MOHE Robotics and AI R&D Consortium (MRRDC) in Support of the National Robotics Malaysia (RM) Project

29 March 2018

Dewan Teknovasi, Innovation and Commercialisation Centre (ICC)

Universiti Teknologi Malaysia, Skudai

Agenda

- Why MRRDC
  - End game: Building a Sustainable Robotics Industry in Malaysia
  - The Importance of Targeted R&D
  - The Role of MRRDC
    - Knowledge Building
    - Technology Development
- Conclusion: The Need to Build a Viable Robotics Ecosystem

Agenda

- Why MRRDC
- The Need to Build a Robust Robotics Ecosystem

Why MRRDC?

- End game: Building a Sustainable Robotics Industry in Malaysia
- The Importance of Targeted R&D
- Why a Consortium?
- The Role of MRRDC
  - Knowledge Building
  - Technology Development

1. The Potential

- The Robotics Industry (**current**: Mechanisation – Automation – Robotics→ **future**:?) has a huge potential:
  i. To help overcome Malaysian Industry challenges and
  ii. To be developed to became a Major Contributor to the Malaysian Economy
- With the advent of Industry 4.0, Robotics (Autonomous Robots) has a special place in the future of Industry.

2. The Challenge

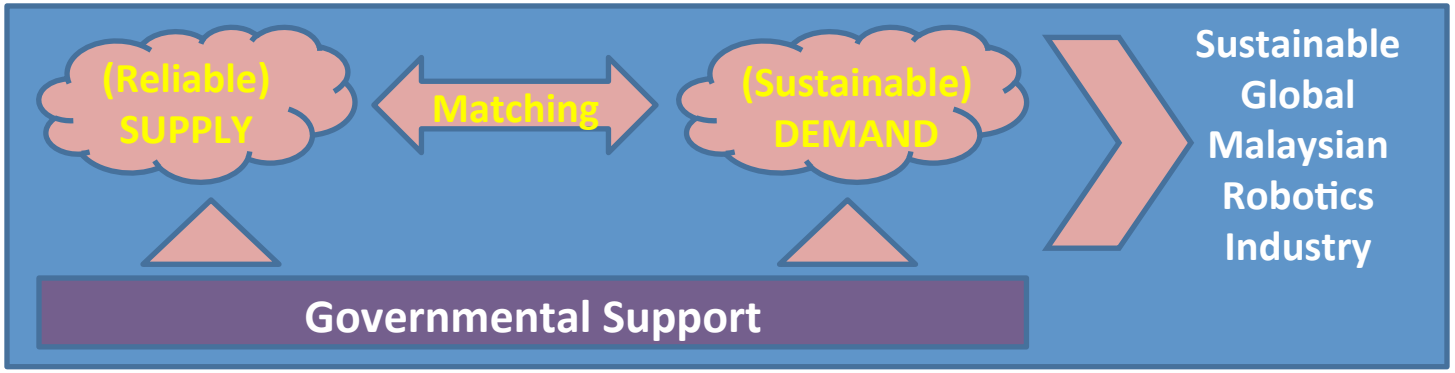
i. Why then although there is an Apparent/ Obvious need for a Robotics Solution to alleviate some of the challenges faced by Malaysia and the Malaysian Industry, the Local Malaysian Robotics Industry has not expanded in a big way?

ii. How then to develop a Sustainable and Global Malaysian Robotics Industry that will contribute to National Socio-Economic Development

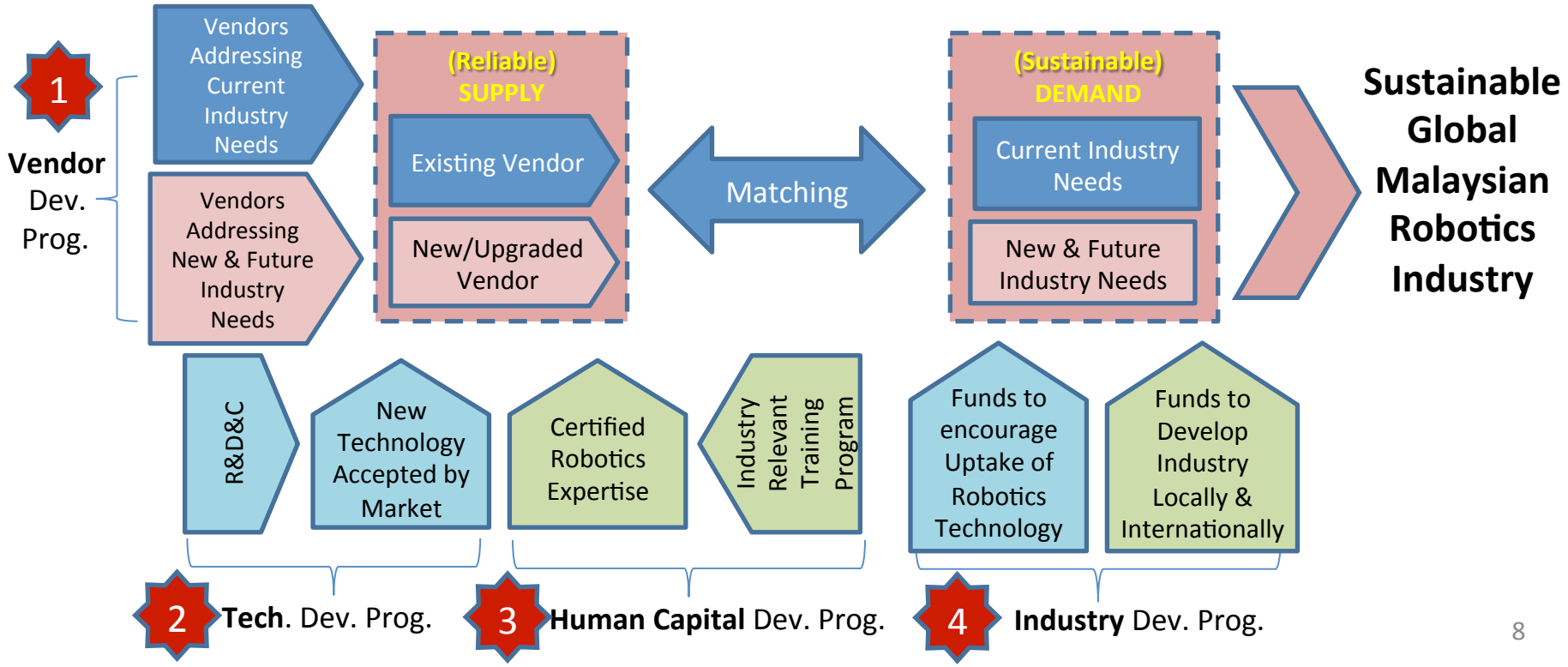
Why has the Local Robotics Industry not Expanded in a Big Way?

