MEMBANGUN EKOSISTEM REKACIPTA DI PERGURUAN TINGGI (Pelajaran dari Malaysia)

IRWANDI JASWIR

(King Faisal International Prize Laureate 2018)

INTERNATIONAL INSTITUTE FOR HALAL RESEARCH AND TRAINING (INHART),
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

- 35 research projects completed
- 200 published papers in indexed journals
- 6 patents; 3 licensed/ commercialised
- 250 papers presented in international conferences (Mostly invited speaker)
- 35 Book Chapters
- 50 Scientific Awards
- H Index 28 (2201 Citations)

Stages of economy in Asia

From resource-driven to Innovation-driven

- Porter M, *Enhancing the microeconomic foundations of prosperity*

About K-economy/New economy

- In the Knowledge-based economy, *knowledge* and *innovation* are the driving force for business and economic development of the country.
- Business and economic development are all about survival and sustainability
- For *survival* we need to continuously have new and innovative products or value-add to existing products
- For *sustainability* we need to have new technologies/enablers that resulted in new innovations.
- For a country to survive in the new economy, it is imperative that R&D and commercialization of R&D products are the national agenda of the country.
- Hence the need to undergo translational research that can create impact to society and industry

Factors that drives Economic Success

The assets that drive economic success of K-based economy:

- ☑ patents
- ☑ advanced research
- ☐ venture capital
- ☑ university graduates and Ph.D.s
- ☐ air, rail and sea hubs

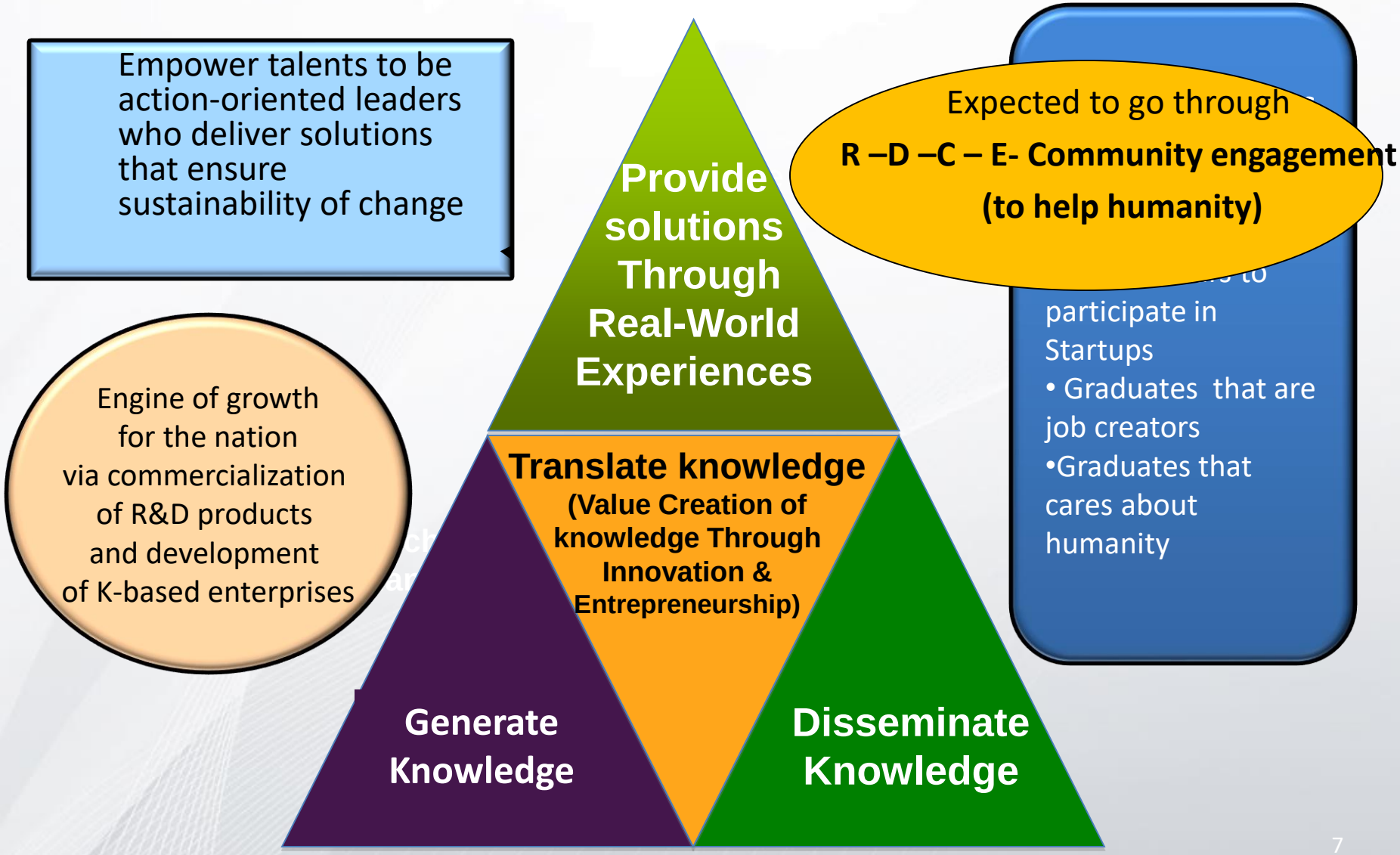
Assets are mainly in the Universities. Should be the test bed of innovation

