



PROGRESSIVE MALAYSIA

2050

Laying the Foundation for Tomorrow

What we strive for

- To be the 'Thought Leader' of the nation for matters related to science, engineering, technology and innovation.
- To pursue excellence in the fields of science, engineering and technology for the benefit of all.



Academy of Sciences Malaysia

Think Science. Celebrate Technology. Inspire Innovation

An agency under the Ministry of Science, Technology & Innovation

MEMBERS

6 Honorary Fellows **28** Senior Fellows **298** Fellows **44** Associates



MALE: 82% (267)



FEMALE: 18% (59)

Information Technology &
Computer Sciences

16



72

Biological, Agricultural &
Environmental Sciences

Engineering
Sciences

60



43

Mathematics, Physics &
Earth Sciences

Medical &
Health Sciences

60



34

Science & Technology
Development Industry

Chemical
Sciences

36



05

Social Sciences &
Humanities

Staff: 79

Experts:

133
TRSM

139
YSN

1.0 Global Scenario



GLOBAL OUTLOOK

TOP 5 MEGA TRENDS



RAPID URBANISATION



DEMOGRAPHIC & SOCIAL CHANGE



TECHNOLOGICAL BREAKTHROUGHS



SHIFT IN GLOBAL ECONOMIC POWER



CLIMATE CHANGE & RESOURCE SCARCITY

TOP 5 GLOBAL RISKS



EXTREME WEATHER EVENTS



LARGE-SCALE INVOLUNTARY MIGRATION



MAJOR NATURAL DISASTERS



LARGE-SCALE TERRORIST ATTACKS



MASSIVE INCIDENTS OF DATA FRAUD/THEFT

2050 VISION

IN OTHER NATIONS

UNITED KINGDOM
Smart & Sustainable Nation

EUROPEAN UNION
Sustainable Lifestyles

FINLAND
Sustainable Development

JAPAN
Society 5.0 (Super Smart Society)

CHINA
Major power in SET

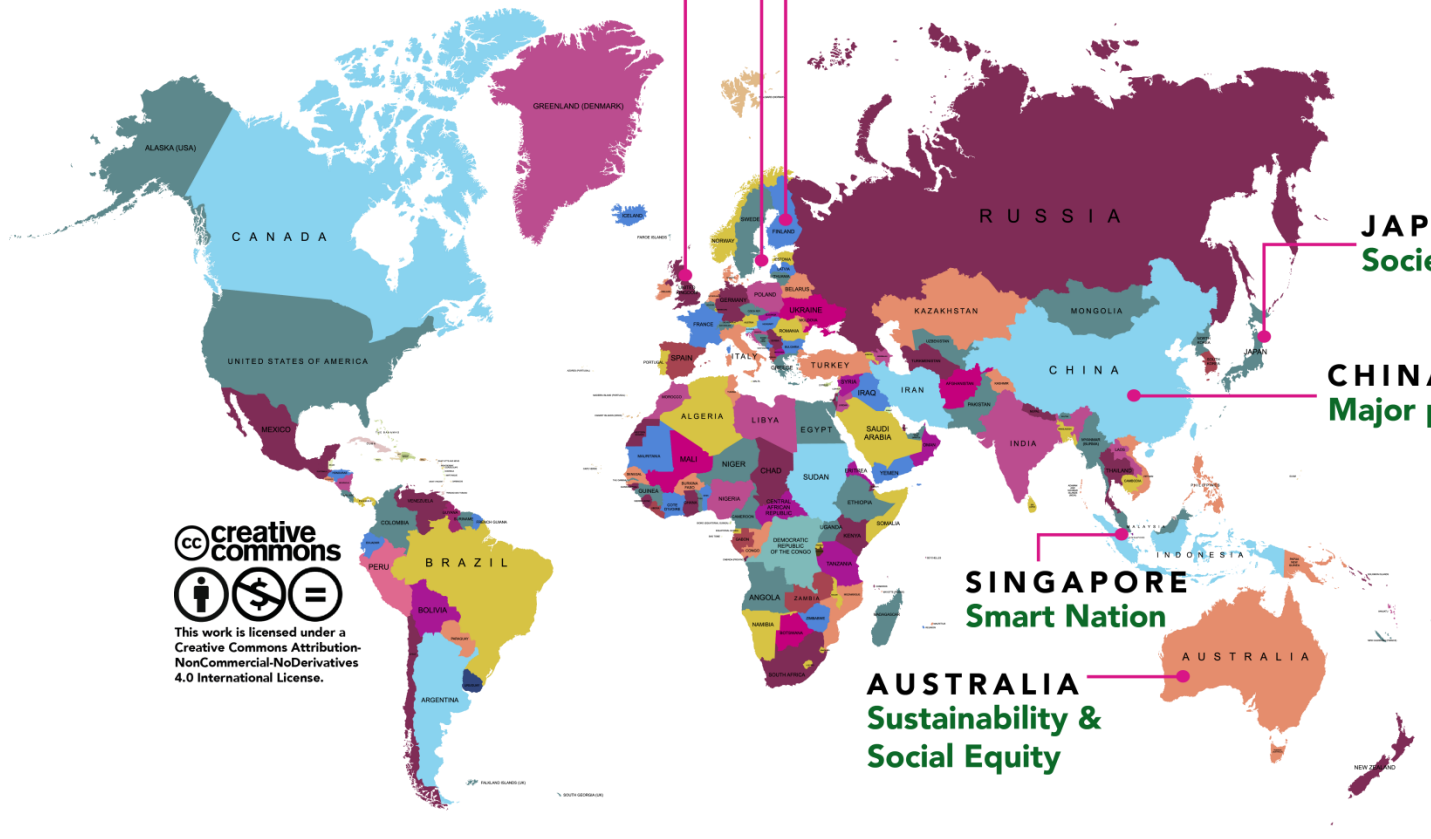
SINGAPORE
Smart Nation

AUSTRALIA
Sustainability & Social Equity

 creative commons



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FOURTH INDUSTRIAL REVOLUTION

Adoption in other nations

UNITED KINGDOM
Innovate UK Strategy 2016-2020

ITALY
Fabbrica del Futuro
(Factory of the Future)

JAPAN
Japan Revitalisation
Strategy 2016

CHINA
'Made in China 2025'
National Initiative

SOUTH KOREA
Roadmap for
Fourth Industrial
Revolution

SINGAPORE
Research Innovation
Enterprise 2020
Plan (RIE2020)
under Sixth Science
& Technology Plan

