

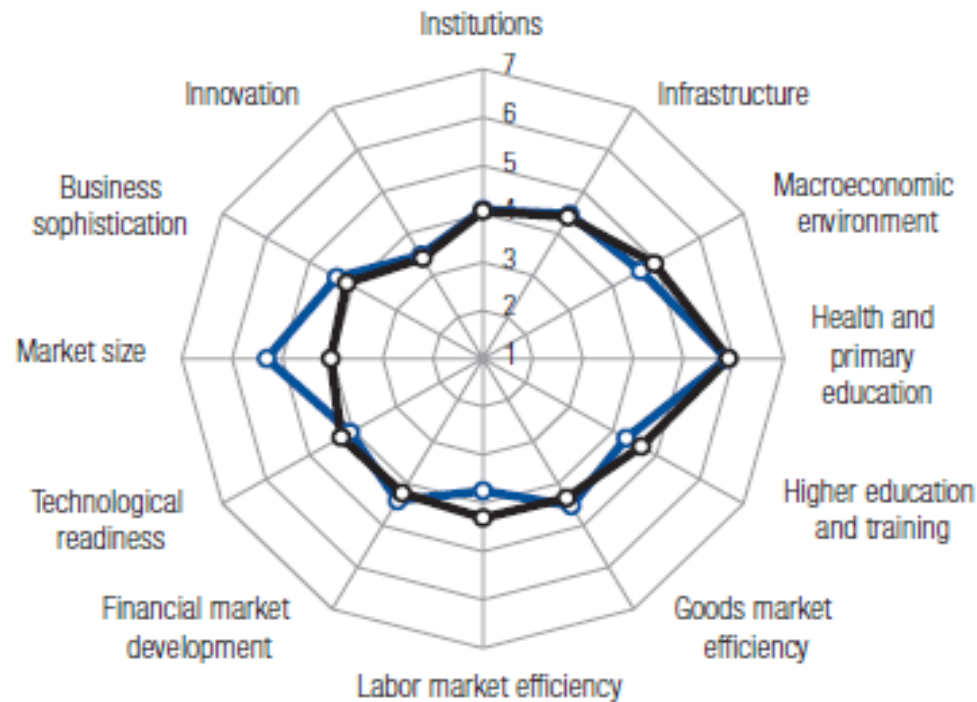
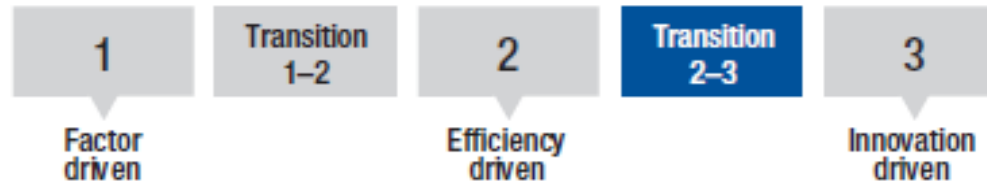
Innovation Based on Science and Technology – The Innovation Chasm and How We Can Bridge It