- At Industry Level:
  i. Matching Supply with Demand
  ii. Completing the Value-Chain
- At National Level:
  iii. Building a Sustainable Robotics Ecosystem
    - Quad Helix Model (Government, Private Sector, Knowledge Sector, Public/NGO)
  iv. Leadership Role of Government

The need to Match Supply with Demand



Matching **Sustainable Demand** with **Reliable Supply**



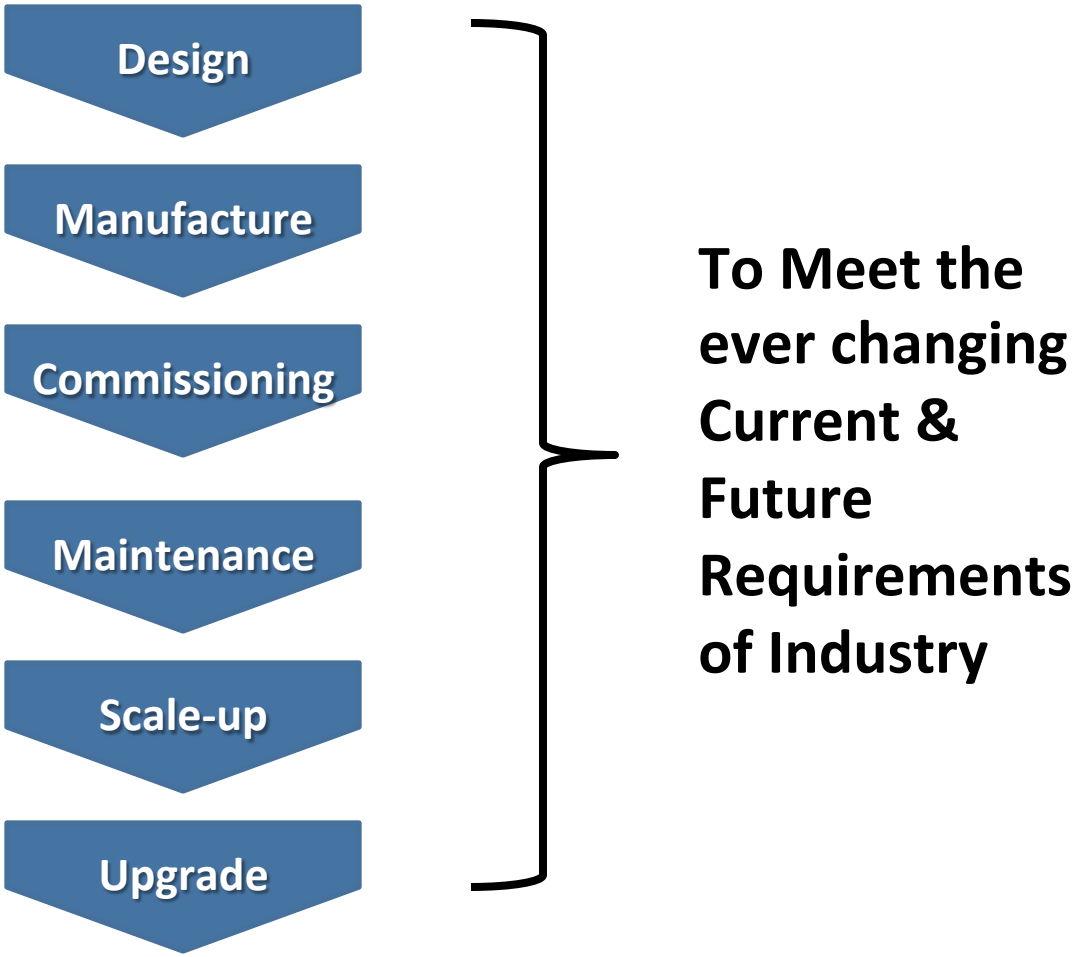
Developing **Sustainable Demand** and **Reliable Supply**

Developing Reliable Supply		
No.	Program	Output
1	Vendor Development Program	• New Robotics Vendors • Upskilled Existing Robotics Vendor
2	Technology Development Program	• New Robotics Technology • Enhanced Robotics Technology
3	Human Capital Development Program	• Expertise for ○ Users ○ Suppliers of Robtics Technology

Developing Sustainable Demand		
No.	Program	Output
4	Industry Development Program	More Users (Industry Players) use Robotics Technology
		More Robotics Vendors(SI, Suppliers) operating at Local, Regional and International levels

Completing the Robotics Value-Chain

Reliable and Robust Competency in Robotics:



To Meet the ever changing Current & Future Requirements of Industry

Why MRRDC?

- End game: Building a Sustainable Robotics Industry in Malaysia
- The Importance of Targeted R&D
- Why a Consortium?
- The Role of MRRDC
  - Knowledge Building
  - Technology Development

Targeted R&D

- Develop Local Robotics R&D Capacity
  - To Address the Current needs of Industry
  - To Support the Development and Sustainability of a Local Robotics Industry
  - Enhance the Commercialisation of Local R&D

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MOHE Robotics R&D Consortium

- Not a Physical Centre but a Consortium of Associated Institutions
- “One Stop Referral” for Robotics related Activities in MOHE
- Collects, Coordinates and Disseminate Information
- Manages Resources where appropriate
- Be Part of the National Robotics Malaysia Project

Coordinating MOHE's Resources

- In IPTAs, Politenik and Others
- Resources such as
  - Robotics Knowledge, Skills & Competency
  - R&D COEs, Skills and Resources
  - Graduates in Robotics related areas
  - Laborotary Facilities and Service COEs in Robotics
- These Resources could be used to Develop
  - Human Capital Dev. Program at all levels
  - Technology Development Program
  - Entrepreneur/ Vendor Development Program
  - Provide Resources to help develop a Robot Manufacturing/Fabrication/Maintenance Program

Why MRRDC?