GERMANY
Industrie 4.0 under
German High Tech
Strategy 2020 Action Plan

FRANCE
Industry of
the Future

USA
Smart
Manufacturing
Leadership
Coalition

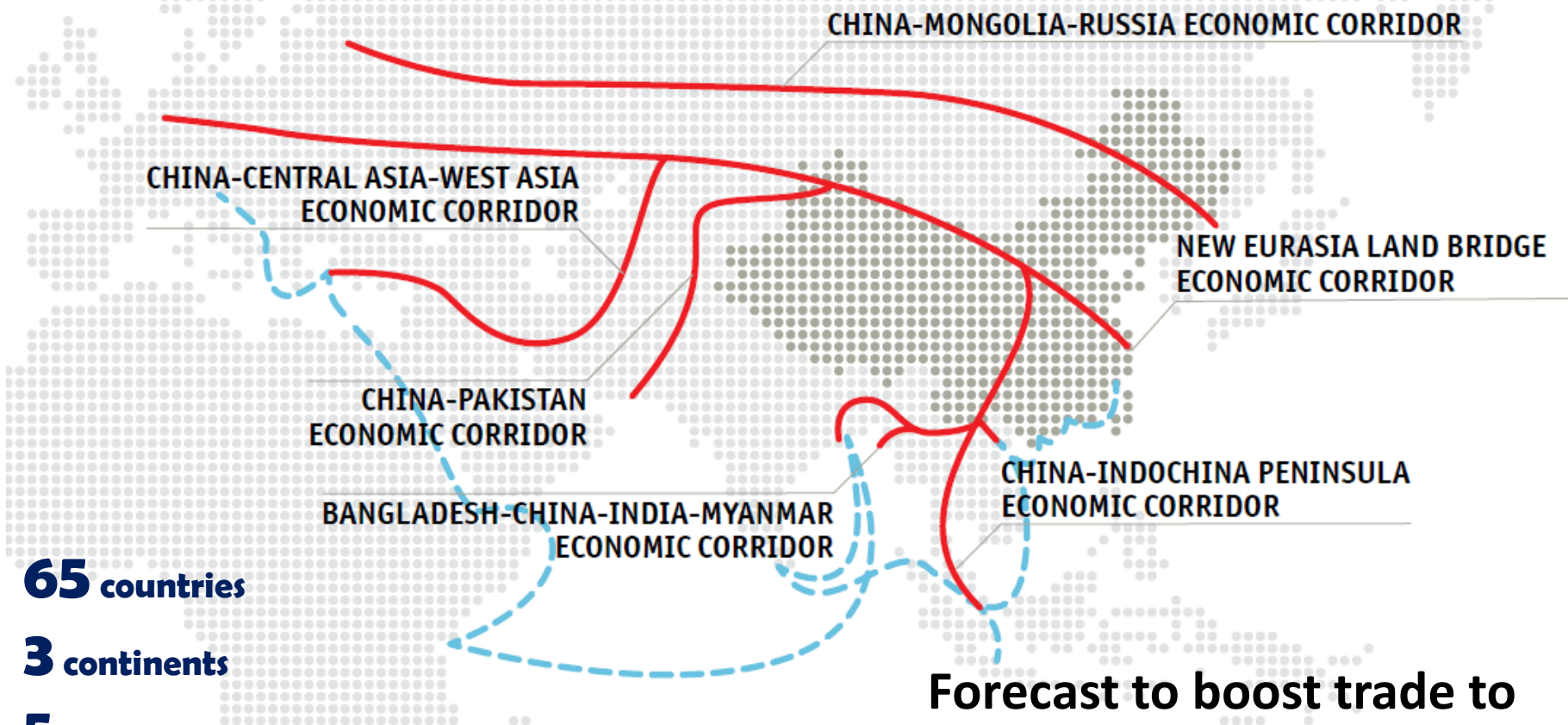


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Fourth Industrial Revolution

Industry 4.0
(Smart Manufacturing Industry)

China's Belt and Road will Reshape the 21st Century Economy



65 countries

3 continents

5 routes

6 international economic co-operation corridors

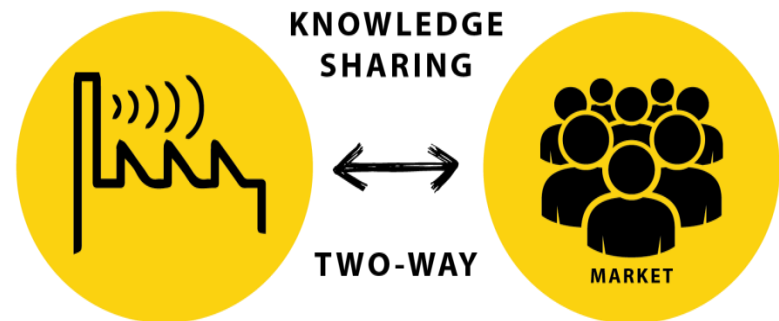
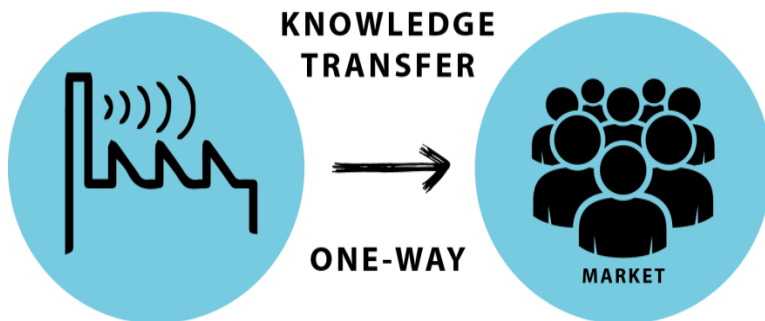
30% of the world's GDP

Forecast to boost trade to
US 2.5 tn per year in the next
decade and reaching 63% of
the world population.

Source: The Economist Intelligence Unit, 2016
The Fung Business Intelligence Centre, 2016

TRANSFORMATION FROM TRADITIONAL TO NEW ECONOMY

Resource focused	→	Knowledge intensive
Labour intensive	→	High-skilled talents
Requires control	→	Requires collaboration
Vertical	→	Horizontal trust orientation
Mass production	→	Mass customization
Proximity is important	→	Location less significant
Rigid	→	Flexible
Capitalist	→	Profit Sharing



Industry 4.0

Manufacturing Sector



Manufacturing-related Services Sector

- Information and Communication Services (Digital Technology Solution Providers, System Integrators, Telecommunication Infrastructure)
- Education Services (TVET Institutions, Training Providers)
- Transportation and Storage Services (Global Supply Chain)
- Financial Services (Fintech)
- Professional Services (e.g R&D Services, Installation Services, Engineering and Design House,)

11 Smartest Companies in 2017

1. Nvidia

HQ: **Santa Clara, California**

Valuation: **\$90.9** billion

Graphic chips for video games

2. SpaceX

HQ: **Hawthorne, California**

Valuation: **\$12** billion

Interplanetary transport system

3. Amazon

HQ: **Seattle, Washington**

Valuation: **\$479.3** billion

Reinvent mobile computing
& shopping

4. 23andMe

HQ: **Mountain View, California**

Valuation: **\$1.1** billion

Genetic testing

5. Alphabet

HQ: **Mountain View, California**

Valuation: **\$673.9** billion

AI, Autonomous vehicles, AR & VR

6. iFlytek

HQ: **Hefei, China**

Valuation: **\$6.8** billion

Voice activated common systems

7. Kite Pharma

HQ: **Santa Monica, California**

Valuation: **\$5.7** billion

Immunotherapy to fight cancer

8. Tencent

HQ: **Shenzhen, China**

Valuation: **\$350** billion

Social media: WeChat

9. Regeneron

HQ: **Tarrytown, New York**

Valuation: **\$55.5** billion

Drug development using
genetic data

10. Spark Therapeutics

HQ: **Mountain View, California**

Valuation: **\$1.9** billion

Treatment for a progressive
form of blindness

11. Face ++

HQ: **Beijing, China**

Valuation: **\$1** billion

Facial recognition

Source: WEF 2017



Transformation

- The currency is called KodakCoin and will be part of a platform to help photographers and photo agencies to track and manage their digital right. This technology is known as blockchain.