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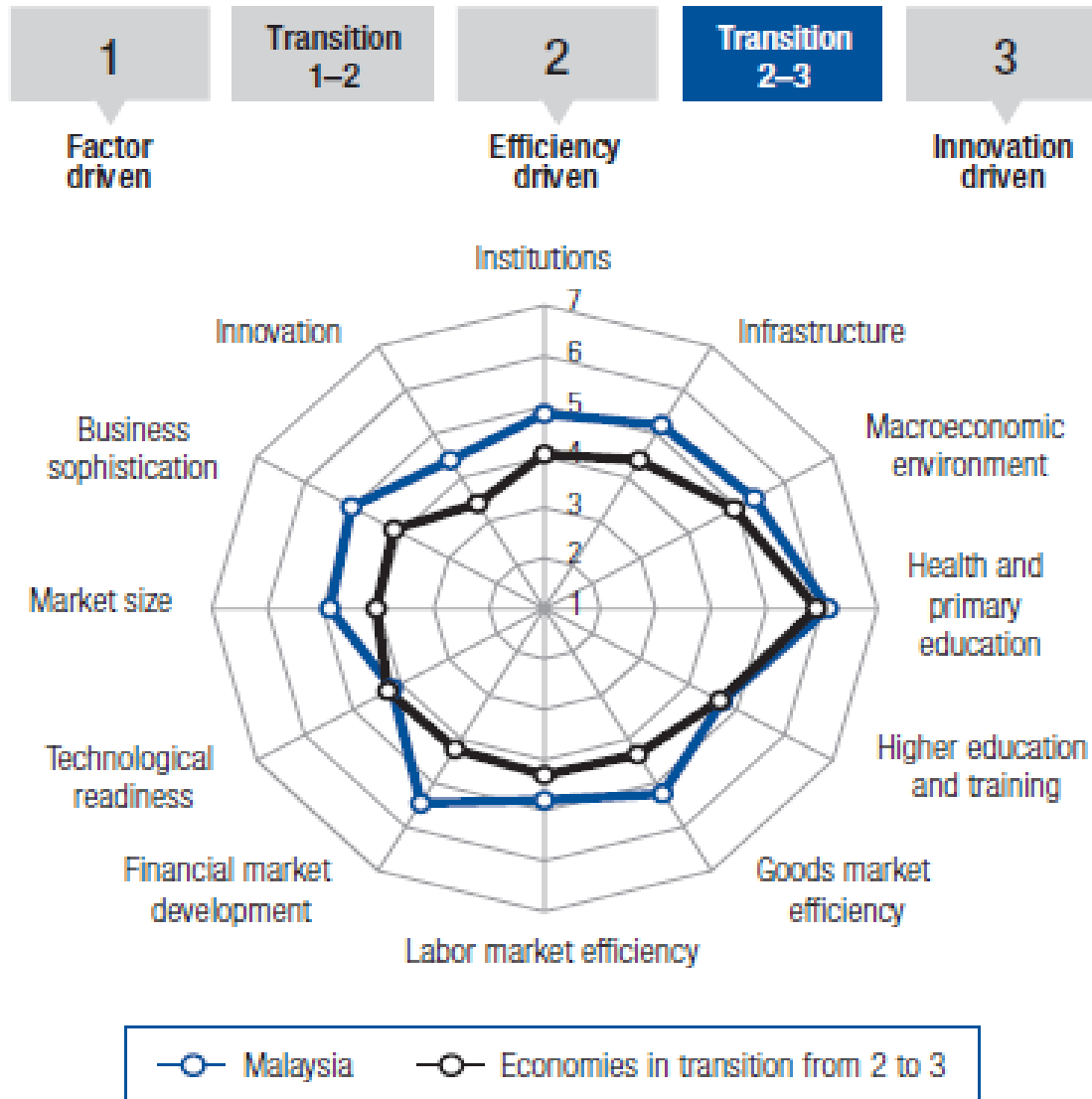
Turkey WEF Profile – Rank 44

Stage of development



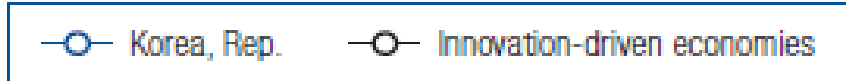
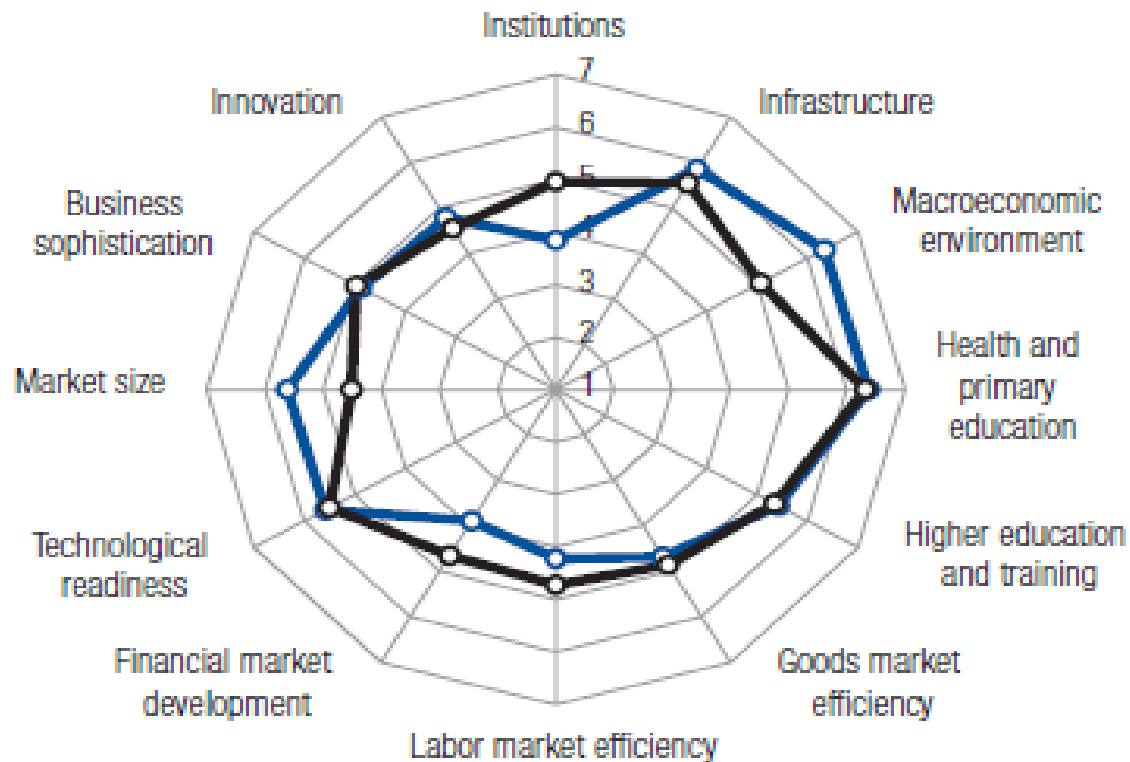
Malaysia WEF Profile – Rank 24

