

Translating Innovation to Wealth

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For further information refer to:

Director General
Economic Planning Unit
Prime Minister's Department
Block B5 & B6
Federal Government Administrative Centre
62502 Putrajaya
MALAYSIA

<http://www.epu.gov.my>

Tel.: 603-8000 8000

Fax.: 603-8888 3755

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I. INTRODUCTION

21.1 Innovation is a key driver to create new opportunities that derive greater value for society both economically and socially. It is a process that involves deliberate application of information, imagination and initiative in translating ideas or inventions into goods or services. Innovation is a critical element of Malaysia's development agenda as it raises productivity and competitiveness to be an advanced and inclusive nation. Several measures were undertaken to strengthen the innovation ecosystem during the Tenth Malaysia Plan, 2011-2015, including investing substantially in research, development, commercialisation and innovation (R&D&C&I). Malaysia ranked 33rd out of 143 countries on the Global Innovation Index (GII), 2014. However, the outcomes and return on investment in R&D&C&I need to be further improved.

21.2 The Eleventh Malaysia Plan, 2016-2020, will address areas of weakness and push for greater innovation as well as increase the return on investment on R&D&C&I by exploring new approaches. Focus will be given to strengthening relational capital, which refers to fostering stronger linkages, collaboration and trust among stakeholders. Stronger relational capital will break down silos and reinforce collaboration between government research institutes (GRIs), institutions of higher learning (IHLs), the government and industry. Strategies will be targeted at two levels - the enterprise and society with the aim of translating innovation to wealth.

II. TENTH MALAYSIA PLAN, 2011-2015: PROGRESS

21.3 During the Tenth Plan, a series of actions to strengthen the innovation ecosystem were undertaken along four key areas:

- Shaping a supportive ecosystem by creating enabling environment for stakeholders to carry out innovation activities;
- Creating opportunities by providing incentives and investment opportunities through public procurement;
- Putting innovation enablers in place by strengthening the institutional structure and Intellectual Property (IP) regime; and
- Providing funds for research, development and commercialisation (R&D&C) initiatives.

21.4 These initiatives have resulted in the increase of innovation as reflected in the Global Competitiveness Index (GCI) where in 2014-2015, Malaysia ranked 20th out of 144 countries as compared to 24th out of 133 countries in 2009-2010. Meanwhile, the GII has ranked Malaysia at 33rd out of 143 countries in 2014 as compared to 28th out of 132 countries in 2009-2010. The GII and GCI rankings featuring selected indicators are as shown in *Exhibit 21-1*.

*Exhibit 21-1***International Ranking on Competitiveness and Innovation**

Index		Indicators	Ranking	Ranking
			2009-2010	2014
Global Competitiveness Index (GCI)	Overall		24/133	20/144
	Strength	• Government procurement of advanced hi-tech products	9	3
		• Capacity on innovation	25	13
		• Company spending on Research and Development	19	9
		• University & industry collaboration	22	12
Weakness	• Patent Corporation Treaty (PCT), patents, applications / million populations	29	32	
	• Quality of scientific research institutions	28	20	
			2009-2010	2014-2015
Global Innovation Index (GII)	Overall		28/132	33/143
	Strength	• Market sophistication	5	17
		• Business sophistication	26	29
	Weakness	• Institution	42	50
• Knowledge and technology outputs		23	39	
• Creative outputs		52	39	

Source: World Intellectual Property Organisation and World Bank

21.5 The gross expenditure on research and development (GERD) as percentage of gross domestic product (GDP) increased from 1.07% in 2010 to 1.13% in 2012. The research and development (R&D) expenditure by business enterprises (BEs) of GERD, which were mainly multinational companies (MNCs) and large domestic companies, increased from 56.7% in 2011 to 64.4% in 2012. This is still lower when compared to other nations such as 76.5% in Japan, 75.7% in People's Republic of China (PRC) and 75.4% in South Korea in 2011. The ratio of research scientists and engineers (RSEs) per 10,000 labour force has also increased from 53.1 in 2010 to 57.5 in 2012, as shown in *Exhibit 21-2*.

Exhibit 21-2
Major Indicators for R&D, 2010-2012

	2010		2011		2012	
	RM bil.	%	RM bil.	%	RM bil.	%
R&D Expenditure by Sector						
Government Research Institutes (GRIs)	0.52	6.0	1.36	14.4	0.73	6.9
Institutions of Higher Learning (IHLs)	2.46	29.0	2.72	28.9	3.04	28.7
Total GRIs and IHLs	2.98	35.0	4.08	43.3	3.77	35.6
Business Enterprises (BEs)	5.53	65.0	5.34	56.7	6.84	64.4
Total	8.51	100	9.42	100	10.61	100
GERD/GDP (%)	1.07		1.07		1.13	
Human Resource in R&D						
Total Headcount of R&D Researchers	67,412		73,752		75,257	
Total Headcount of R&D Technicians & Supporting Staff	20,902		23,209		28,729	
Total Headcount of R&D Personnel	88,314		96,961		103,986	
Total Full-Time Equivalent (FTE) of R&D Personnel	50,484		57,405		62,807	
Total FTE of Researchers	41,253		47,242		52,052	
FTE per R&D Personnel	0.57		0.59		0.60	
FTE per Researcher	0.61		0.64		0.69	
Researchers per 10,000 Labour Force	53.08		58.07		57.45	
Type of Research (Expenditure)	RM billion	%	RM billion	%	RM billion	%
Basic Research	1.52	17.9	1.62	17.2	3.66	34.5
Applied Research	5.80	68.2	6.26	66.4	5.36	50.5
Experimental Research	1.19	13.9	1.54	16.4	1.59	15.0
Total	8.51	100	9.42	100	10.61	100

Source: Malaysia Science and Technology Information Centre (MASTIC)

21.6 As part of the agenda to promote innovation activities across all sectors of the economy, several measures were undertaken by the Government which included:

- Establishing specialised agencies to drive the innovation programmes such as the *Agensi Inovasi Malaysia* (AIM), National Science and Research Council (NSRC) and *Yayasan Inovasi Malaysia* (YIM);
- Implementing higher order thinking skills (HOTS) programmes in schools and tertiary institutions to inculcate creative thinking culture;
- Catalysing commercialisation via *Khazanah Harta Intelek Malaysia*, a centralised repository on IPs arising from Government research programmes;
- Setting up PlaTCOM Ventures Sdn. Bhd. (PlaTCOM) and Steinbeis Malaysia Foundation (Steinbeis) to enhance collaboration and provide advisory services to both researchers and companies, that is connecting knowledge creators and those who need the knowledge; and

- Implementing online programmes such as UReka and GIGIH to provide open innovation platforms where people were given the opportunity to share ideas, seek expertise, form collaborative teams and attract funders and customers as well as generate additional income through proven innovative and sustainable business models.