Case Study: Local Motors

Founded in 2007

116 employees

52,000 community members

5 micro factories (+-22,000 sq feet)

Local Motors backed by Siemens software



TALENT OF THE FUTURE

"Today's educators are preparing students for jobs that don't yet exist using technologies not yet invented to solve problems not yet identified."

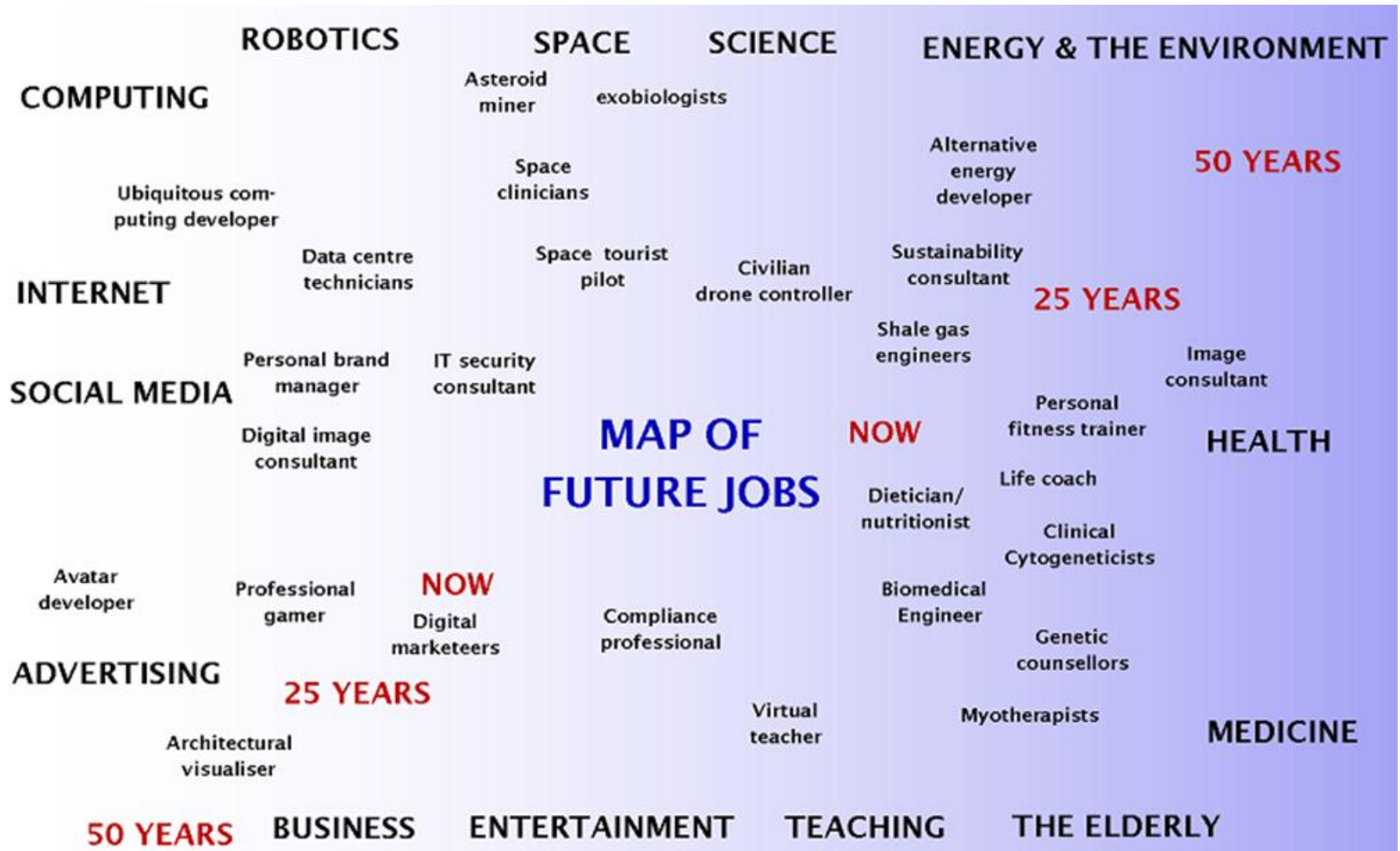
— Rick Stephens, Senior Vice President, HR, Boeing 2008



Criteria of talents in the future
(learn, unlearn, re-learn, co-learn and co-create)

From jobs to roles
Job seekers to Job creators

Future Jobs

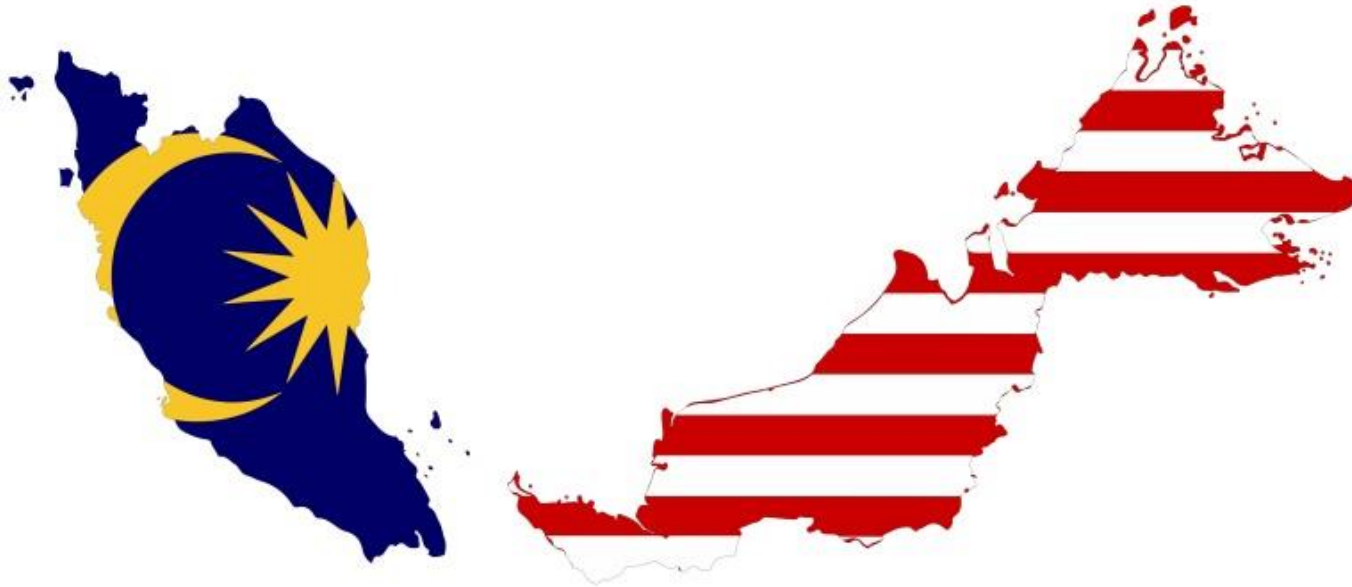


Source: University of Kent, Careers and Employability Service

2.0 Where we are now



National Initiatives



New Economy
Policy

1971

1991

Vision 2020
-6th Malaysia Plan-

ASM Malaysia
2050 Agenda

2009

2010

National
Transformation
Program

Malaysia 2050:
Foresight Initiative

2015

2016

National
Transformation
2050 (TN50)
-Budget 2017-

What have we pledged so far?