- End game: Building a Sustainable Robotics Industry in Malaysia
- The Importance of Targeted R&D
- Why a Consortium?
- The Role of MRRDC as Part of RM Project
  - Knowledge Building
  - Technology Development
  - Human Resource Development

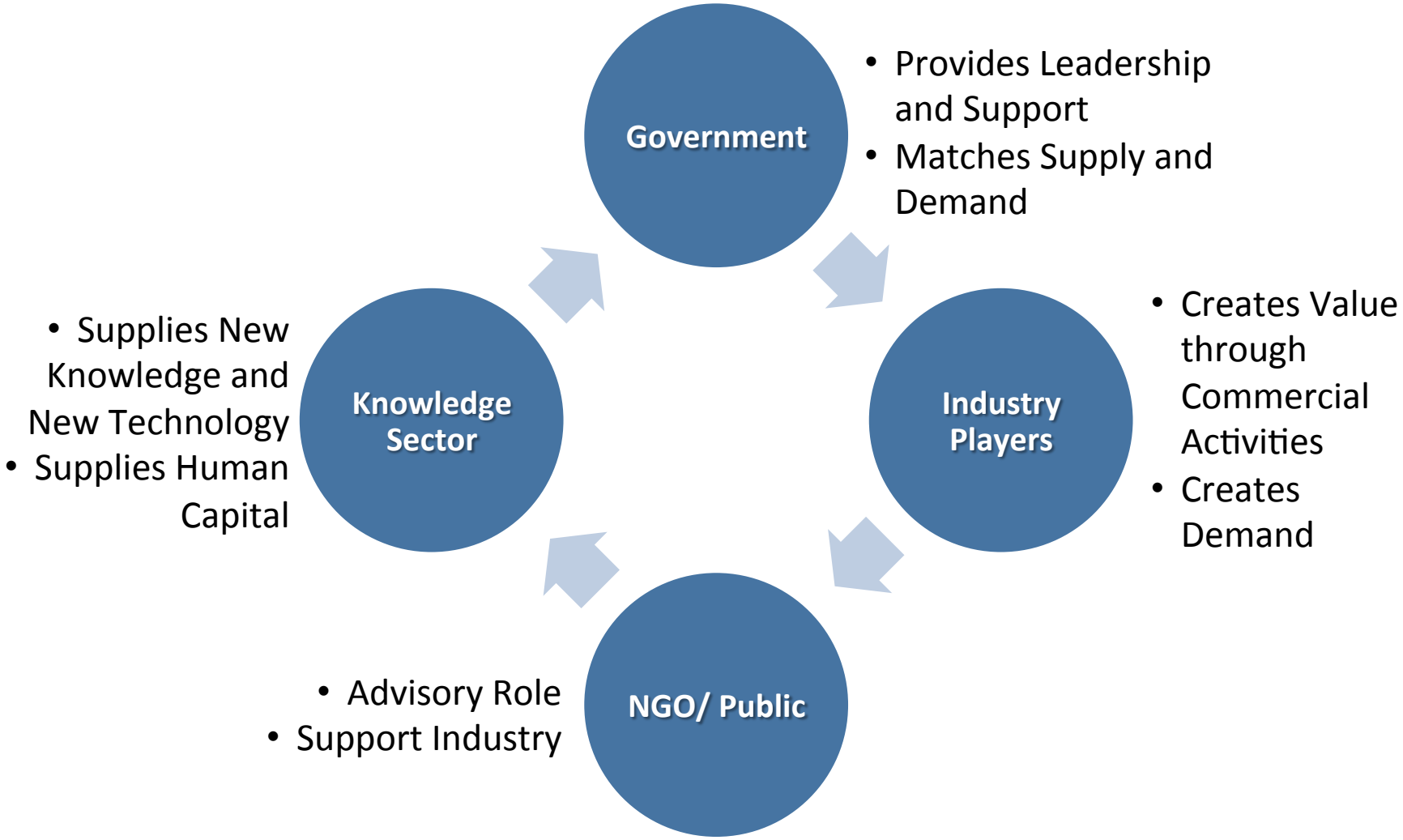
Robotics Malaysia (RM) Project

- To realise a Sustainable and Global Malaysian Robotics Industry
- To build The Quad-Helix: Government, Industry, NGO/Public and Knowledge Sector
- Government to take up Leadership
- **Leading** the **Current Protem** Committee:
  - Government and GLCs (MTDC, Cyberview)
  - Industry (TCMyRO Sdn. Bhd., Siasun(China))
  - NGO (MyRAS)
  - Knowledge Sector (UTM)

Developing a Sustainable and Global Malaysian Robotics Industry

- Sustainable
  - Enough Industry Demand
  - Enough Supply of
    - Vendors
    - Technology
    - Human Capital
  - Growth/Expansion and Profit
- Global
  - Ultimately the Local market is Limited. Therefore the need to Expand
    - Local → Regional → Global