21.7 Private entities and non-governmental organisations (NGOs) were also involved in programmes to support innovation such as:

- The Young Enterprise Programme, by the American-Malaysian Chamber of Commerce (AMCHAM), involved selected secondary school students forming a 'mini company' which exposed them to the complete business cycle, beginning from capitalisation to voluntary liquidation. From 2011 to 2014, about 3,600 students benefitted from this programme; and
- Entrepreneurship programmes by the Enactus Malaysia Foundation, an international non-profit organisation, brought together students, academics and business leaders to use the power of entrepreneurial action to improve the quality of life and standard of living for people in need was implemented. The experiences gained helped participants develop their leadership and entrepreneurship skills. In 2012, 36 teams comprising 2,047 participants were involved in various community projects benefitting 99,515 people.

III. ISSUES AND CHALLENGES

21.8 There are several areas of weakness in innovation ecosystem that need to be addressed. These include lack of coordination in the implementation of science and technology policies, lack of industry and society linkages to universities and GRIs as well as insufficient transfer of technology and technical spillover from foreign to domestic firms.

21.9 As measured by the Conference Board of the World Bank, Malaysia was in the efficiency stage for 19 years before it graduated to the current transition stage. Malaysia needs to move to the innovation-driven stage to become an advanced nation. The issues and challenges hampering innovation are as follows:

- Lack of coordination in R&D&C&I initiatives
- Low commercialisation of R&D output
- Ineffective utilisation of resources
- Low innovation in companies
- Lack of critical thinking skills

Lack of Coordination in Research, Development, Commercialisation and Innovation Initiatives

21.10 The Public Research Asset (PRA) Evaluation Performance Study, 2013, by NSRC highlighted lack of coordination in R&D&C&I initiatives. Currently, there are 44 agencies under ten ministries engaged in these initiatives. This has resulted in competition for resources as well as overlapping and conflicting priorities in some research areas. As a result, GRIs and IHLs are unable to build and maintain their core R&D capabilities in areas of strategic importance.

21.11 The PRA study also highlighted the lack of an effective monitoring and evaluation mechanism to track the progress of these initiatives as well as their impact on completion. In line with efforts to strengthen the feedback mechanism, a multi-agency taskforce known as *Jawatankuasa Pelaburan Dana Awam* (JKPDA) was established in 2013 to act as a technical evaluation committee for R&D&C&I project funding. In 2014, out of 126 R&D&C&I project proposals submitted, 34 were rejected either due to duplication, were not in line with the national priority areas, or should be implemented in collaboration with other agencies.

21.12 With respect to social innovation¹, uncoordinated efforts and lack of a structured framework are key constraints, where most programmes are conducted in silo. There are 1,200 social NGOs and 70 social enterprises (SEs), in addition to government agencies that are delivering social interventions independently. Many of these NGOs and SEs have limited funding to undertake their programmes. Many corporations also undertake social services as part of corporate social responsibility for branding and advertising purposes. While the number of programmes are large, their impact is small.

21.13 Social innovation programmes by YIM, Women in Innovation (WIN) and AIM are conducted in silo. Due to weak linkages and collaboration, the dissemination of information about these programmes is limited and uncoordinated resulting in a large portion of target groups, especially in rural areas, unaware of the programmes.

¹ Social innovation is often presented as a way to increase the quality of social services and their cost-effectiveness by offering equivalent outcomes despite considerable budget constraints or using the same amount of budget. The innovation can take place within/from government, third sector or in spaces between them.

Low Commercialisation of Research and Development Output

21.14 GERD increased from RM8.5 billion in 2010 to RM10.6 billion in 2012. Despite continuous increase in funding, the return on investment is still low. Commercialisation of research output by IHLs and GRIs are low as most R&D projects are supply-driven and the IPs generated not demanded by industry. The National Survey of Research and Development 2013, by Malaysia Science and Technology Information Centre (MASTIC) revealed that 7,899 IPs were filed in 2012 but the revenue generated was only RM1.6 million as compared to 464 IPs by BEs that generated RM15.4 million, as shown in *Exhibit 21-3*. Generally, researchers conducting public funded R&D projects focus on publishing scientific journals and the creation of IPs, while efforts to commercialise is minimal.

Exhibit 21-3

Types of Research and IP Generation

Types of Research	2010 (%)	2012 (%)
GRIs and IHLs		
• Basic	43.6	34.9
• Experimental	11.63	11.2
• Applied	44.8	53.9
BEs		
• Basic	4.1	34.2
• Experimental	15.1	17.2
• Applied	80.0	48.6
Intellectual Properties	2012	
GRIs and IHLs		
• number of IPs produced	7,899	
• commercialisation value (RM million)	1.62	
BEs		
• number of IPs produced	464	
• commercialisation value (RM million)	15.41	

Source: Malaysia Science and Technology Information Centre (MASTIC)

Ineffective Utilisation of Resources

21.15 GRIs and IHLs spend about RM3 billion annually on R&D projects, including the acquisition of facilities and equipment. However, the utilisation rate of these equipment is categorised as moderate and low among IHLs, and research institutions, as shown in *Exhibit 21-4*. In addition, there is also a lack of collaboration between government agencies and companies, particularly small and medium enterprises (SMEs). This collaboration is crucial as SMEs generally cannot afford R&D activities due to the high cost of equipment.