Stage of development



Republic of Korea WEF Profile – Rank 25

Stage of development



Contents

- The rise of the knowledge-based society and economy
- Innovation and entrepreneurship for growth and development
- The innovation challenge for developing countries
- Bridging the chasm
- Way Forward

A knowledge-based society

- A society that creates, shares and uses knowledge for the prosperity and well-being of its people
- Knowledge is the primary resource, reducing role of capital and labour
- A discontinuity from the industrial society; or its advanced form
- ICT stimulates and accelerates knowledge creation, sharing and use

A knowledge economy ... and a knowledge-based economy

- Knowledge economy – product is knowledge
- Knowledge-based economy – knowledge is enabling tool to enhance all products
- Knowledge economy is a sector
- Knowledge-based economy includes all sectors

Why innovation?

Endogenous growth theory

- Growth determined by stock of knowledge and its effective application, especially science and technology
- Land, labour and capital necessary but not sufficient
- Increasing returns to scale, not diminishing returns

World Economic Forum Growth Competitiveness Index

- Innovation is 12th pillar
- “the only self-sustaining driver of growth”

Innovation and its four categories

Innovation is the process which occurs when a new idea is applied to meet the needs of a user. It may be new to a particular producer, to a particular sector, to a particular economy or to the world. It provides a different good or service (product innovation), or applies new methods in the production of a good or service (process innovation) or combines a change in both a product and a process. Seen in this light, an innovation represents a change in technology. As the knowledge-content in production has increased, and as global value chains have continued to fragment (Kaplinsky and Morris, 2001; Gereffi et al., 2005), technological change has become increasingly intangible. That is, it affects the configuration of production systems as much as physical products and equipment. In the context of the value chain framework, innovation can be classed into four categories: product innovation, process innovation, functional innovation (changing business models and the division of labour within a value chain) and chain innovation (moving from one product chain to another).

Innovation and Entrepreneurship

Innovation

- Act that endows resources with new capacity to create wealth
- A discipline: can be learned and practised
- Means to exploit change as an opportunity
- Specific instrument of entrepreneur

Entrepreneurship

- Entrepreneurs are innovators
- Change is normal and healthy
- Doing something different, not better
- Needs purposeful search for sources of innovation
- Entrepreneur upsets and disorganises: “creative destruction”

Drucker (1985), *Innovation and Entrepreneurship*

An innovation culture

- “an integrated pattern of human knowledge, belief, and behaviour” that embraces innovation
- “the set of shared attitudes, values, goals, and practices that characterises an institution, organisation or group” that promotes innovation