A Developed
Nation by
2020



Committed to 2030
Agenda for
Sustainable
Development



Reduce GHG
emission intensity
(per unit of GDP) to
45 % by 2030



Top 20 countries in
the world in
economy,
happiness and
creativity &
innovation



No	Economic World Bank (GDP-PPP), 2015	Happiness (World Happiness Report 2016)	Creativity and Innovative (Global Innovation Index, 2016)
1	China	Denmark	Switzerland
2	USA	Switzerland	Sweden
3	India	Iceland	United Kingdom
4	Japan	Norway	USA
5	Germany	Finland	Finland
6	Russia	Canada	Singapore
7	Brazil	Netherlands	Ireland
8	Indonesia	New Zealand	Denmark
9	United Kingdom	Australia	Netherlands
10	France	Sweden	Germany
Malaysia	26	47	35

The Future We Desire...



Harmonious



Prosperous



Sustainable



**Happiness
Index**



**Economic
Growth**



**Creativity &
Innovation**

PROGRESSIVE MALAYSIA 2050

INITIATED IN 2009

Science & Technology

Geopolitics

Society & Culture

Economy & Finance

FORESIGHT INITIATIVE

2015 -
2017

MEGA SCIENCE

2010 - 2012	1.0					
		Water	Energy	Health	Agriculture	Biodiversity
2013 - 2014	2.0					
		Housing	Infrastructure	Transportation	Environment	Electricals & Electronics
2015 - 2016	3.0					
		Furniture	Automotive	Creative	Tourism	Plastics & Composites

ESET

Emerging Science,
Engineering and
Technology

BIO, DIGITAL, NANO,
GREEN & NEURO

ESET I: 2012 – 2013
ESET II: 2015 – 2017

NEO

New Economic
Opportunities
in STI-based
Industries

2016 - 2017

Foresight Initiative

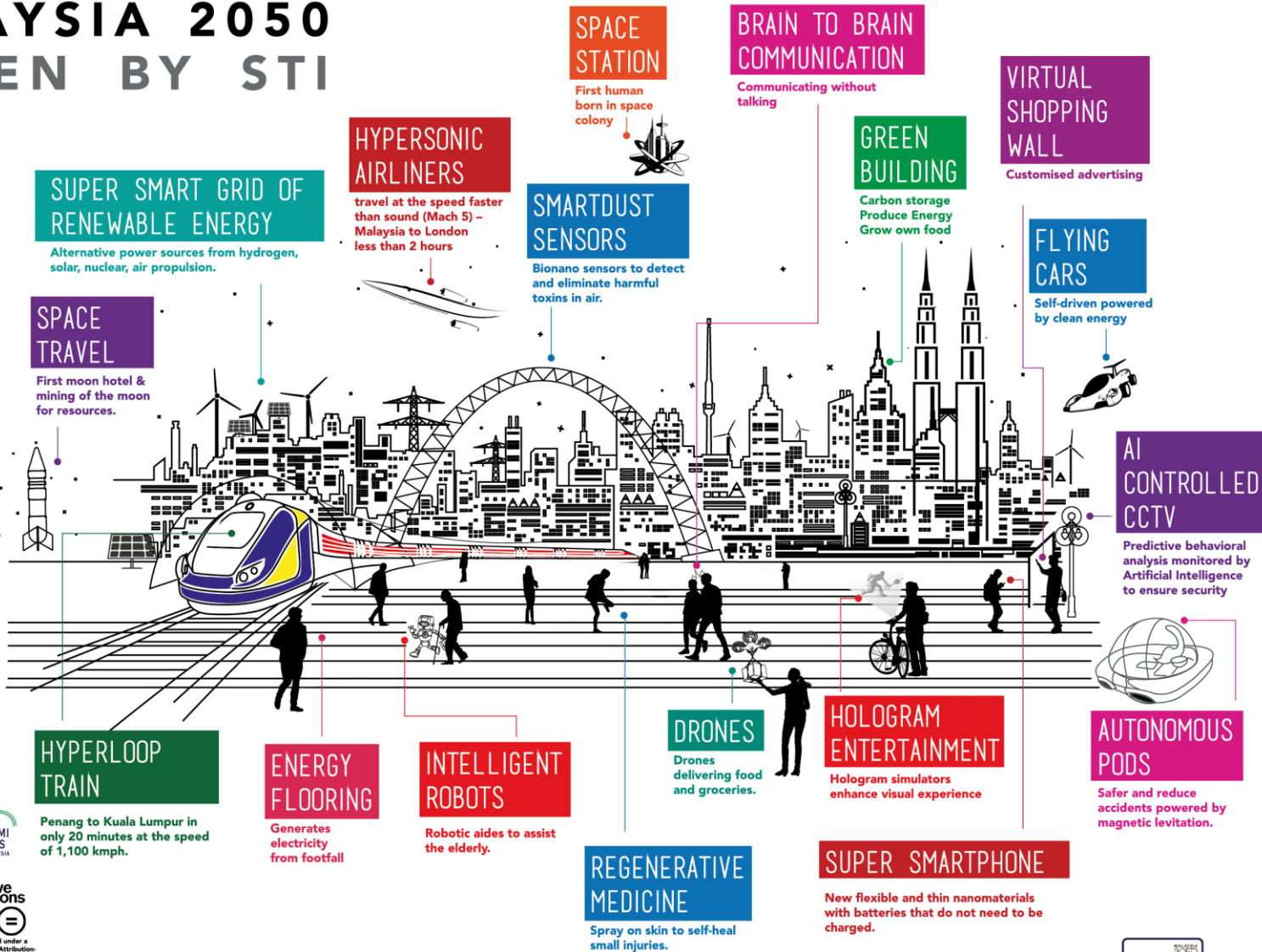
9 Key Drivers of Change



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9 key drivers towards realising SMART Communities as featured in the Malaysia 2050: Foresight Initiative
If you'd like to know more about this work, please go to www.akademisains.gov.my to contact us.