Exhibit 21-4

Utilisation Rate of Science and Technology Equipment, 2012/2013

Source of funding	Item	Total Number of Equipment	%	Total Cost of Equipment (RM million)	%
Public		1,479	76.8	1,215.99	70.8
Private		418	21.7	482.18	28.1
Joint Public-Private		13	0.7	8.89	0.5
International		15	0.8	9.73	0.6
Total		1,925	100	1,716.78	100

Level of usage of Equipment According to Respondents			
Respondents	High Usage (%)	Moderate Usage (%)	Low Usage (%)
Institutions of Higher Learning	39.6	41.6	18.8
Government Agencies	57.2	22.5	20.3
Research Institutions	35.7	28.1	36.2
Government-linked and Private Firms	27.4	65.6	7.0
Hospitals	46.3	50.3	3.4

Source: Malaysia Science and Technology Information Centre (MASTIC)

Low Innovation in Companies

21.16 Expenditure by companies on R&D is still low despite high awareness on the importance of innovation. The study on Technological Innovation Capabilities of Malaysian-Owned Companies (MyTIC), 2012, by Malaysia Productivity Corporation (MPC) indicated that 77% of SMEs spend RM100,000 or less a year on R&D. Only 27% of large companies and 10% of medium-sized companies spend RM1 million or more a year. The top 30 local conglomerates by market capitalisation spend an average 0.3% of their annual revenue on R&D. Meanwhile, the OECD Reviews of Innovation Policy in Southeast Asia, 2013, also reported that, on average only 5.5% of companies in Malaysia actively participate in R&D activities involving mostly the MNCs.

21.17 The low expenditure on R&D has hampered the capability and capacity of companies, particularly SMEs, to innovate. In addition, companies perceive innovation activities as high cost and high risk with uncertain demand, as shown in *Exhibit 21-5*. This lack of innovative capability of SMEs has also hindered collaborations with MNCs and large companies and transfer of technology and technical spillovers. MNCs in Malaysia sourced less than 40% of their inputs from domestic companies. The MyTIC indicated that most companies are adopters and adapters rather than creators of technology with 52% of companies in adapter category, 36% adopter and only 6% creators.

Exhibit 21-5

Factors Hampering Innovation Activities

Relative Factors Hampering Innovation Activities		Manufacturing Sector	Services Sector
		(Scale 0-3) 0 – Not Relevant; 3 – Highly Relevant	
Cost Factors	Cost too high	2.16	1.74
	Lack of funds within the organization	1.93	1.71
	Excessive perceived risk	1.65	1.51
Market Factors	Uncertain demand for innovative goods and services	1.81	1.30
Organisational Factors	Attitude of personnel towards change	1.66	1.54
	Attitude of managers towards change	1.59	1.32

Source: Malaysia Science and Technology Information Centre (MASTIC)

Lack of Critical Thinking Skills

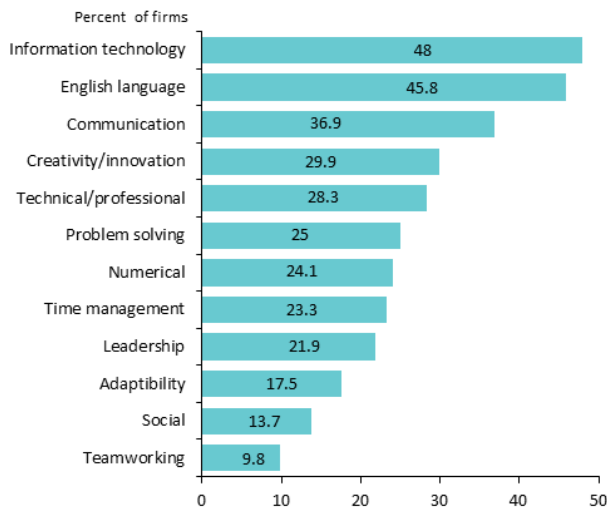
21.18 Substantial investments have been made in education but the quality of graduates does not match industry needs as indicated by several international reports. The current ratio of students in Science, Technology, Engineering and Mathematics (STEM) and non-STEM education is 42:58 compared with the target of 60:40. In 2012, Malaysia was ranked 52nd out of 65 participating countries in the Programme for International Student Assessment (PISA), with mean scores below the global average. STEM ratio and PISA findings indicate that significant efforts are required to achieve the targeted number of RSEs of 70 per 10,000 labour force by 2020 compared with the current ratio of 57.5 per 10,000 labour force.

21.19 There is a lack of soft skills among students such as critical thinking, communications, innovation, teamwork and leadership. This has partly contributed to the mismatch between the requirements of the labour market and the skills of job seekers, as shown in *Exhibit 21-6*. With the transition towards an economy that is driven by high value and knowledge intensive activities, the jobs created will require higher order thinking skills, as shown in *Exhibit 21-7*.

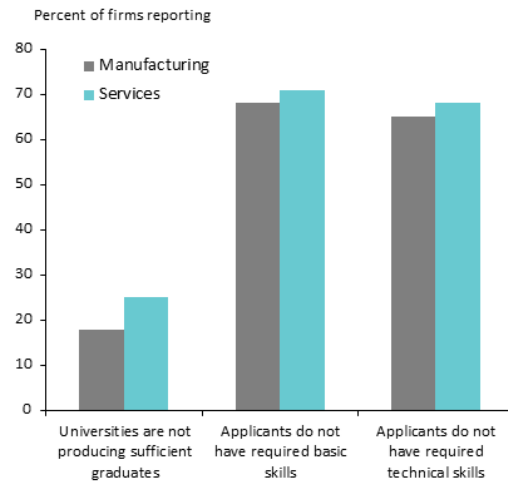
Exhibit 21-6

Malaysian Firms' Skills Requirement Constraint and Lack of Skills Leads to Job Vacancies, 2009