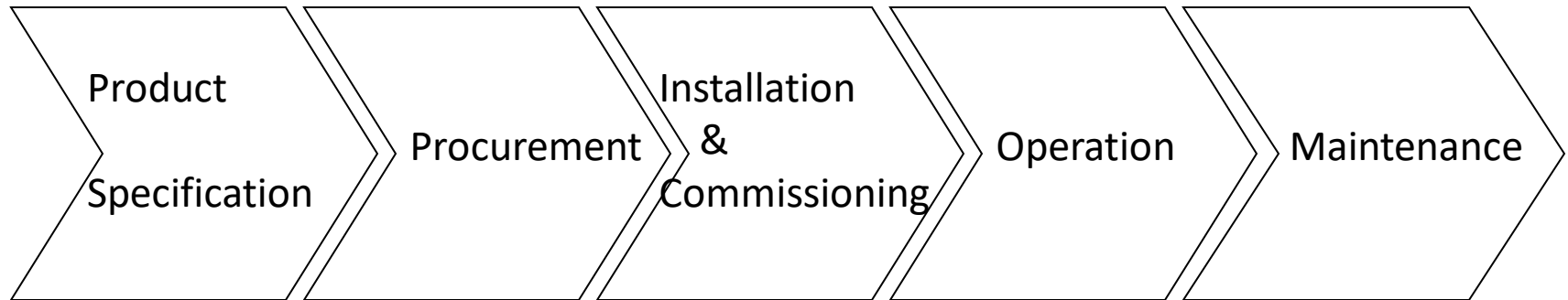
Technology transfer

“the process of developing practical applications from the results of scientific research”

Distinction to be made between 2 perspectives with different objectives:

- Consumer perspective: the achievement of operational competency and efficiency
- Producer perspective: the design, production and marketing of innovative products with high value added

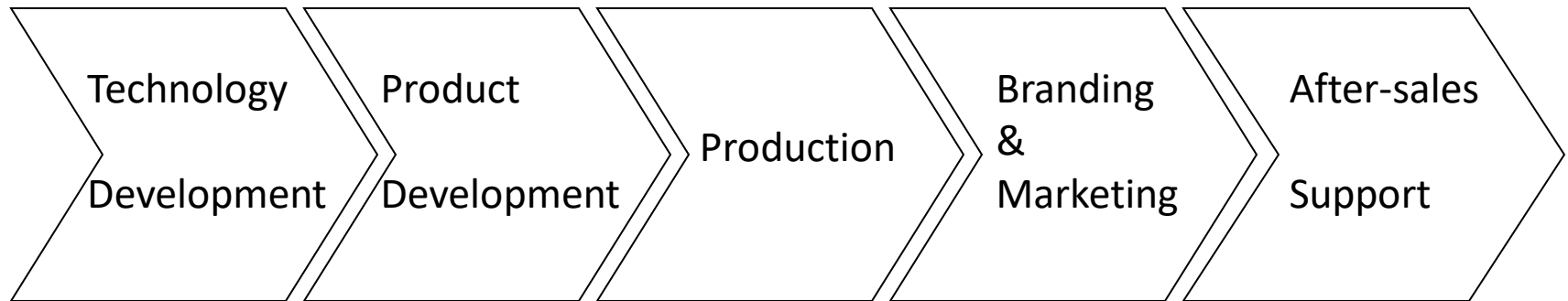
Consumer perspective – Technology- based product *acquisition* value chain



Key features

- Technology transferred is operational
- Limited scope for innovation or entrepreneurship