PROGRESSIVE MALAYSIA 2050 DRIVEN BY STI

Foresight Initiative



Mega Science (MS) Studies

MS 1.0 (2010): 5 SECTORS (WEHAB)



Water



Energy



Health



Agriculture



Biodiversity

RATIONALE

Addressing
basic
necessities

MS 2.0 (2013): 5 SECTORS (HITEE)



Housing



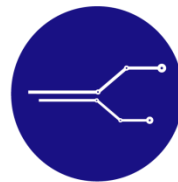
Infrastructure



Transportation



Environment



Electricals &
Electronics

Tackling
people's
well-being

HOW
STI
PLAYS
A ROLE

MS 3.0 (2015): 5 SECTORS (FACT/PC)



Furniture



Automotive



Creative



Tourism

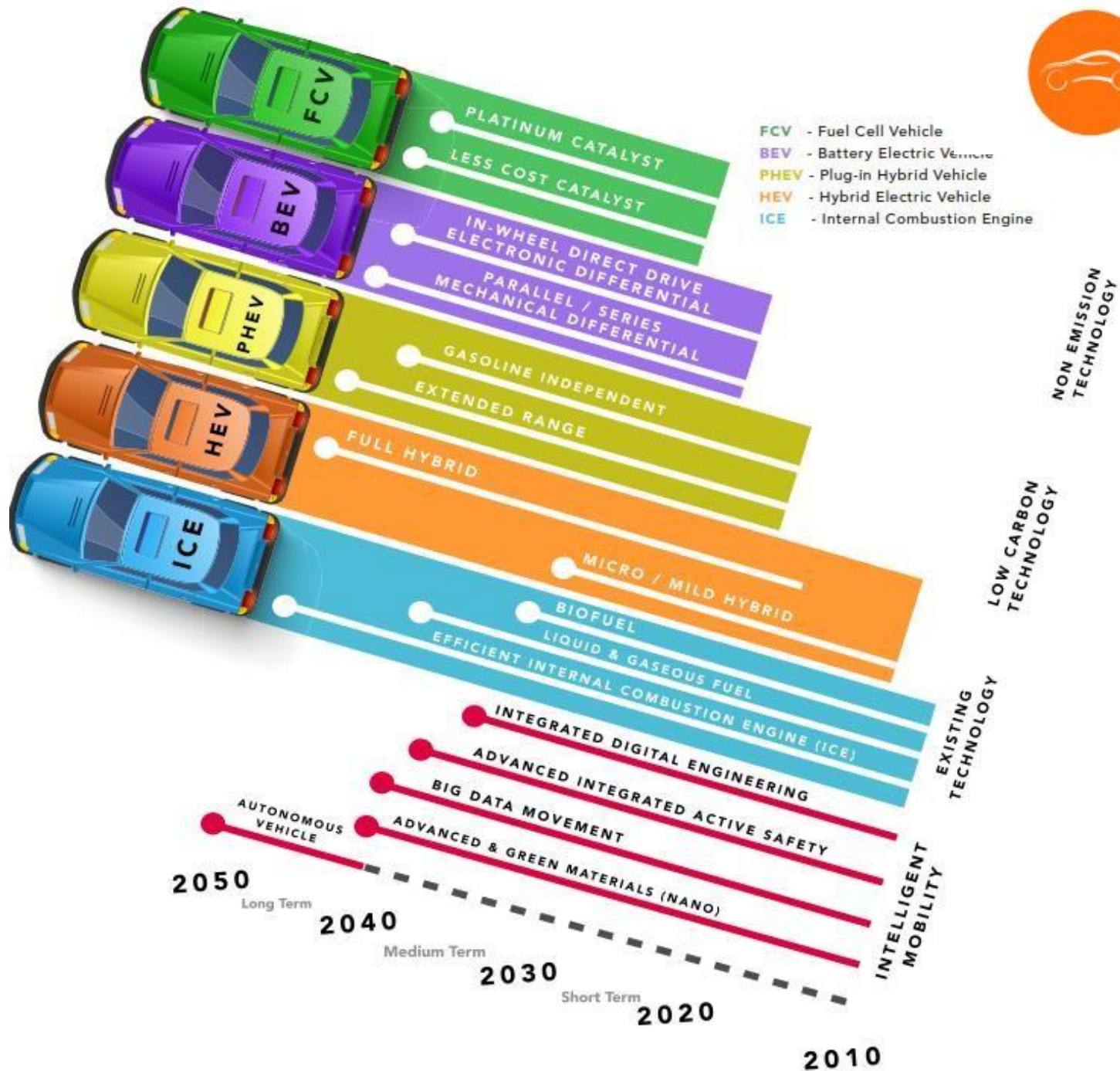


Plastics & Composites

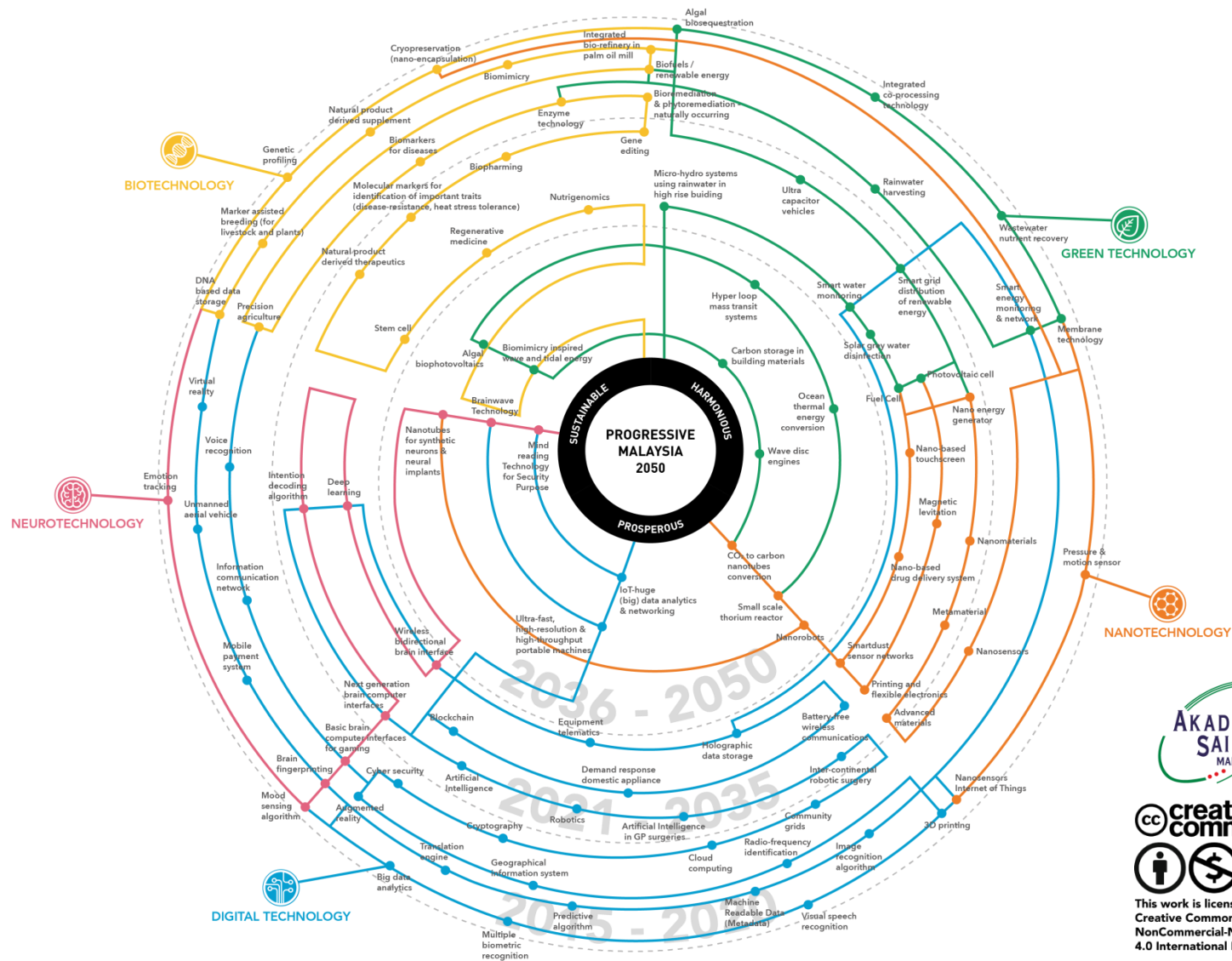
Catalysing key
economic
sectors
through
STI for wealth
creation