Firms generally identify non-routine and other soft skills as a key constraint



Applicants' lack of skills leads to job vacancies

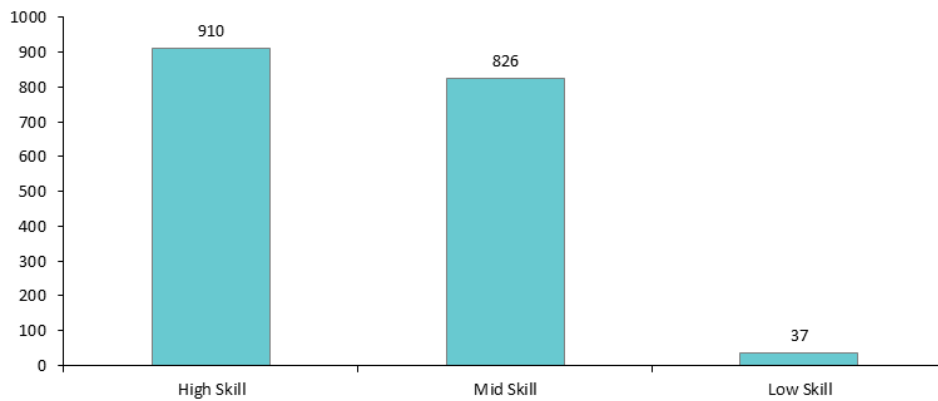


Source: World Bank: Malaysia Economic Monitor, 2012

Exhibit 21-7

Jobs Creation in Malaysia, 2001-2010

Most jobs created between 2001 and 2010 by skill level ('000)



Source: World Bank: Malaysia Economic Monitor, 2012

IV. ELEVENTH MALAYSIA PLAN, 2016-2020: WAY FORWARD

21.20 The Eleventh Plan will focus on translating innovation to wealth through strengthening relational capital to foster stronger linkages, collaboration and trust among stakeholders. Stronger relational capital will improve coordination and enable the sharing and testing of ideas across multiple stakeholders and disciplines, thus improving the national innovation ecosystem to enable Malaysia to bring creative outputs to market and share resources. Strategies will be undertaken at both the enterprise and societal levels to sustain economic growth and improve wellbeing.

Enterprise Innovation

Targets

21.21 The targets set for enterprise innovation are as shown in *Exhibit 21-8*.

Exhibit 21-8

Achievements and Targets for Enterprise Innovation

Indicator	2010	2012	2020
Ratio of business and Government expenditure on R&D	65:35	64:36	70:30
GERD/GDP (%)	1.07	1.13	2.0
Ratio of researchers/10,000 labour force	53.1	57.5	70.0
Commercialisation rate of R&D outputs by:			
• IHLs (%)	3.4	2.1 ¹	5.0
• MOSTI R&D Fund (%)	5.5	3.1 ¹	10.0

Note: ¹ data as of 2013

Source: Malaysia Science and Technology Information Centre (MASTIC) and Ministry of Education

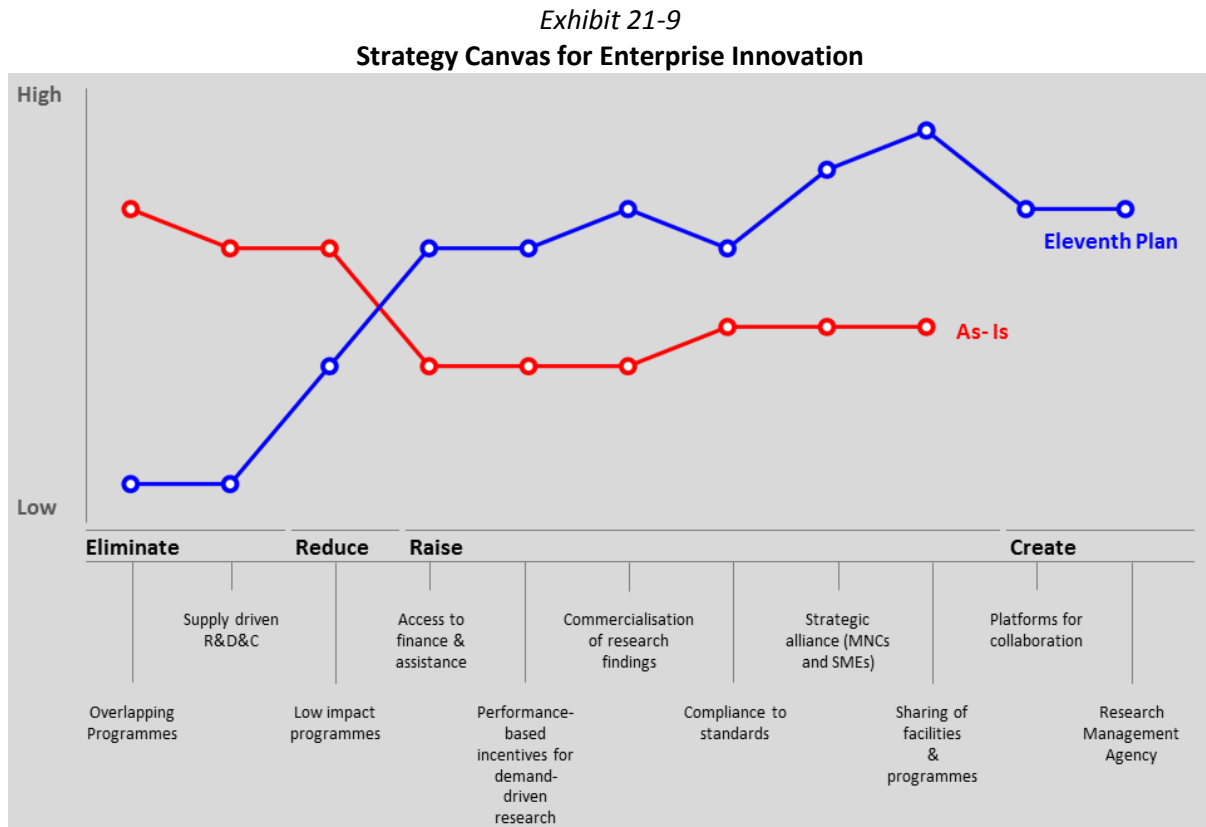
Strategies

21.22 Efforts to enhance innovation at the enterprise level are based on four strategies, namely:

- **Strengthening the governance mechanism** by creating a research management agency (RMA) and expanding the 1Dana Portal;
- **Enhancing demand-driven research** by streamlining public sector funding for R&D&C&I;
- **Strengthening industry-academia collaboration through intermediaries** by encouraging local and international collaborations for technology transfer, including strategic alliances between MNCs and SMEs; and

- **Promoting private financing of research, development, commercialisation and innovation** by increasing access to private sources of financing, and developing a framework for risk mitigation and management of crowdfunding activities.