Producer perspective – Technology-based product *development* value chain



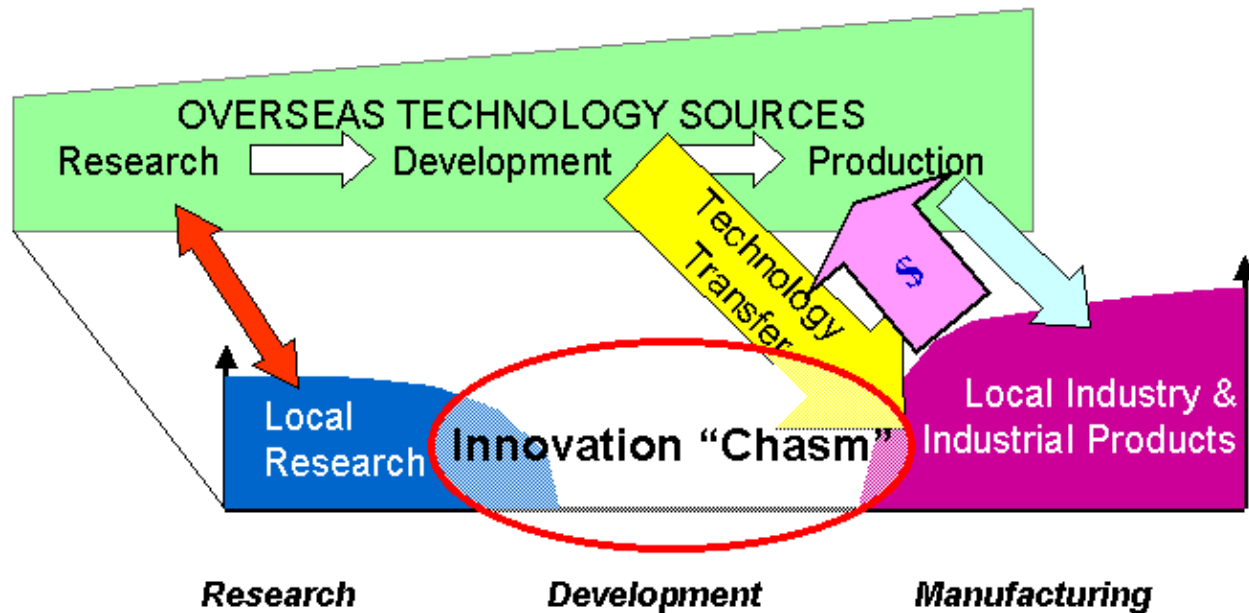
Key features

- Producers are necessarily innovators and entrepreneurs
- Endow technology with new capacity to create wealth

Developing countries are **consumers** who need to grow by becoming **producers** in areas where they have competitive advantage...but they face major challenges

- Finding technology-based innovators and entrepreneurs and nurturing them
- Gaining access to technology
- Developing products, producing and marketing them
- Creating an environment for sustainable innovation and entrepreneurship

An “Innovation Chasm” exists which must be bridged



Adapted from: "Emerging from the technology colony: A view from the South," Gideon de Wet, UP.

Why the innovation chasm occurs

- Producers and consumers operate in separate value chains, especially when producers are from industrialised countries selling products to developing countries
- Even if producers transfer production to consuming countries, knowledge and technology remain with them
- Consuming country's R&D not linked to product development process or markets, thus researchers not sensitive to consumer demand
- Consuming country's entrepreneurs lack skills and competencies to productize and monetize knowledge, thus have limited opportunity to become innovators
- Consuming countries do not generate surplus wealth to invest in serious R&D or commercialisation

The two “failure modes”

Failure mode 1: R&D players in consuming countries lack knowledge of market needs

- R&D an intellectual exercise focused on generating new knowledge
- Weak linkages to product owners or to strategic national development challenges
- Poor skills in productizing and marketing knowledge: not “knowledge entrepreneurs”