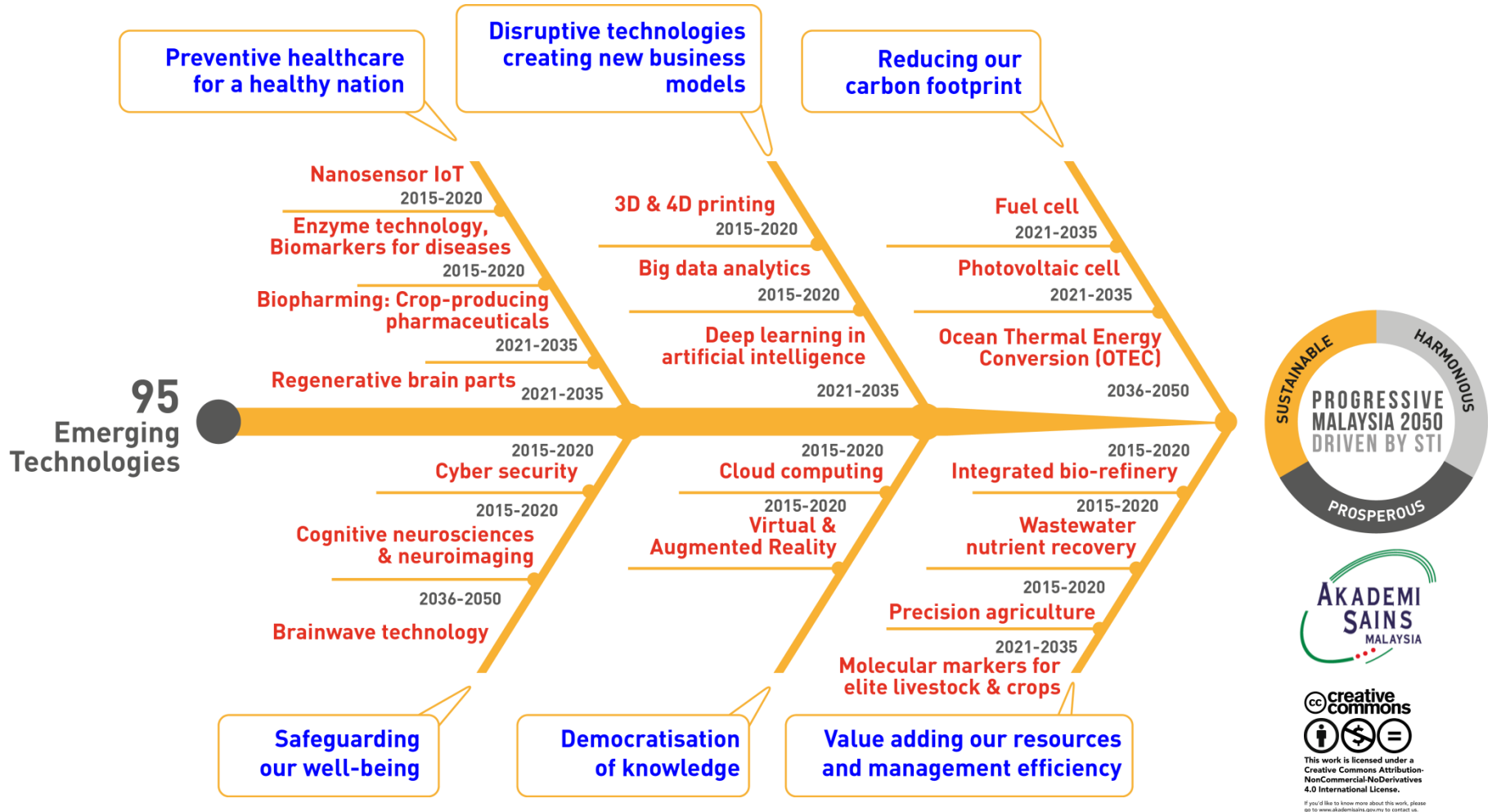
Automotive



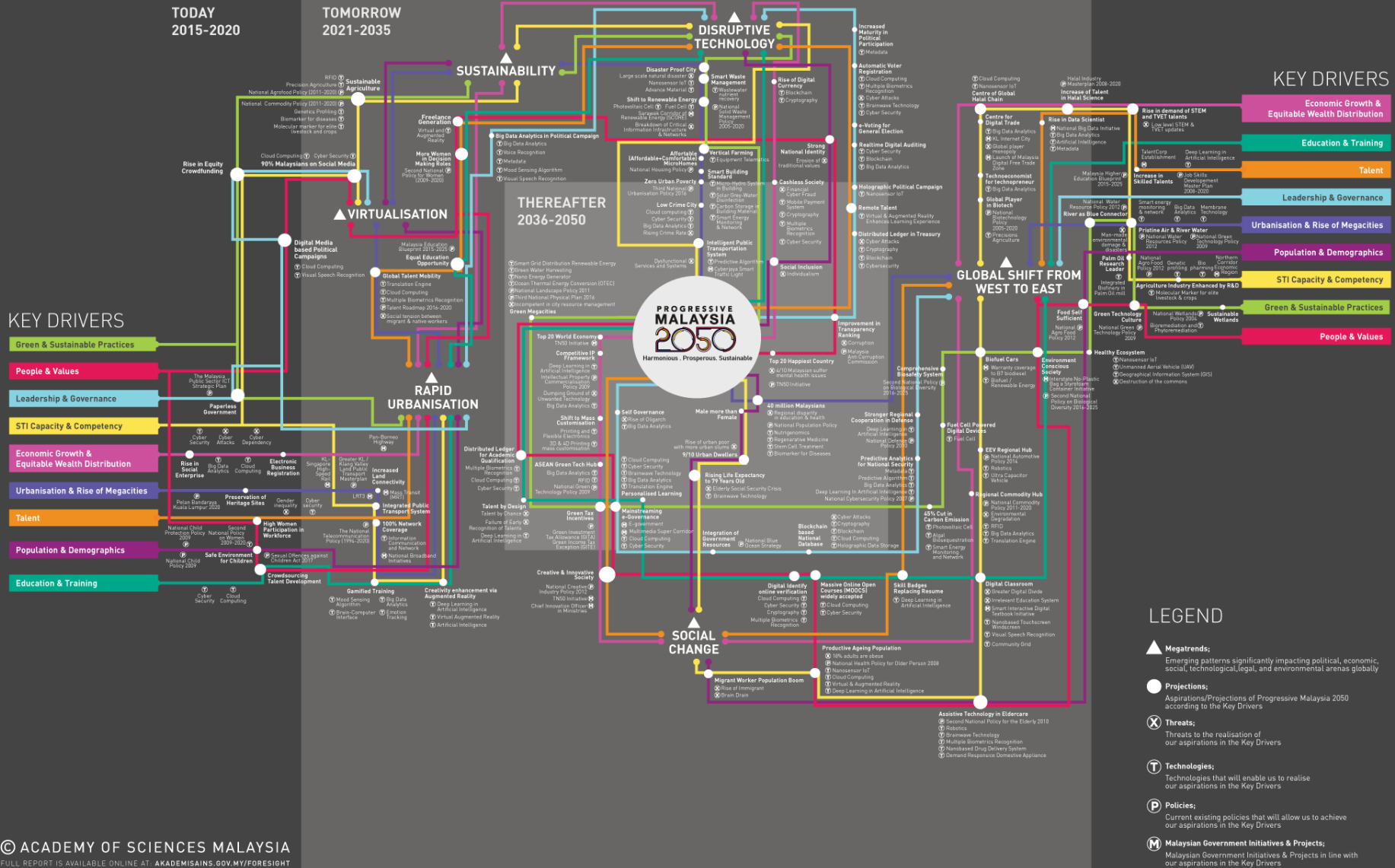
Emerging Science, Engineering and Technology (ESET) Malaysia's 95 Emerging Technologies 2015 - 2050



Technology Tree : 20 Impactful Emerging Technologies for Malaysia's Well-Being, Wealth Creation and Governance



PROGRESSIVE MALAYSIA 2050:
TRENDS AND ATTRIBUTES MAP



3.0 Proposed Strategies

TRANSFORMATIONAL SHIFTS FOR 9 DRIVERS

FROM

TO

LEADERSHIP & GOVERNANCE

- | | |
|---------------------------------|---|
| Administrative delivery | • Innovative services |
| Post-truth decision making | • Evidence-based decision making |
| Gradual governance and policies | • Agile and responsive governance and policies |
| Centralised decision making | • Empowered, facilitative and decentralised decision making |

ECONOMIC GROWTH & EQUITABLE DISTRIBUTION

- | | |
|---------------------------------------|--|
| Industry-driven economy | • People-driven economy |
| Resource intensive | • Knowledge intensive |
| Mass production of goods and services | • Mass customisation of goods and services |
| Low wage employees | • High wage employees |
| Low value-added products and services | • High value-added products and services |

EDUCATION & TRAINING

- | | |
|--------------------------------|---|
| Classroom and curriculum based | • On-demand learning and democratisation of knowledge |
| Rote learning | • Critical thinking and problem solving |
| Formal education | • Informal life-long learning education and skills |

STI CAPACITY & COMPETENCY

- | | |
|--|--|
| Scientifically aware society | • Scientifically engaged society |
| Consumer of goods and services | • Prosumers of goods and services |
| Silo approach in research, development and commercialisation | • Collaborative network approach in R, D & C |

TRANSFORMATIONAL SHIFTS FOR 9 DRIVERS

FROM TO

PEOPLE & VALUES

Tolerant of the differences in a plural society	• Respect and understanding of the differences in a plural society
Focusses on the bad	• Highlights the good
Individualistic and materialistic worldview	• Societal and for the greater good worldview
Wait-and-see attitude towards changes	• Proactive attitude towards changes

TALENTS

Job seekers	• Job creators
Low skilled migrant talents	• High skilled local talents
One skillset for a lifetime	• Many skillsets for lifelong through reskilling
One job for one career	• Different roles for one career
Permanent employment	• Freelancers in a gig economy

POPULATION & DEMOGRAPHICS

Centralised services	• Decentralised services
Services and infrastructure catered to a young growing population	• Services and infrastructure catered to ageing slow population
Reactive healthcare	• Preventive healthcare
Social protection for a young and productive population	• Social protection for a rising dependency ratio