Initiatives to support these strategies are as shown in *Exhibit 21-9*.



Strengthening the Governance Mechanism

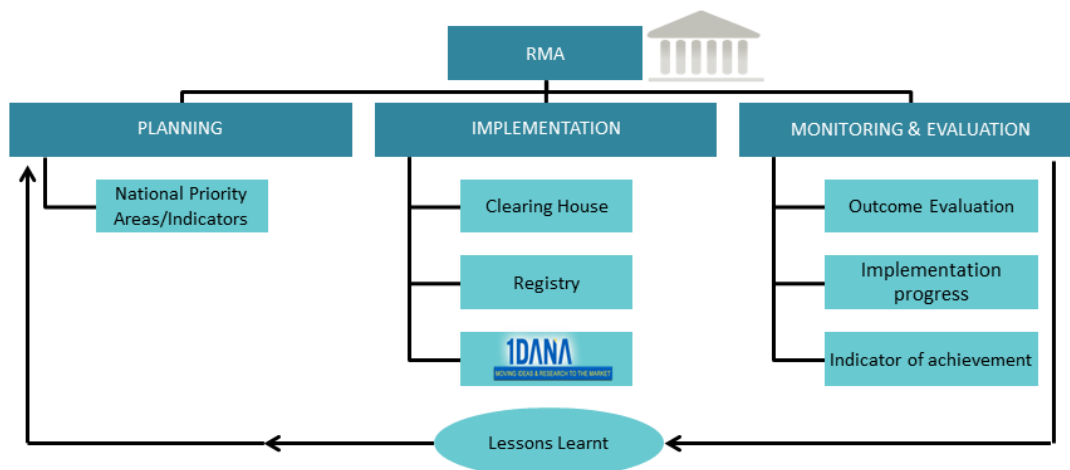
Establishment of Research Management Agency

21.23 An existing agency will be restructured to become the RMA to strengthen the institutional mechanism to manage public R&D&C&I initiatives to improve effectiveness, maximise outcome and increase return on investment. In addition, the agency will also review existing programmes to eliminate those which are overlapping and supply-driven and reduce low-impact programmes.

21.24 The structure of the RMA is as shown in *Exhibit 21-10* and the role of the RMA is as follows:

- Conduct studies on technology foresight and market trends in setting the national priority areas for R&D;
- Act as a clearing house to ensure project proposals are in line with the national priority areas;
- Foster interdisciplinary and multi-agency research efforts, enable researcher mobility as well as allow the development of competitive and collaborative R&D;
- Maintain the 1Dana portal as a centralised one-stop online repository for R&D&C&I projects containing information on output, facilities and equipment, experts and field of expertise; and
- Monitor and evaluate the progress and impact of R&D&C&I projects and the information to be used as feedback for continuous improvement.

Exhibit 21-10
Structure of Research Management Agency



National Priority Areas

- Fundamental research: knowledge
- Priority research: national problems
- Strategic Research: new industry
- Demand-driven research: company solutions

Clearing House

- Coordinate all public funded R&D&C&I projects, to ensure effective and efficient utilisation of public funds

Registry

- Facilities
- Outputs / Findings
- Experts/ Expertise
- Projects

1DANA

- centralised one-stop online repository for lists of R&D&C&I projects and their outputs, facilities & equipment; and expert & their field of expertise

Monitoring and Evaluation

- Targets
- Evaluate outcomes of R&D&C&I initiatives
- Monitor progress of implementation
- Assess indicators of achievement

Source: Economic Planning Unit

Sharing of resources

21.25 The 1Dana portal, established in 2014, will be expanded to serve as a centralised registry for R&D&C&I-related information to encourage sharing of resources and programmes. This will include information on R&D facilities and equipment, expertise in various fields, research output and IPs. Through this portal, owners of R&D capital will be able to maximise the use of their facilities and equipment, and also, increase their income through the pay-per-use approach. In addition, companies will have access to these resources without incurring large capital outlays and will be able to upgrade, test and certify their products to meet international standards. Information from other related portals such as krste.my, TECHMart database and myren.net.my, will be integrated with the 1Dana portal for better outreach.