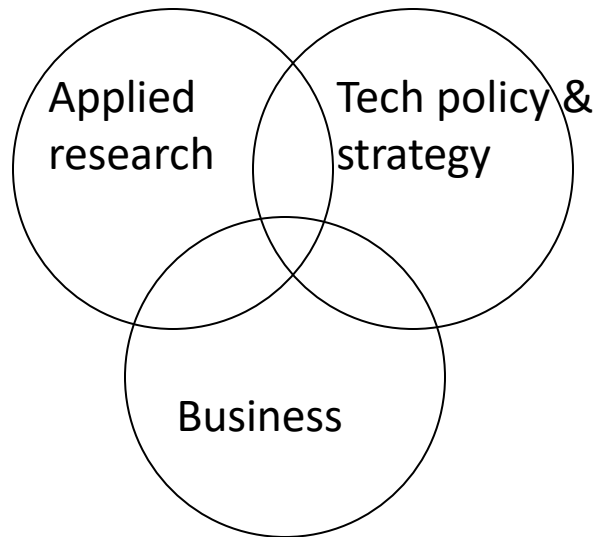
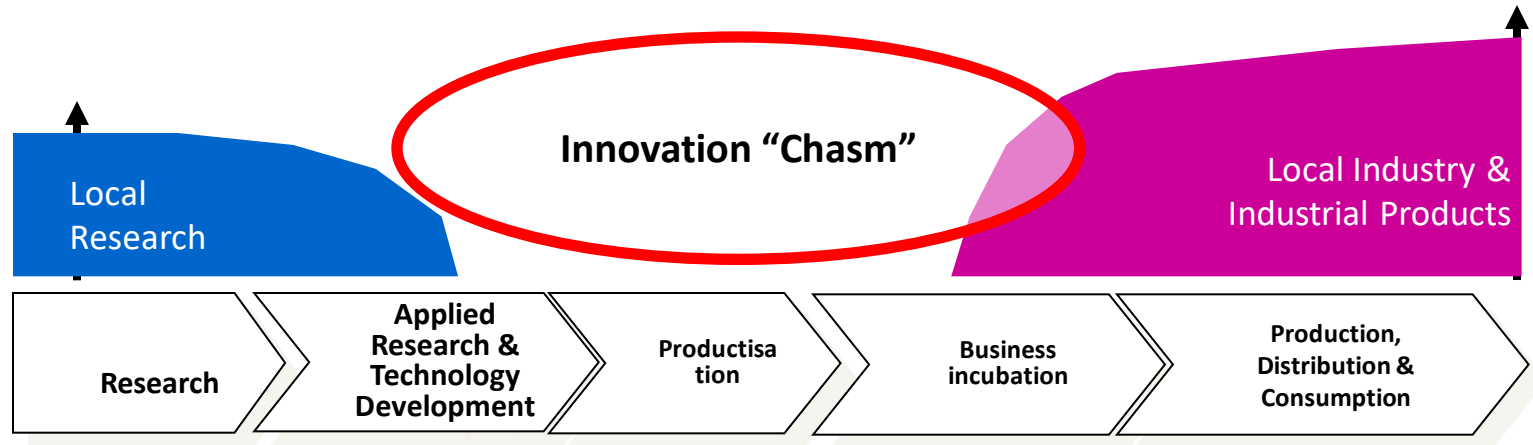
Failure mode 2: industry players in consuming countries lack skills in commercializing R&D results

- Not focused on innovation, but trading activities
- Not “technology-based entrepreneurs”
- Lack management experience and competencies to take new products to global market
- Poor market access

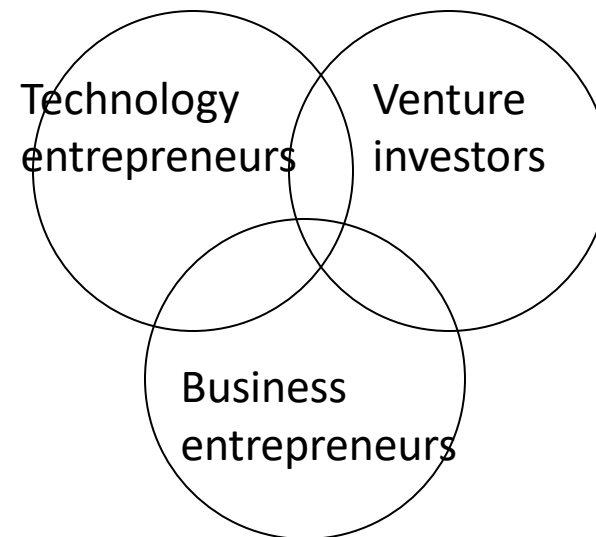
Bridging the innovation chasm to address the failure modes

- R&D players need to collaborate with technology owners and product owners to develop new knowledge with innovative potential – build global knowledge network and become knowledge hub
- Industry players need to develop in-house competencies to enable and facilitate the practice of innovation and entrepreneurship: become the champions of “creative destruction”, not its victims
- Build National Innovation Eco-systems for sustainable innovation and entrepreneurship

Two key initiatives to bridge the Innovation Chasm



Initiative 1



Initiative 2

Initiative 1: To jointly manage the *technology* incubation process

- Close interaction between researchers, policy and strategy decision-makers and business community to enhance the technology productisation process
- The end-state of this initiative is productised technology that has a validated business case
- The measure of success is that the productised technology attracts investment for full commercialisation
- Roles assumed by three key stakeholders
 - Researchers – production of technology-based creative ideas with innovative potential
 - Policy and strategy decision-makers – mediate between researchers and business community to enhance productisation of technologies that meet national priorities and create strategic synergies
 - Business community – bring business and market knowledge and experience to shape application of technology to fulfill present or anticipated customer demand