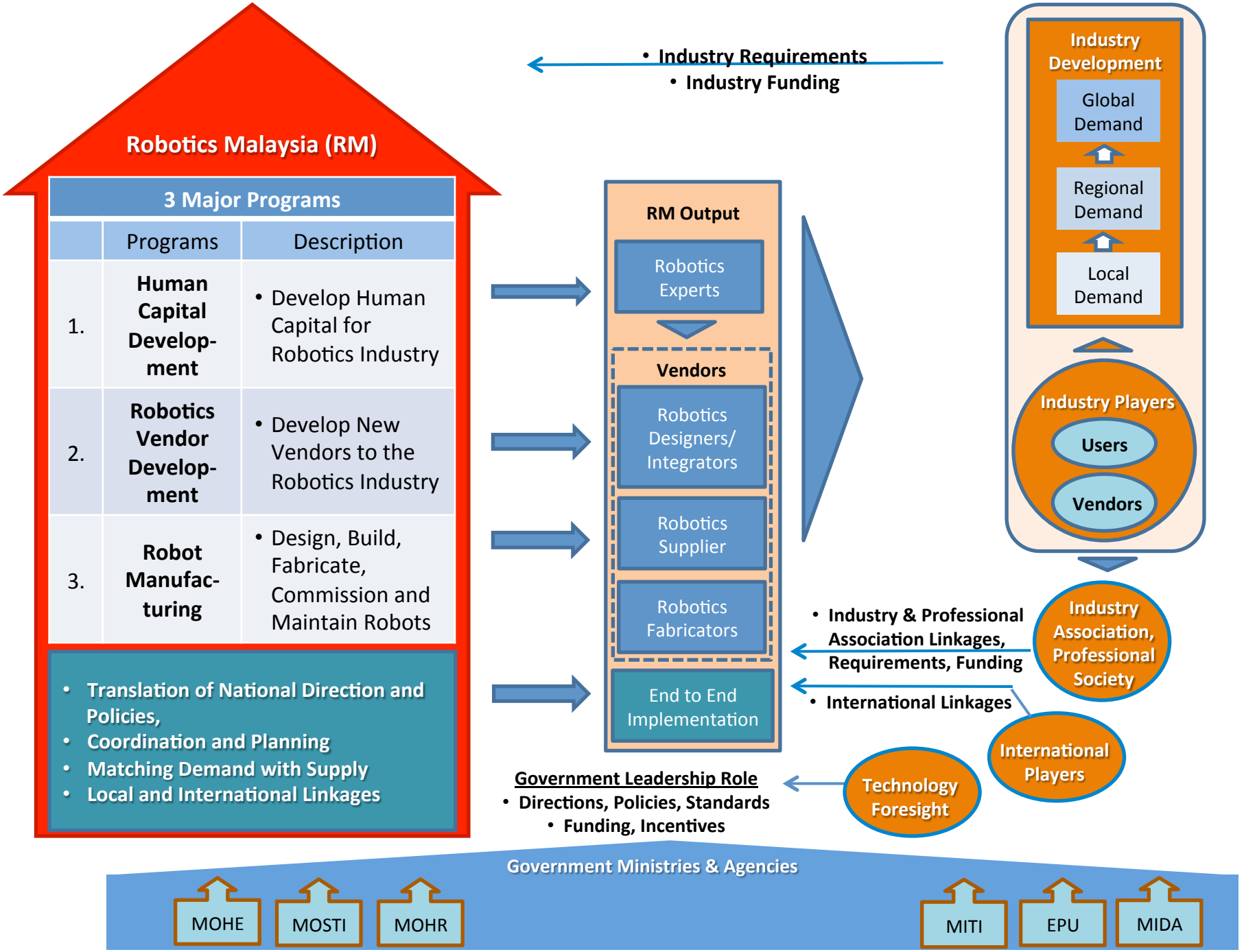
Quad-Helix Model of the Malaysian Robotics Ecosystem



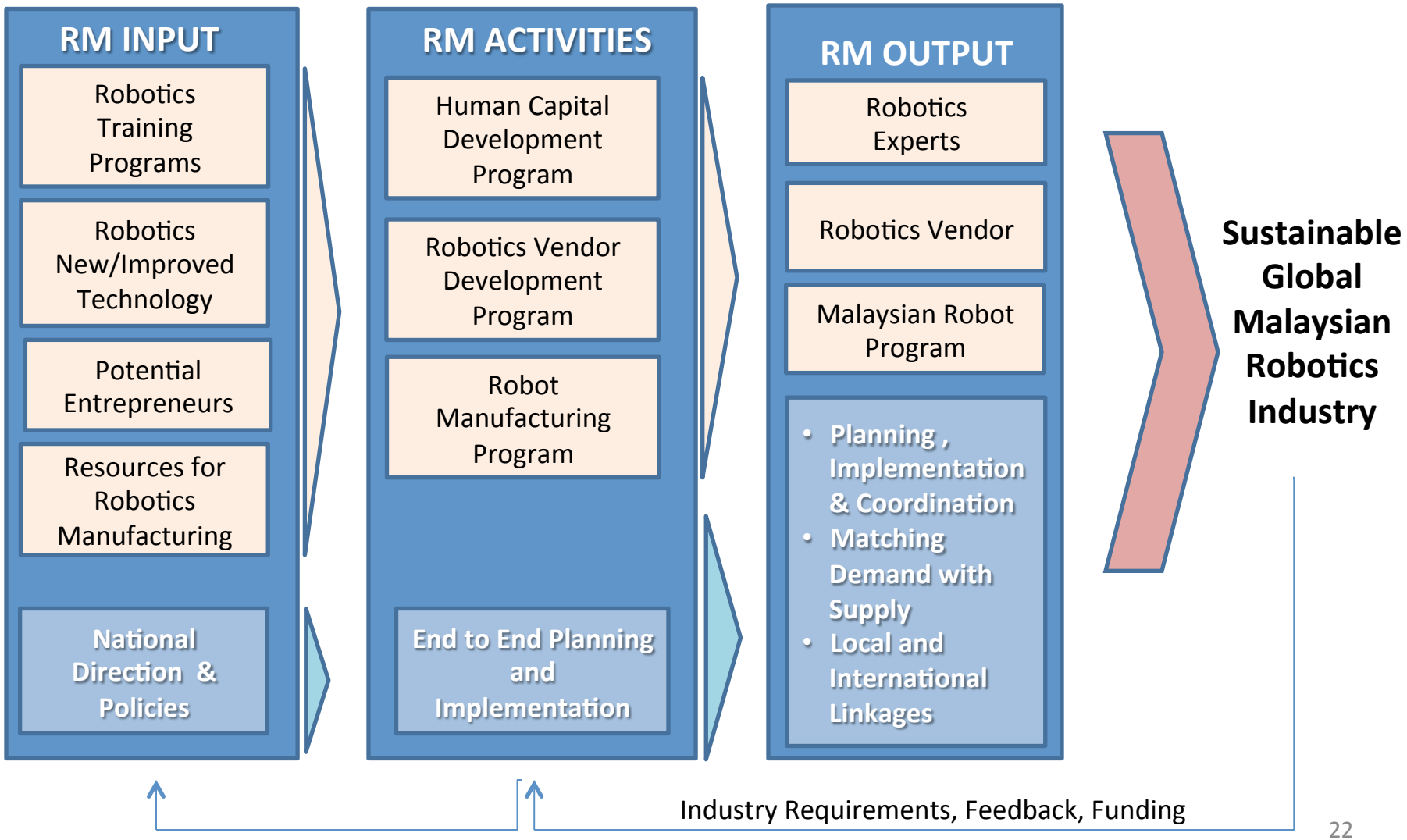
Leadership Role Of the Government

Government has to Play the Crucial Role in Providing:

1. Leadership: Directions and Plans, Establishing the Robotics Innovation Ecosystem
2. Policies: In Support of and to Implement Directions and Plans
3. Support: Incentives, Institutions and Infrastructure