Promoting innovative corporate culture

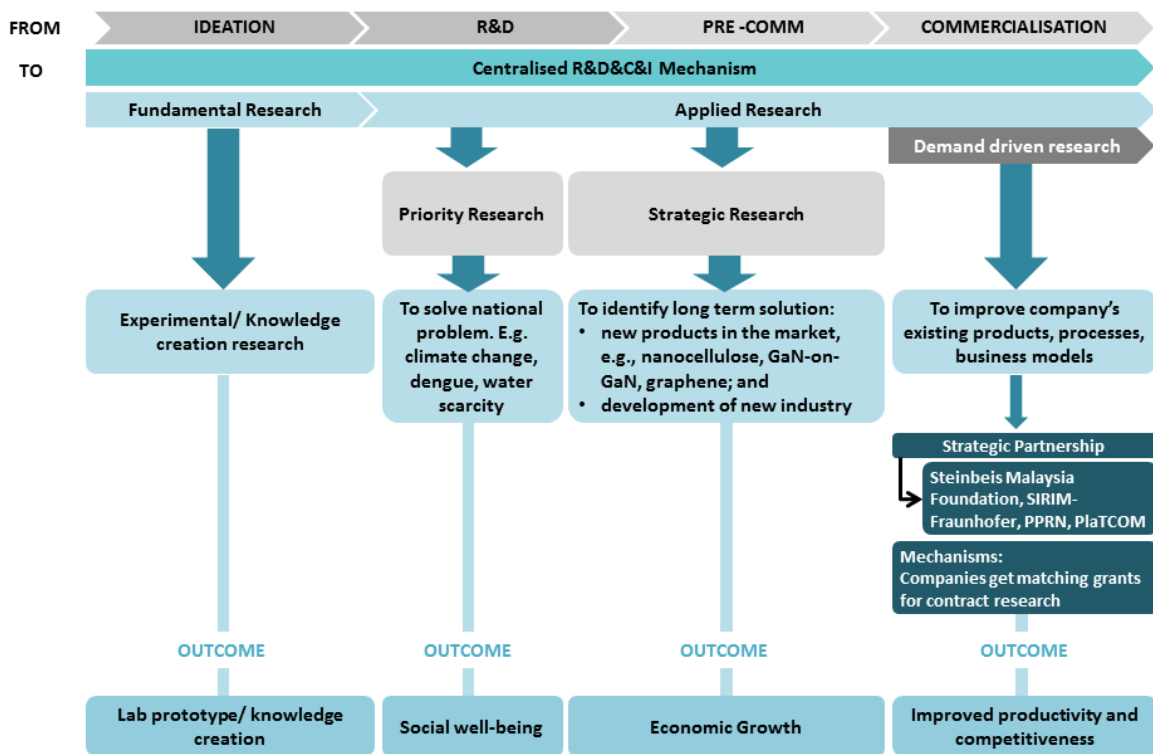
21.26 Innovation also needs to be embedded into the corporate culture to enable companies to gain competitive advantage and be sustainable. Support will be given to mid-level and large companies to enable them to move to the next level and capture return on innovation via programmes such as the National Corporate Innovation Index (NCII), Mid-Tier Companies Development Programme (MTCDP) and the Intellectual Capital Future Check (ICFC). The adoption of NCII will enable companies to measure innovation and translate it into financial returns, while the MTCDP helps local mid-tier companies in Malaysia to strengthen their core business functions and to accelerate their export growth. Through the ICFC, companies will be able to deliver structured reports on intangible assets such as tacit knowledge, IPs and networking to financial institutions leading to increase their credit worthiness.

Enhancing Demand-driven Research

21.27 Public sector funding for R&D&C&I projects will be streamlined to ensure better returns. Funding will be targeted at national priority areas which have been identified to drive economic growth. The centralised mechanism managed by RMA will coordinate research to reduce duplication, increase synergy and channel funding into fundamental, applied and demand-driven research, as shown in *Exhibit 21-11*. In this regards, emphasis will be given to applied research and demand-driven research to promote strategic partnerships between companies and researchers, and generate higher return on investment, as follows:

- Applied research
 - *Priority research* is to solve national issues such as climate change, communicable diseases and water scarcity. This is expected to improve social well-being; and
 - *Strategic research* is for a longer term solution to identify new products and services for the market as well as to develop new industries. The outcome is expected to generate economic growth.
- Demand-driven research will be implemented through strategic partnership basis between companies and researchers to solve specific problems within stipulated time at lower cost. Intermediaries will facilitate companies to connect to the right expertise. This is expected to improve productivity and competitiveness of the companies and higher commercialisation rate of R&D

Exhibit 21-11
Centralised R&D&C&I Mechanism



Source: Economic Planning Unit

Strengthening Industry - Academia Collaboration through Intermediaries

21.28 Creation of new products or processes require continuous R&D and innovation. The Government has established new intermediaries namely Steinbeis, SIRIM- Fraunhofer and PlaTCOM to encourage companies to innovate and improve their market competitiveness and productivity. The details of the newly established intermediaries are as shown in *Box 21-1*. These intermediaries will complement existing agencies such as Malaysian Technology Development Corporation (MTDC), Collaborative Research in Engineering Science and Technology (CREST) Centre, and Aerospace Malaysia Innovation Centre. These industry-led intermediaries will continue to facilitate companies to source for the right researchers to provide solutions in terms of technology, process and business model improvements. This strategic alliance will accelerate sharing of knowledge and innovative ideas and improve company competitiveness.

21.29 The Public Private Research Network (PPRN), in the Ministry of Education (MoE), will connect industries to researchers in universities to conduct contract research. In addition, the Health Technopolis initiative to attract a cluster of healthcare firms and research-intensive companies to locate within Universiti *Kebangsaan Malaysia's* (UKM) campus to foster demand-driven research will be led by UKM. Guidelines will be formulated for researchers in areas such as remuneration, use of universities' facilities and equipment and IP ownership. The intermediaries' scope of work is as shown in *Exhibit 21-12*.

Exhibit 21-12
Matrix Analysis of Intermediaries

Intermediaries	Target groups	Focus areas	Services rendered	Source of Funding	Funding Support
SIRIM-Fraunhofer	SMEs in manufacturing sector	<ul style="list-style-type: none"> Renewable energy Energy storage Medical devices Automation Industrial design Machinery & equipment 	<ul style="list-style-type: none"> Demand-driven Research Product and process improvement Up-scaling and pilot production Training Technology audits Testing, inspection, certification and calibration Applied Research (Priority/ Strategic Research) 	<ul style="list-style-type: none"> Government Industry Regional International 	<ul style="list-style-type: none"> Matching grants (Government: 50-80%; Industry: 20-50%) Soft loans
Steinbeis	All companies /business entities	<ul style="list-style-type: none"> Healthcare Nanotechnology E&E Palm Oil/Rubber Telecommunications 	<ul style="list-style-type: none"> Demand-driven Research Provide subject matter experts (local & foreign) for business solution Steinbeis Network for market reach Train companies to attain international standards 	<ul style="list-style-type: none"> Government Self generating income 	<ul style="list-style-type: none"> Cost of services borne by clients. (RM30,000-RM50,000) Revenue generated will fund Steinbeis
PPRN	<ul style="list-style-type: none"> Local Universities SMEs 	All economic sectors	<ul style="list-style-type: none"> Demand-driven Research Part -Financing projects Connect firms to researchers Contribute facilities to applied research 	<ul style="list-style-type: none"> Government Industries 	<ul style="list-style-type: none"> Matching grants (Government: RM30,000 maximum)
PlaTCOM	<ul style="list-style-type: none"> SMEs, IHLs/ GRIs, individual inventors 	All economic sectors	<ul style="list-style-type: none"> Demand-driven Research End-to-end facilitation from concept to commercialisation, IP protection, capacity building & advisory services 	<ul style="list-style-type: none"> Government Industries 	<ul style="list-style-type: none"> Matching grant (from RM5,000 up to maximum of RM100,000)
CREST	<ul style="list-style-type: none"> E&E companies 	E&E	Demand-driven Research Strategic Research	<ul style="list-style-type: none"> Government Industries 	<ul style="list-style-type: none"> Matching grant