*Source: Bruce Katz, TIME Magazine, 21st Oct 2010

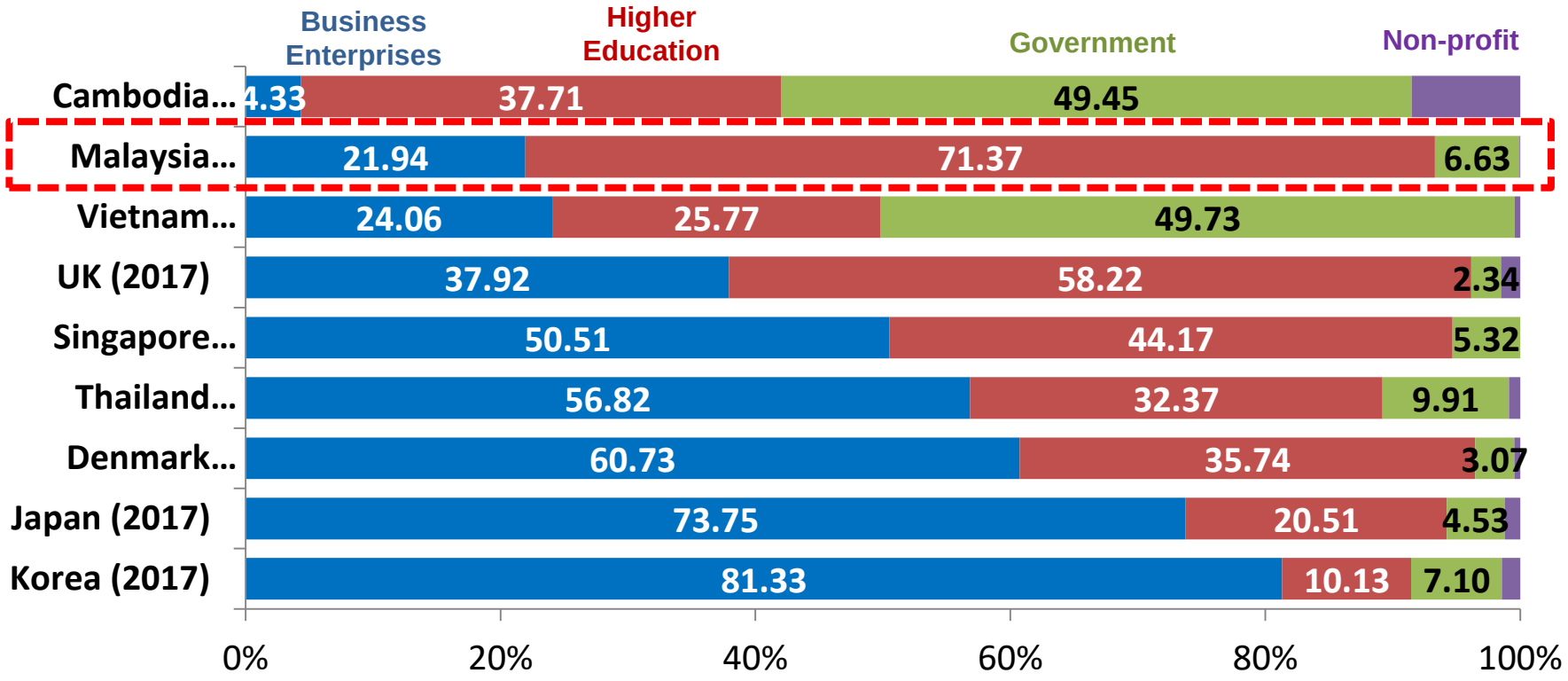
Some Facts…

HDI No 111	Innovation Index No. 85	Low Scientific Productivity
Only 5 Universities in Top 1000	Workforce 8.5 years	Research 0.25% GDP

Role and expectations of Universities in the 21st Century



Malaysia's researchers are mainly in Higher Learning Institutions limiting innovation capability of industry



Percentage of Researchers (in full-time equivalent)