Robotics Malaysia (RM)
3 Major Programs
Programs
Description
1.
Human Capital Develop-ment
• Develop Human Capital for Robotics Industry
2.
Robotics Vendor Develop-ment
• Develop New Vendors to the Robotics Industry
3.
Robot Manufac-turing
• Design, Build, Fabricate, Commission and Maintain Robots
• Translation of National Direction and Policies,
• Coordination and Planning
• Matching Demand with Supply
• Local and International Linkages
• Industry Requirements
• Industry Funding
RM Output
Robotics Experts
Vendors
Robotics Designers/ Integrators
Robotics Supplier
Robotics Fabricators
End to End Implementation
Industry Development
Global Demand
Regional Demand
Local Demand
Industry Players
Users
Vendors
• Industry & Professional Association Linkages, Requirements, Funding
Industry Association, Professional Society
• International Linkages
International Players
Technology Foresight
Government Leadership Role
• Directions, Policies, Standards
• Funding, Incentives
Government Ministries & Agencies
MOHE
MOSTI
MOHR
MITI
EPU
MIDA

Input, Output and Activities of RM

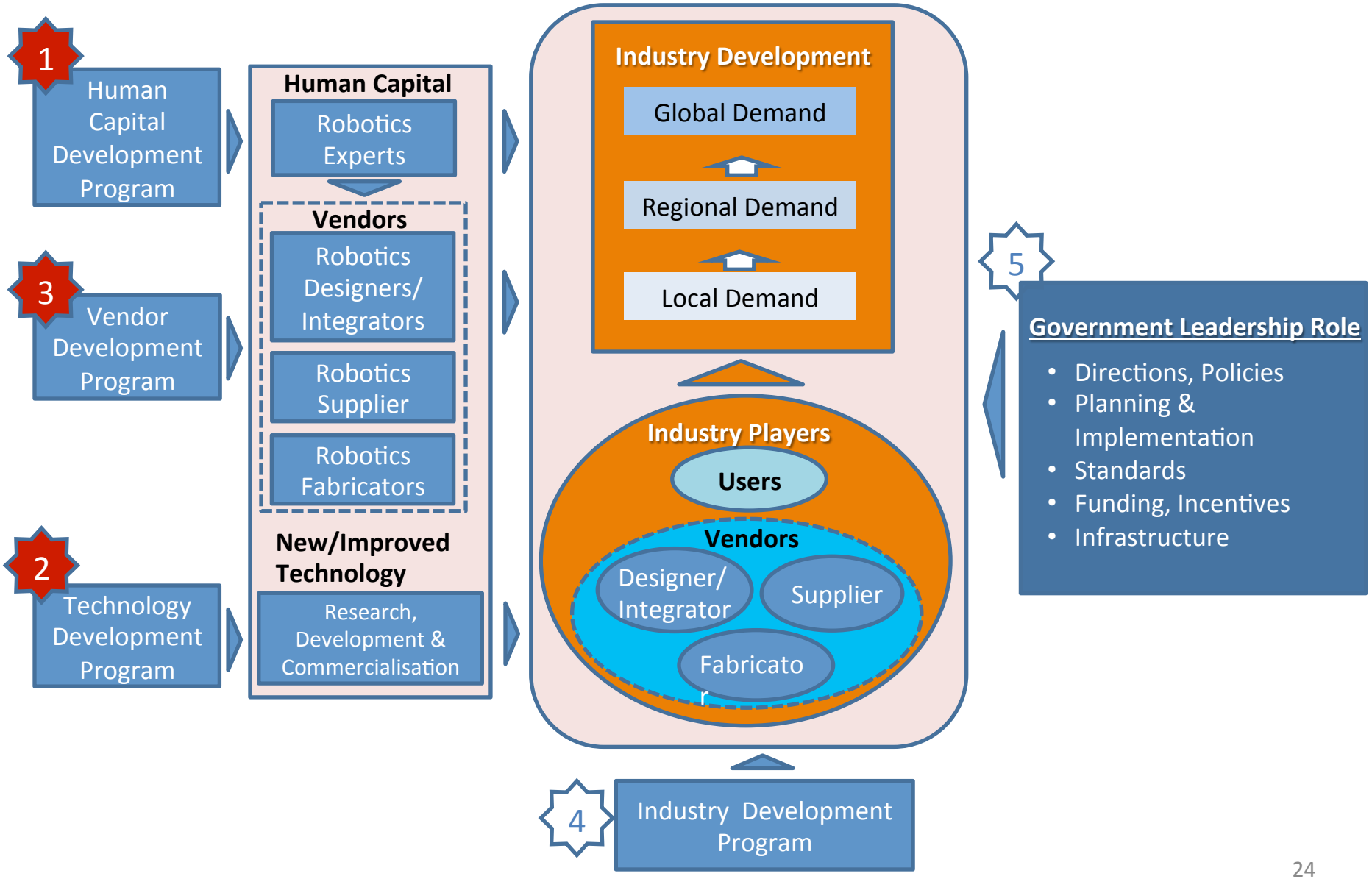


MOHE Contribution: Playing Our Role as the Knowledge Sector in the Quad-Helix

Role of the Knowledge Sector

- Supplies Knowledge and to enable
  - Development of New Technology
  - Upgrade Current Technology
  - Facilitate Technology Transfer
- **Supplies Human Capital For The Robotics Industry**
  - Skilled Workers for Robotics Users
  - Robotics Technopreneurs to fulfill the requirement of the Industry
  - Researchers
  - Innovators