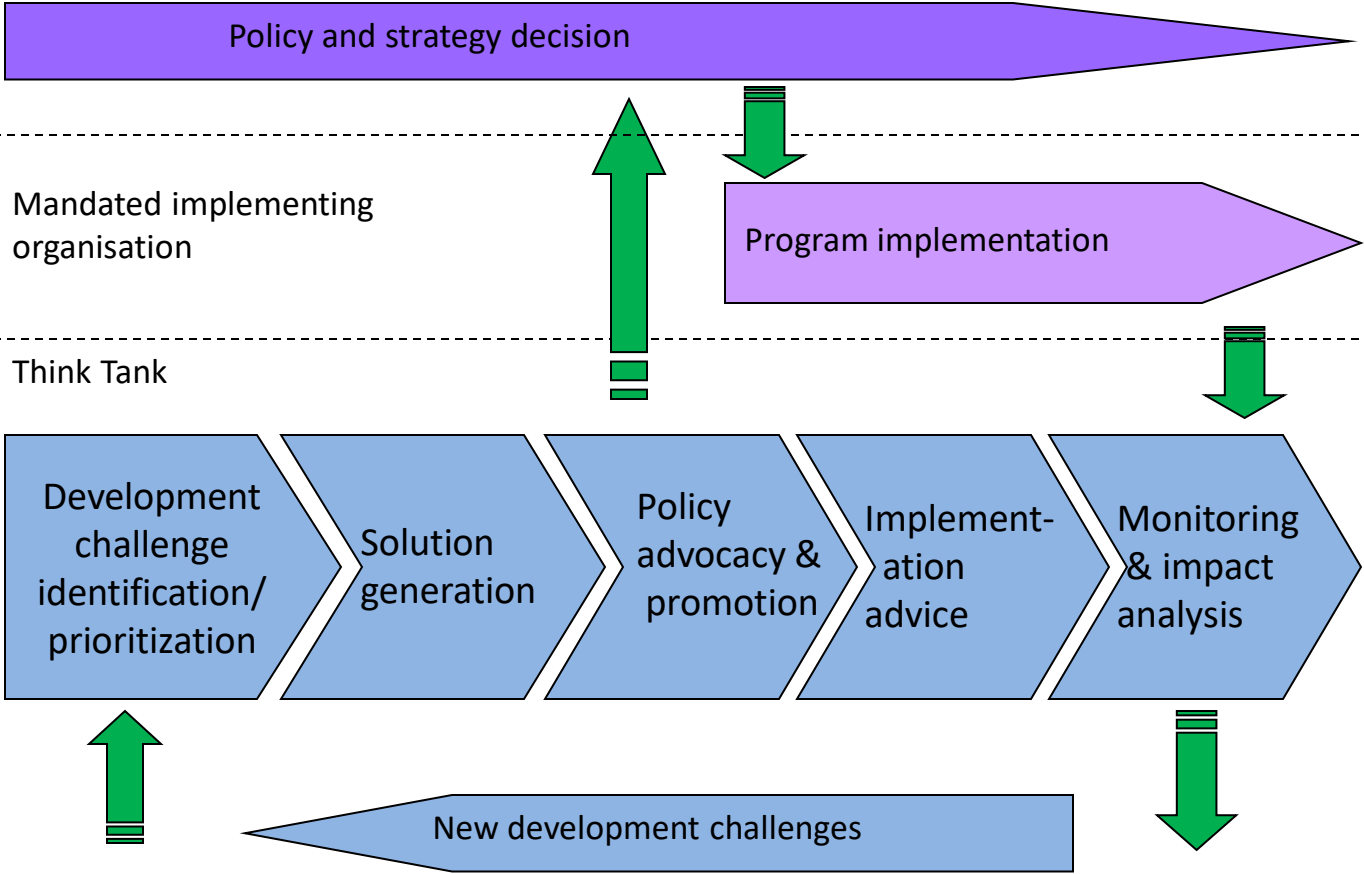
Initiative 2: To jointly manage the *business* incubation process

- Close interaction between technology entrepreneurs, venture investors and business entrepreneurs to build a viable business out of technology-based creative ideas
- The end-state of this initiative is an operating company with an attractive business plan, a functioning management team and a well-defined market-tested product
- The measure of success is that the company attracts investment for market expansion
- Roles assumed by three key stakeholders
 - Technology entrepreneurs – sustained production of technology-based creative ideas to adapt to changing market demand
 - Venture investors – shape companies to make them more competitive and put investments in selected companies
 - Business entrepreneurs – shape companies to make them more competitive and invest in and/or acquire selected companies