Source: Updated based on Science Outlook 2017 (ASM, 2019) , data source : UNESCO Institute of Statistics Database accessed in October 2019, MASTIC National R&D Survey 2018

Innovation ecosystem is an important agenda to top management

- Leadership in university must have the innovation ecosystem in place
- Technology transfer office or innovation office with lawyers
- Corporate arm of University for licencing and commercialization deals

Does the university has its own comprehensive IP policy that drives innovation for staff and students?

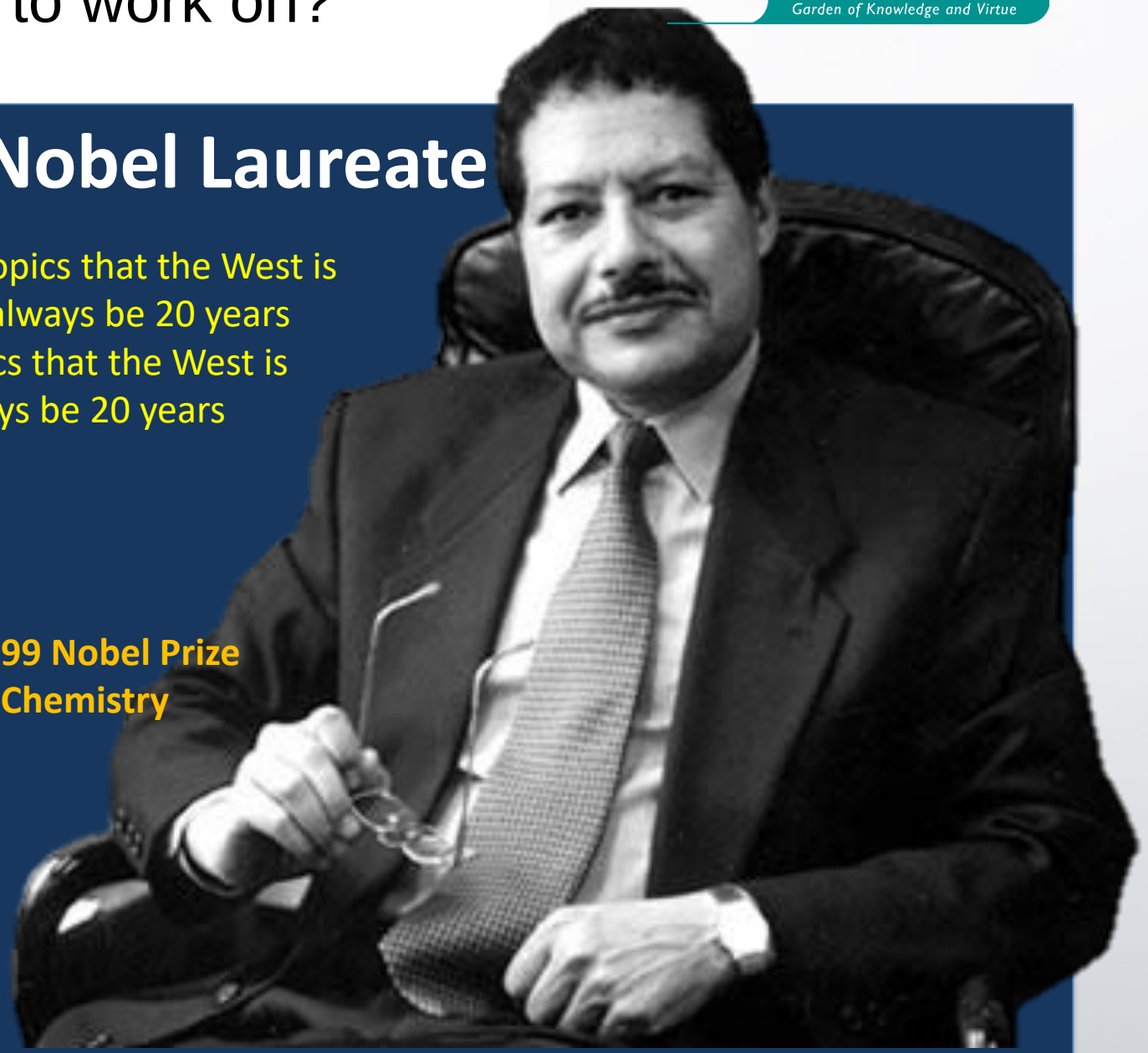
Which topic to work on?