MOHE's Role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Human Capital Development Program
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New/Improved Technology
Research, Development & Commercialisation
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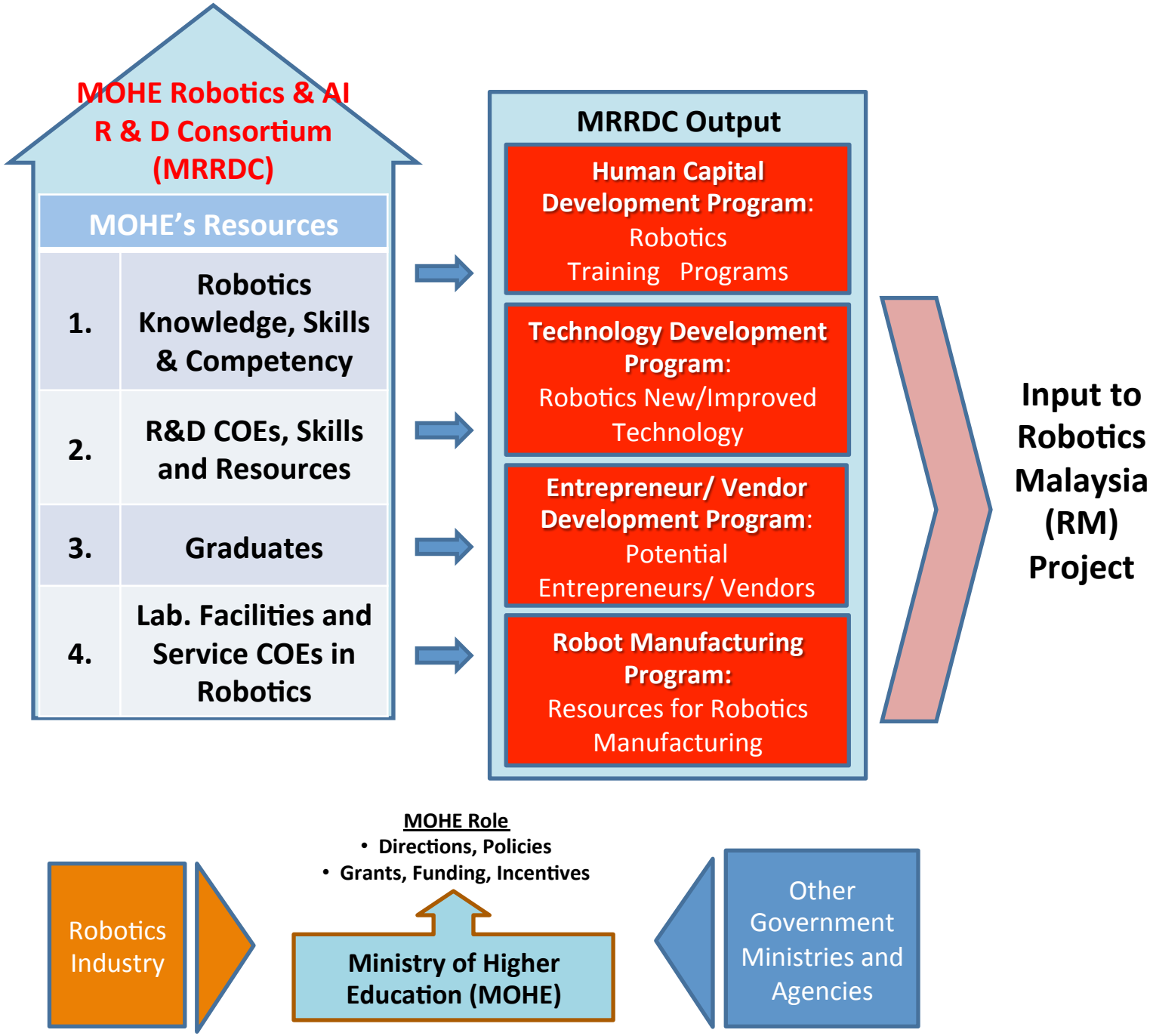
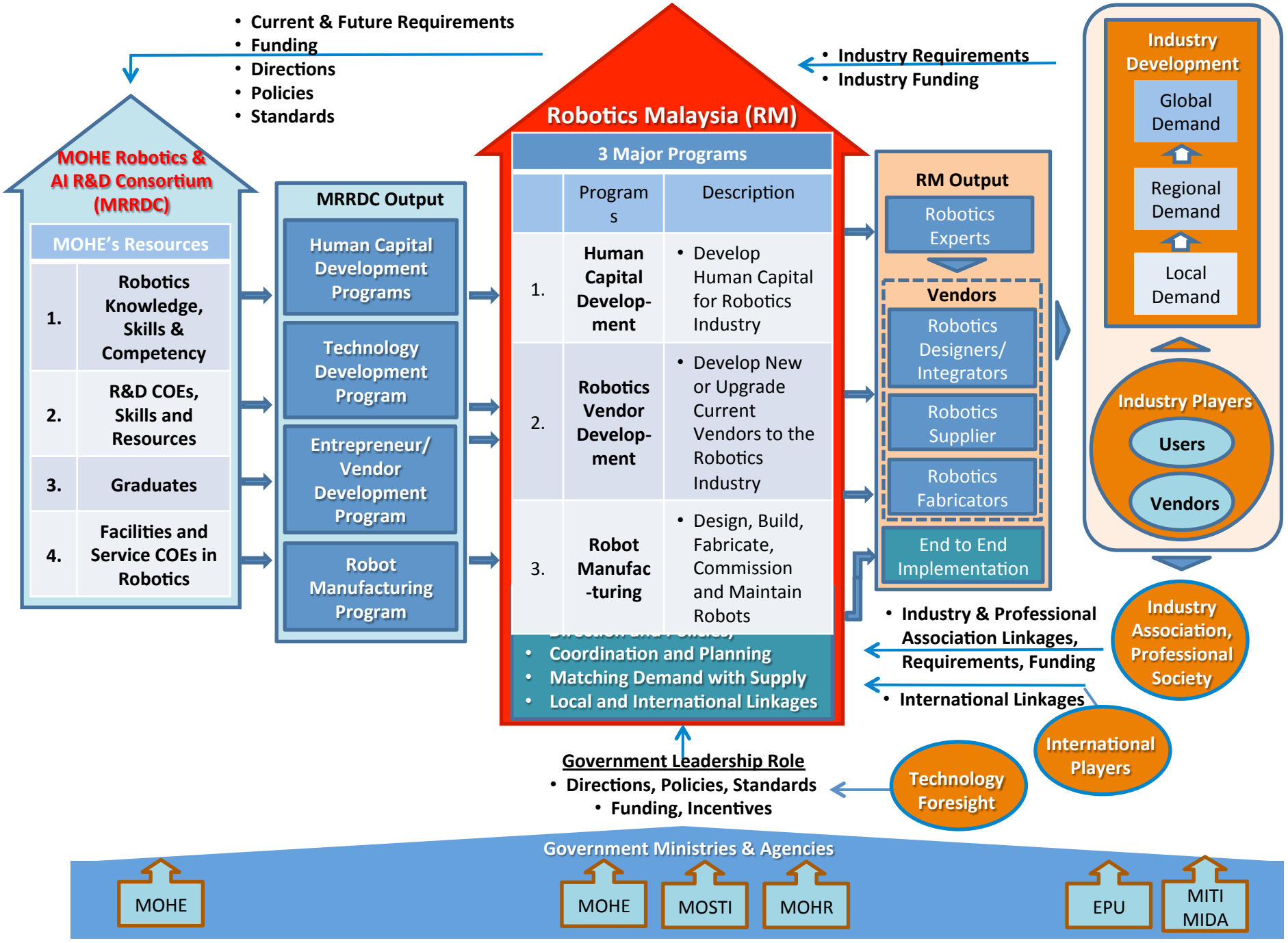
4
Industry Development Program
5
Government Leadership Role
• Directions, Policies
• Planning & Implementation
• Standards
• Funding, Incentives
• Infrastructure