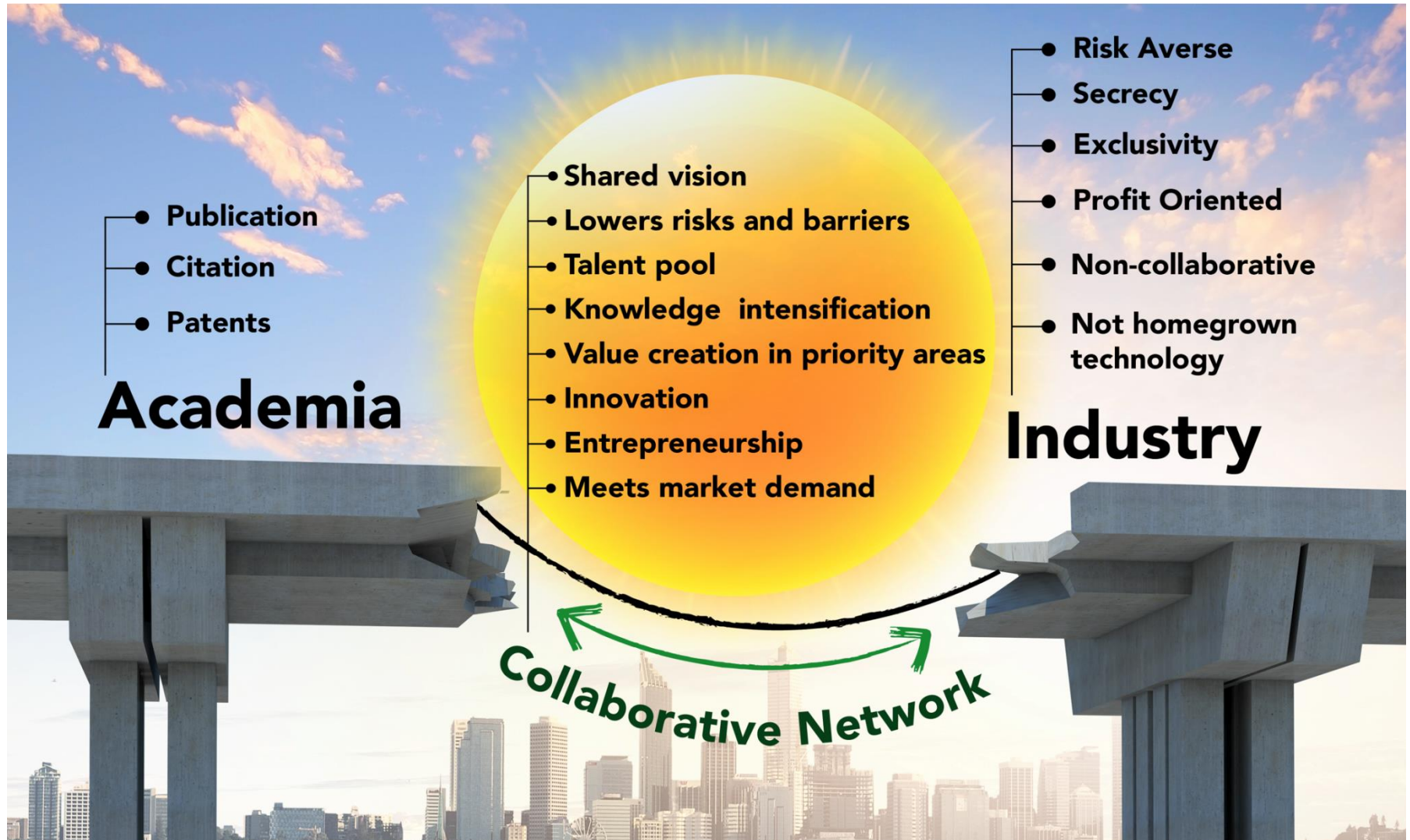
URBANISATION & RISE OF MEGACITIES

Concentrated development	• Well-balanced and well-spread development
Disconnected infrastructure and services	• Well-connected infrastructure and services

GREEN & SUSTAINABLE PRACTICES

Practices towards short-term gains	• Practices towards long-term sustainability
Waste and linear economy	• Circular and shared economy
Over-consumption society	• Sustainable consumption society
Green & sustainable practices out of enforcement	• Green & sustainable practices out of awareness

Collaborative Network to Bridge the Innovation Chasm



Lesson Learnt: Collaborative Network for Disruptive Innovation

REALITY CHECK



INDUSTRY GROWTH
CHALLENGES



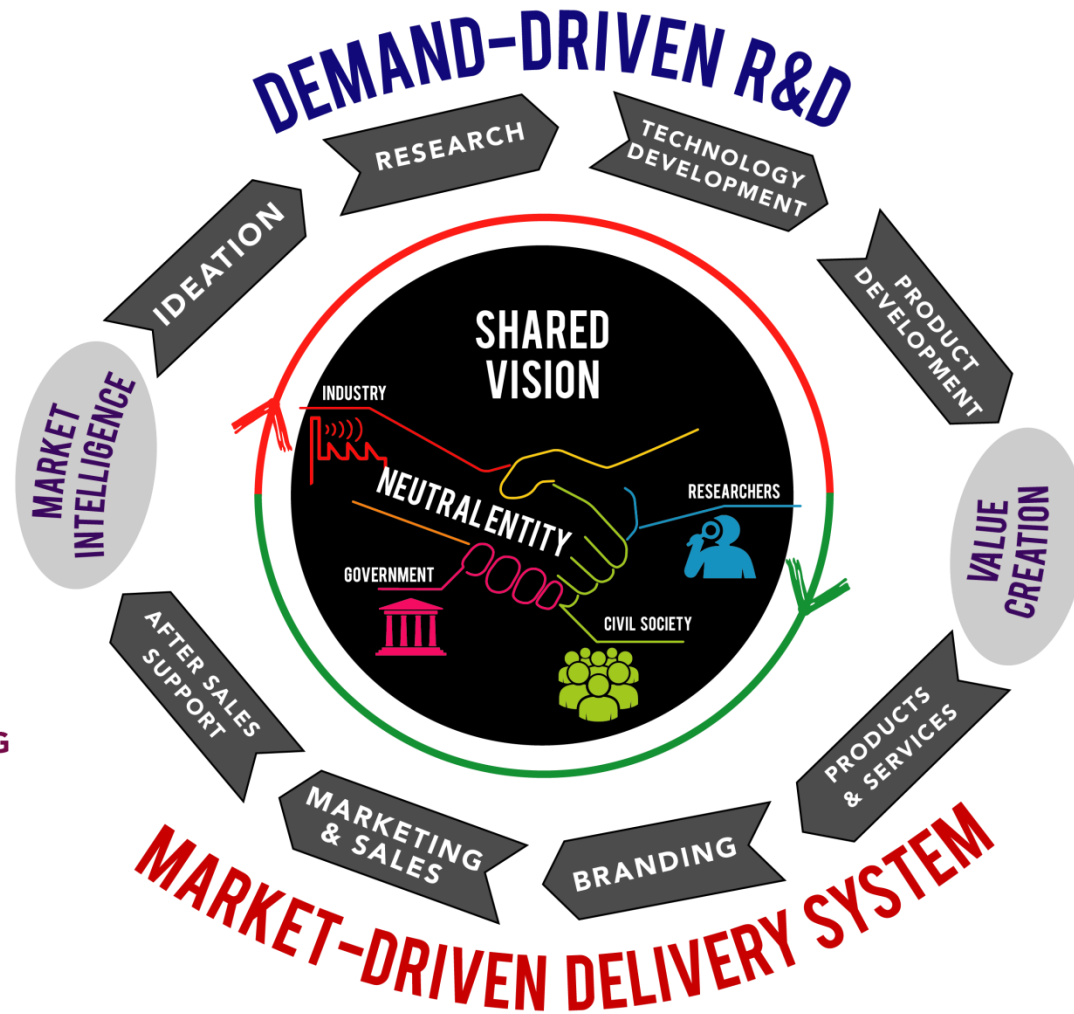
INDUSTRY-DRIVEN
STRATEGIC PLANNING



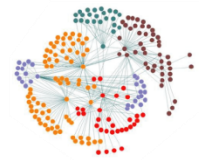
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Collaborative Network for Disruptive
Innovation as featured in the New Economic
Opportunities in STI-based Industries to
serve Emerging Markets Report

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OUTCOMES



KNOWLEDGE
CLUSTERS







TALENT HUB



DISRUPTIVE
INNOVATION

New Economic Opportunities (NEO)

INDUSTRY	WHERE WE ARE...	OUR STRENGTHS	STI BASED ENABLERS	FOCUS AREA
 Manufacturing	23% GDP 2015 <small>BNM, 2016</small>	Legacy, know-how, high value	Advanced Automation & Robotics	Industry 4.0
 Services	53.5% GDP 2015 <small>BNM, 2016</small>	Global reference point & digital infrastructure	Blockchain	Fintech in Islamic Finance
 Health & Wellness	RM9.8 Billion GNI 2015 <small>PEMANDU, 2015</small>	Expertise, network & infrastructure	ICT & other Enabling Technologies	e-Health Delivery System
 Halal	7.5% GDP 2015 <small>HDC, 2017</small>	Track record, world class (certification) Strong regulatory framework	ICT based Delivery System	Halal Supply Chain

Thank You

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