Source: Economic Planning Unit

*Box 21-1***Scope of Intermediaries****The Public-Private Research Network (PPRN)**

This initiative, introduced by MoE, in collaboration with MTDC and SME Corp, aims to connect companies, especially SMEs, to researchers at the IHLs to provide solutions. It will be a catalyst for innovation, knowledge-sharing and technological advancement for local companies.

PlaTCOM Ventures Sdn. Bhd.

PlaTCOM Ventures Sdn. Bhd. is the national technology commercialisation platform. It is a smart partnership between AIM and SME Corp. The platform provides end-to-end facilitation services from concept to commercialisation of innovation including access to funding, infrastructure, testing, validation, regulatory certification, market intelligence, technical expertise and commercialisation advisory.

Steinbeis Malaysia Foundation

The Steinbeis Malaysia Foundation aims to connect academia to industry and promote effective and efficient cooperation in knowledge and technology transfers. It will enable academics and scientists to set up 'mini-entities' or 'transfer centres' to conduct short consultations, R&D and projects for private entities, commonly SMEs but also larger companies and MNCs. It provides an innovative platform for collaboration for business solutions and focuses on development of end products.

SIRIM-Fraunhofer Programme

SIRIM Fraunhofer Programme is a strategic collaboration with Fraunhofer Germany, which focuses on technology penetration and upgrading, technology audit, technology commercialisation as well as strengthening market access to boost productivity of SMEs. Through this programme, SMEs are able to develop new products and processes, solve technological problems, automate and mechanise their production processes, obtain new technologies and access calibration, testing and certification services. The SIRIM Delivery Mechanism will identify industry problems through technology audit or value chain analysis, industry engagement and direct enquiries. SIRIM will customise solutions for the identified problems to enhance technology penetration and upgrading of SMEs. The delivery of the services and KPIs will be monitored to ensure the success of the programme.

Source: Ministry of Education, Agensi Inovasi Malaysia and SIRIM Berhad

Promoting Private Financing of Research, Development, Commercialisation and Innovation

21.30 Access to financing and assistance will be strengthened through continuous engagement with private financial institutions, venture capitalists and angel investors to widen financial options, reduce dependency on Government resources and increase the financing of innovation projects. This includes the expansion of the Technology Park Malaysia Angel Chapter and early stage financing for SMEs by the SME Investment Partner programme. In addition, equity crowdfunding is an area that will be explored to widen the range of fundraising and investment products, as well as improve market access to a broader spectrum of issuers and investors. Crowdfunding is envisioned to provide financing opportunities for SMEs, start-ups and innovative businesses seeking liquidity in a more efficient and transparent manner. The enabling environment for innovation will be further strengthened by providing a clear framework for risk mitigation and management.

Social Innovation

Strategies

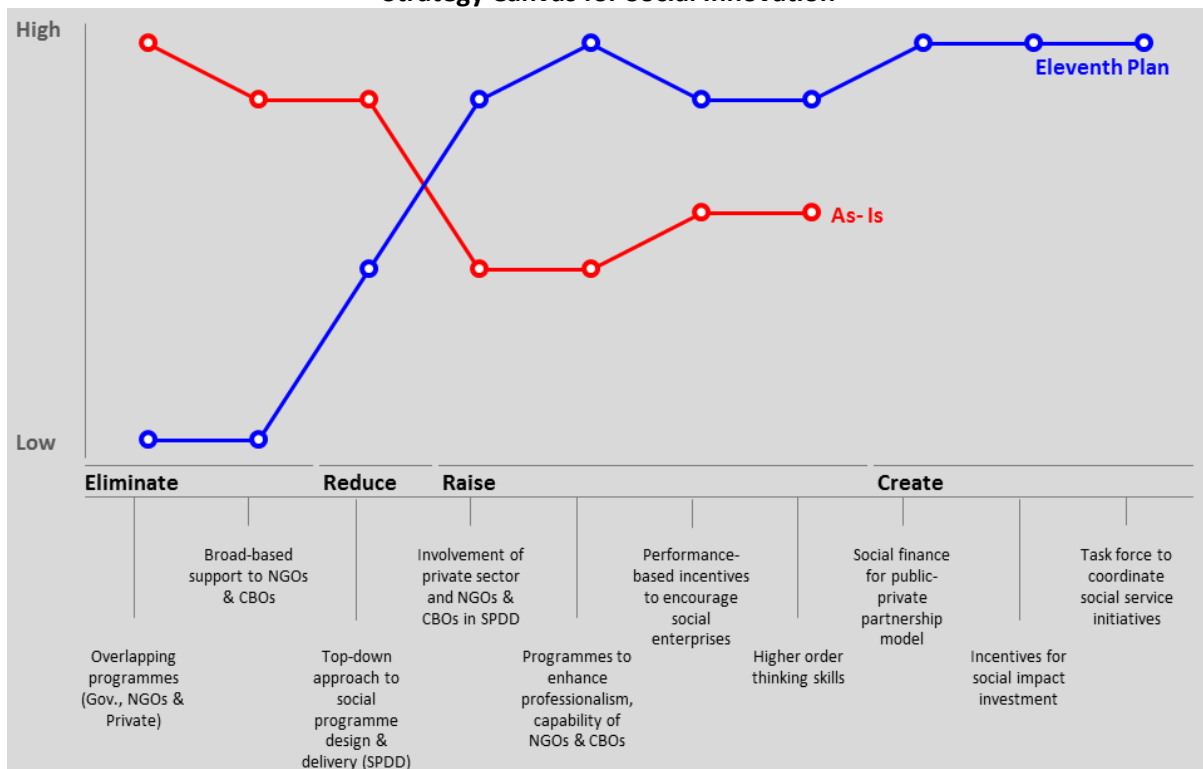
21.31 Efforts to boost innovation at the societal level are based on three strategies, namely:

- **Strengthening collaboration through whole-society approach** by encouraging broader participation across Government, residents, non-governmental organisations (NGOs), organisational and community leaders for social services delivery;
- **Developing a social financing model** to promote investments from the private sector, foundations and individuals in delivering social services; and
- **Promoting higher order thinking skills to develop a dynamic society** by scaling up existing programmes such as i-Think and Genovasi, prioritising science and mathematics in education and expanding career opportunities in science and technology.