MOHE Robotics & AI R & D Consortium (MRRDC)
MOHE's Resources
1. Robotics Knowledge, Skills & Competency
2. R&D COEs, Skills and Resources
3. Graduates
4. Lab. Facilities and Service COEs in Robotics
MRRDC Output
Human Capital Development Program: Robotics Training Programs
Technology Development Program: Robotics New/Improved Technology
Entrepreneur/ Vendor Development Program: Potential Entrepreneurs/ Vendors
Robot Manufacturing Program: Resources for Robotics Manufacturing
Input to Robotics Malaysia (RM) Project
MOHE Role
• Directions, Policies
• Grants, Funding, Incentives
Robotics Industry
Ministry of Higher Education (MOHE)
Other Government Ministries and Agencies

Linking MRRDC with RM Project

- MRRDC could provide critical input to the National Robotics Malaysia Project
  - Human Capital Development Program
  - Robotics Vendor Development Program
  - Robot Manufacturing Program
- RM in turn will provide MRRDC with
  - Current & Future Requirements
  - Funding
  - Directions, Policies and Standards
- Government Leadership Role in guiding the evolution of the Robotics Industry could be done more efficiently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Agenda

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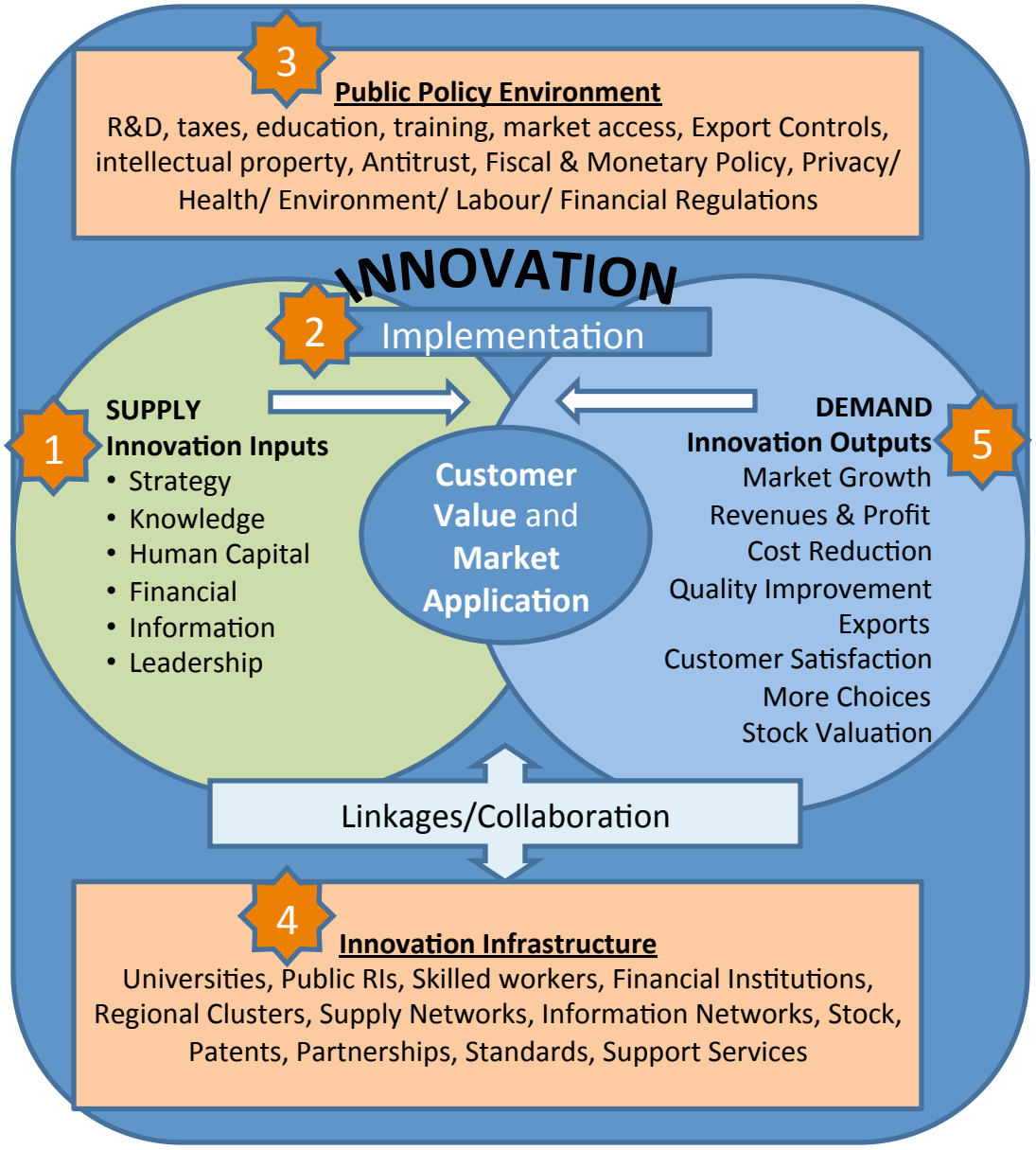
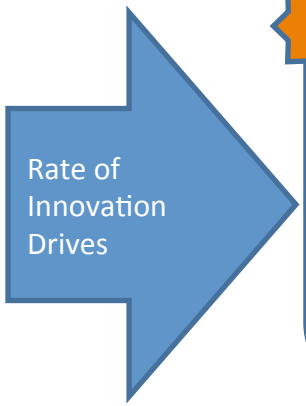
- The Need to Build a Robust Robotics Ecosystem

