading Airport Infrastructure

Airport infrastructure will be upgraded to increase accessibility and connectivity in improving mobility of people and goods. The expansion of Penang International Airport will cater the increase of passenger movements and improve air connectivity. Meanwhile, Sultan Abdul Aziz Shah Airport, Subang will be upgraded under the Subang Airport Regeneration Plan (SARP), which will also comprise of infrastructure for aerospace and business aviation as well as terminal expansion. The SARP will contribute RM216.6 billion to the economy, as well as creating more than 8,000 high-income jobs.

Enhancing Roads Infrastructure

Roads infrastructure will be further enhanced with the construction of new alignment and upgrading of existing roads to improve connectivity and support economic development. In this regard, the construction of the new phases of Sabah Pan Borneo Highway and Sarawak-Sabah Link Road as well as the Trans Borneo Highway will connect major roads in Sabah and Sarawak. Furthermore, the Senai-Desaru Expressway and the North-South Expressway in Johor will be upgraded. These developments worth RM27 billion will enhance roads connectivity and support economic growth.

Strategy E4: Improving Infrastructure Maintenance

Strengthening Transport Maintenance

Upgrading projects involving existing road and rail infrastructure will be prioritised to manage the growing needs for maintenance works. Additionally, the monitoring mechanism on scheduled road and rail maintenance will be strengthened. Meanwhile, the use of advanced materials in maintaining roads will be further expanded to extend the life span of selected roads as well as to reduce maintenance cost. The capacity of the agencies on maintenance works for rail assets and air navigation equipment will be enhanced in the efforts to reduce reliance on contractors.

Strategy E5: Increasing Competitiveness of Logistics and Trade Facilitation

Establishing a Single Platform for Port Community

A single platform will be established to connect federal ports in providing fast and transparent access to industry players. The platform will function as a central database to facilitate end-to-end information flow and serve as a one-stop portal for maritime regulatory and port services transactions. The system will also enable the Government to carry out evidence-based planning in improving competitiveness of logistics services.

Encouraging Green Initiatives

Efforts will be undertaken to develop an internationally recognised green logistics certification system to encourage logistics service providers to adopt green supply chain best practices. The Government will also provide support for green supply chain initiatives such as green design and purchasing, reverse logistics as well as route and load optimisation. In addition, new incentives will be explored to encourage the adoption of green technology by logistics service providers.

Conclusion

During the review period of the Twelfth Plan, emphasis was given in developing future talent, boosting digitalisation and advanced technology as well as enhancing efficiency of transport and logistics infrastructure. Even though several targets were achieved, issues and challenges still remain and need to be addressed. In the remaining Twelfth Plan period, new strategies will be introduced to strengthen the key enablers in achieving a high-income nation. Efforts will be intensified on reforming labour market, reshaping talent for future of work, strengthening the digital economy ecosystem, optimising the potential of R&D&C&I and escalating the advancement of technology, as well as building resilient transport and logistics infrastructure. The new strategies aim to create efficient labour market, expedite talent development, advance digital economy, boost innovation and technology advancement as well as spur sustainable transport and logistics services, building upon the aspiration of *'Ekonomi MADANI: Memperkasa Rakyat'*.

Chapter 5