The initiatives to support these strategies are as shown in *Exhibit 21-13*.

Exhibit 21-13

Strategy Canvas for Social Innovation



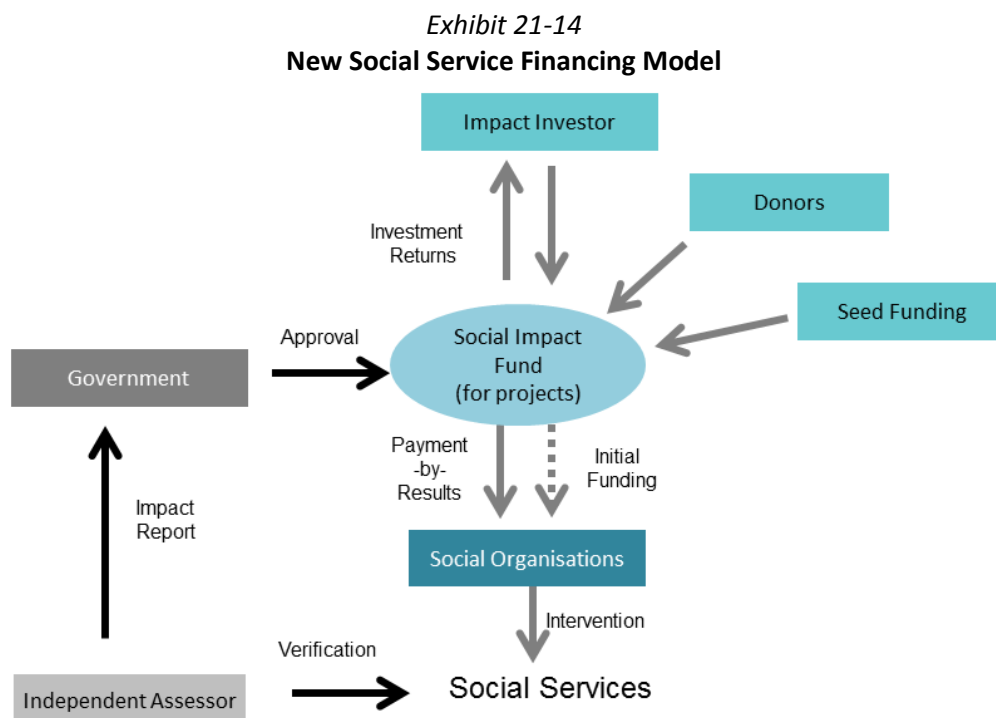
Strengthening Collaboration through a Whole-society Approach

21.32 In increasing the impact of innovation at societal level, the design and delivery of social services will shift from a top-down, government-centric approach to a whole-society approach. This approach will strengthen relational capital in social services delivery, by encouraging collaboration among Government, residents, NGOs, organisational and community leaders to optimise utilisation of resources and promote volunteerism.

21.33 A special task force will be established comprising representatives from relevant ministries, private sector, NGOs and community-based organisations (CBOs), to better coordinate social service programmes. The task force will be supported with the relevant expertise to provide advice on the implementation of programmes. Under this mechanism, private sector, NGOs and CBOs will be involved in social services planning, design and delivery, thus, reducing the current top-down approach. Through this task force, successful community-based programmes will be replicated and the Government will assist in improving the professionalism and capabilities of NGOs and CBOs by setting clear KPIs, monitoring deliverables and evaluating outcomes as well as provide training, where necessary. At the same time, the Government will focus on targeted support to NGOs and private entities in social services delivery.

Developing a Social Financing Model

21.34 In line with the whole-society approach, a social financing model to facilitate public-private partnership programmes will be developed to promote investments from the private sector, foundations and individuals in delivering social services. Through this model, the 'payment by results' mode will be introduced, where private social impact investors will provide funding for NGOs and CBOs to implement social services and will be reimbursed by the Government when the agreed outcomes are achieved, as shown in *Exhibit 21-14*. This model will reduce the burden and risk of social services programmes through the sharing of resources and leveraging civil society's collective skills, enthusiasm and innovation capacity with the Government as a facilitator. In addition, the involvement of NGOs and CBOs will increase the flexibility in implementation of the programmes.



Source: Economic Planning Unit

Promoting Higher Order Thinking Skills to Develop a Dynamic Society

21.35 Existing HOTS programmes, including i-Think and Genovasi, will be scaled-up to inculcate the current and future workforce with critical thinking, communications and leadership skills. In addition, science and mathematics in education will also be given priority, in line with the National Education Blueprint, 2013-2025, as these subjects stimulate creativity and innovation. Career opportunities in science and technology will be expanded with the Government's emphasis on knowledge intensive and high value added industries. It is expected that HOTS will be expanded to 10,000 schools by 2020 involving 450,000 teachers and 5.2 million students.

V. CONCLUSION

21.36 Innovation is crucial for the development agenda to increase productivity and improve competitiveness. In the Eleventh Plan, efforts will be undertaken to translate innovation into new wealth for the nation. To achieve this, relational capital will be strengthened to improve coordination and enable sharing and testing of new ideas. Strategies will also be implemented to foster stronger linkages, collaboration and trust among stakeholders at both the enterprise and societal levels to ensure continuous innovation for new or improved products and processes, technologies and business models to increase productivity and competitiveness of the nation.