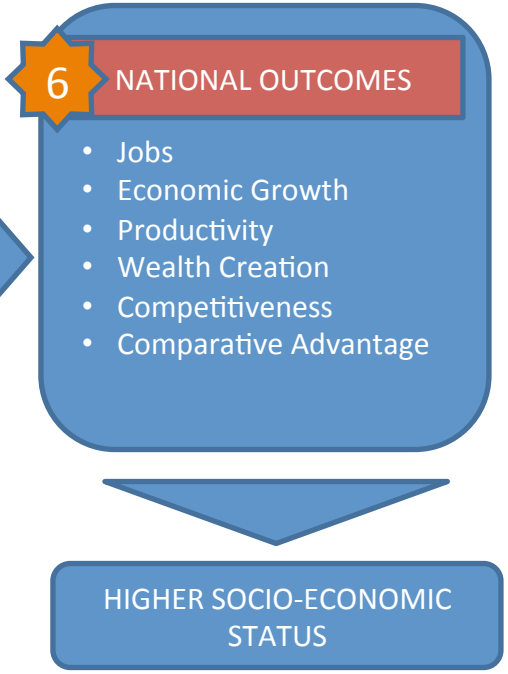
Building a Sustainable Malaysian Robotics Ecosystem

- To Support a Sustainable and Global Robotics Industry, a healthy Ecosystem supporting the Industry must be built.
- The Quad-Helix Model of Innovation:
  1. Government
  2. Industry Players
  3. Knowledge Sector
  4. NGO/Public

A Generic National Innovation Ecosystem





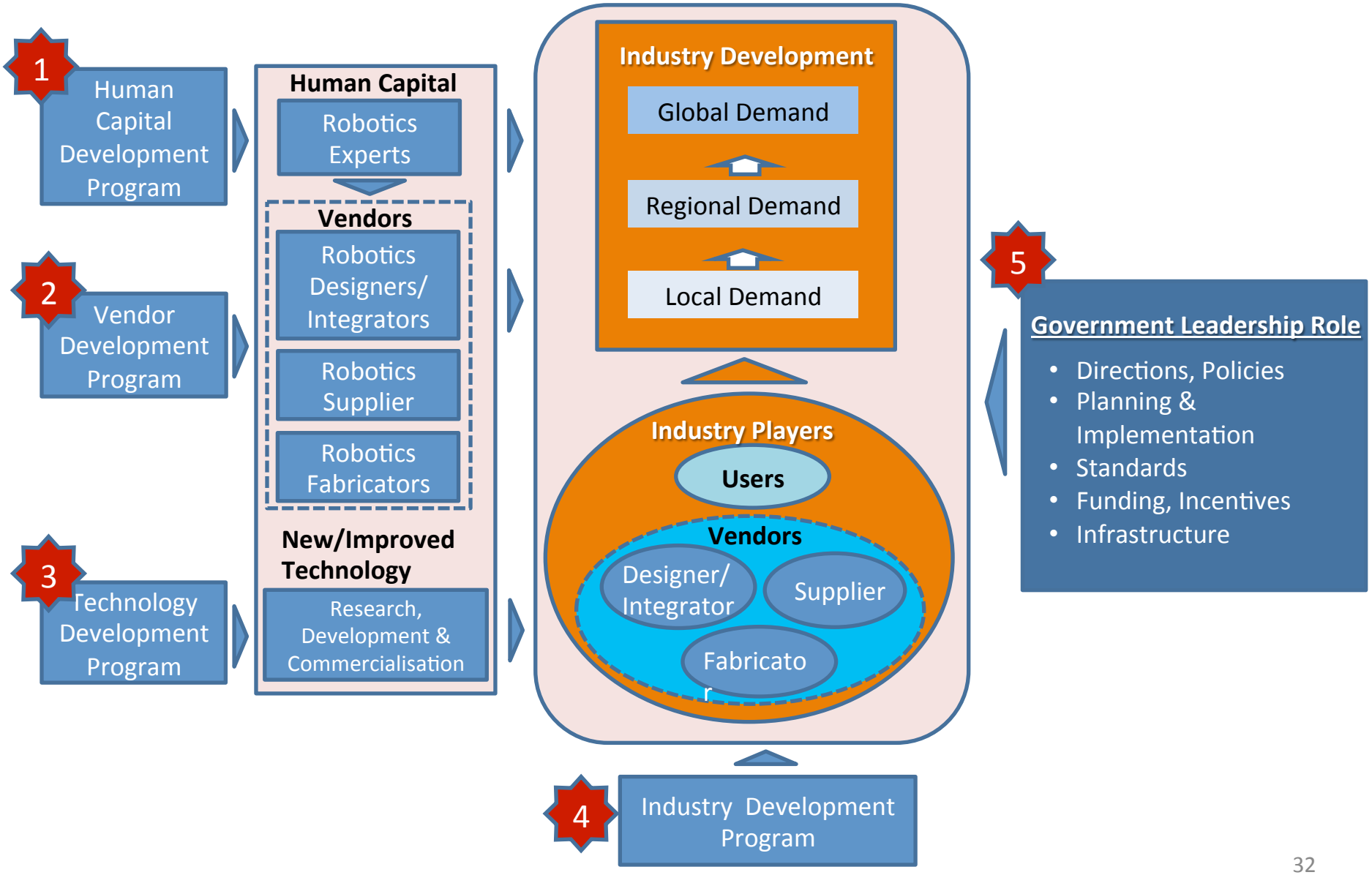


Adapted from:
Egils Milbergs
Center for Accelerating Innovation
www.innovationecosystems.com

Innovation Framework/Ecosystem

- The framework clusters the most important innovation factors into six dimensions:
  1. **Innovation *Input* factors**
     such as enterprise strategy, knowledge, capital and human resources, both domestically and globally.
  2. **Innovation *Implementation* factors**
     such as design, production, organizational culture and barriers to commercialization.
  3. ***Public Policy* environment**
     such as R&D policy, taxes, intellectual property, standards and market access.
  4. **Innovation *Infrastructure* conditions**
     such as quality of research in universities and federal labs, and availability of skilled human resources.
  5. **Consumer value and *Outputs***
     such as market growth, cost reduction, profits, revenues and convenience.
  6. **National Outcomes**
     such as employment, economic growth, competitiveness and trade balance.
- These dimensions, individually and as an ecological system, make up the context in which the nation's enterprises innovate.

Developing a Sustainable and Global Malaysian Robotics Industry



Today's Roundtable Objectives

- To gather UTM's Robotics Experts to Discuss the MRRDC Agenda
- Start a discussion on a UTM's Robotics R&D Agenda to lead MRRDC and in support of the Malaysian Robotics Industry
- To gather and update Information on Robotics Resources in UTM

KEMENTERIAN PENDIDIKAN TINGGI

SOARING UPWARDS
MALAYSIAN HIGHER EDUCATION

Terima Kasih
Thank You