Way Forward

- Science and technology community to embrace innovation and entrepreneurship as enablers of development
- Developing countries should aim to become world producers, and not remain as consumers
- Find sources of innovation from needs of society
- Bridge the innovation chasm that exists in all communities and build innovation eco-systems

Policy Development and Strategic Intervention – A Structured Process Flow



PROPOSED COLLABORATIVE NETWORK

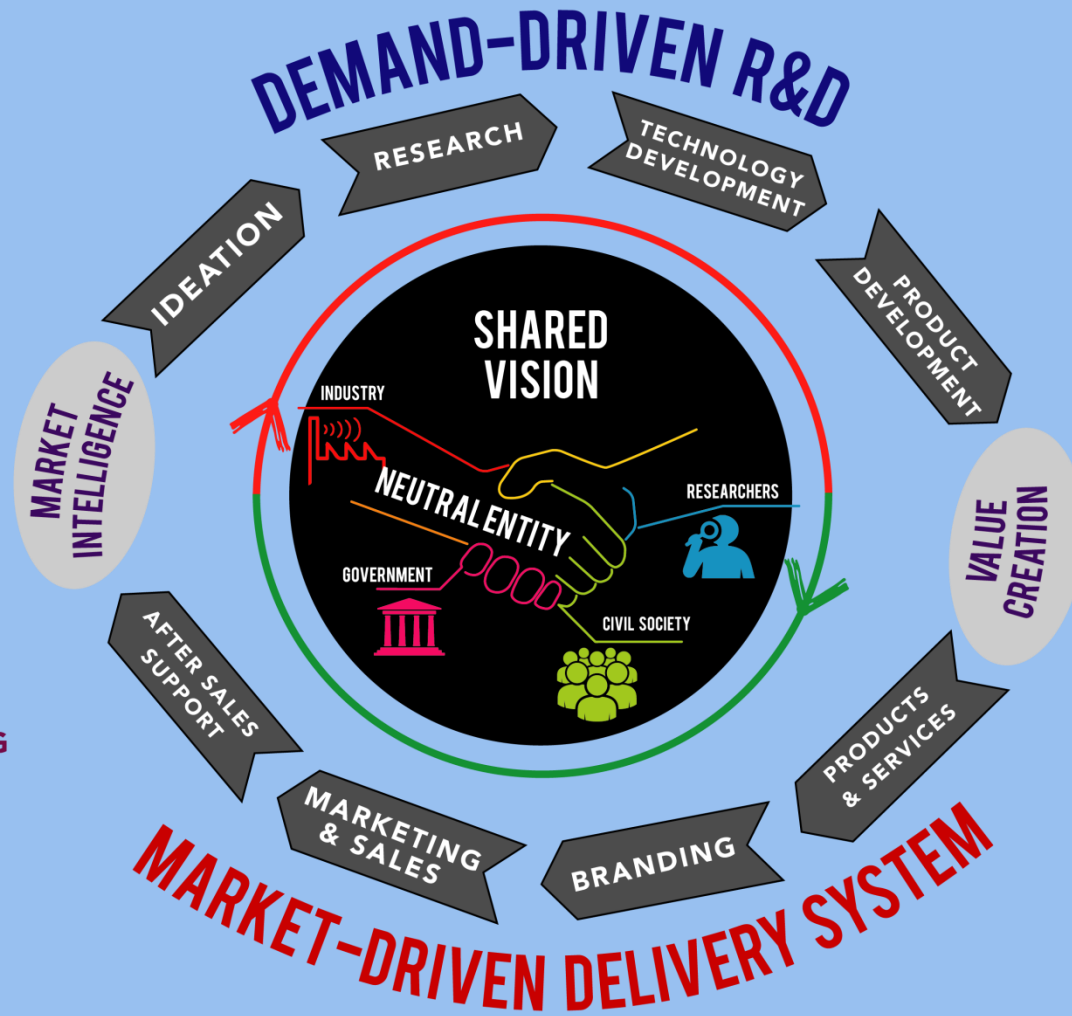
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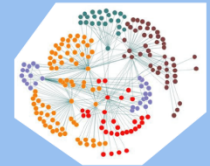
INDUSTRY GROWTH CHALLENGES



INDUSTRY-DRIVEN STRATEGIC PLANNING



OUTCOMES



KNOWLEDGE CLUSTERS



TALENT HUB



DISRUPTIVE INNOVATION

*thank you
for your attention*