Advise from a Nobel Laureate

"If we work on research topics that the West is not interested in, we will always be 20 years ahead. If we work on topics that the West is interested in, we will always be 20 years behind".
..... Ahmad Zewail

Blue ocean strategy

1999 Nobel Prize in Chemistry



Gap between Socio-economic Goals & R&D Priorities

Source: Analysed by ASM (ASM, 2020)

10 Science & Technology Drivers

5G/6G

Next-generation mobile networks that enable higher frequencies, capacity and lower latency.

Sensor Technology

High-performance sensors, including microelectromechanical systems (MEMS), magnetic materials and piezoceramics, wearable biosensors and printable wearable electrochemical sensors.

4/5D-Printing

Printing materials using smart materials that change its form according to the environmental changes or respond to a stimulus and print parts as simultaneous multilayer curved layers, making the objects stronger and cost competitive than 3D printing.

Advanced Materials

New, stronger, durable and efficient heat and energy conducting materials that have wide industrial, biological and medical applications

Advanced Intelligence Systems

Machines, computer systems and virtual reality technology that mimic the human experience and intelligence processes, which include the use of visual machine systems, speech recognition, expert systems and swarm technology.

Cyber-Security & Encryption

Technologies, processes, practices and methods that protect the information and communication systems (networks, devices and data),mitigating risks associated with malicious attack, digital hijacking, unauthorized access and damage to the systems and data.

Augmented Analytics & Data Discovery

Advanced data discovery methods that enables users to gain insights into patterns of the data generate using various statistical, pattern recognition, machine learning, natural learning and other advanced data analysis tools.

Blockchain

Digital ledger system that is democratic, incorruptible, efficient, verifiable and holds permanent record of every transaction of value among multiple economic agents.

Neuro Technology

Technology that enables the study the brain processes, decision-making processes and disorders. It also entails studying ways to modify behaviour and treat neurological disorders.

Bioscience Technology

Bioscience technology uses living processes, organisms or systems to manufacture products or technology which overlaps with molecular biology, bionics, bioengineering, genetic engineering and nanotechnology.

10 Socio-economic Drivers

Energy

An important driver of industrial growth, the energy sector has a complex and inter-related network of entities involved in the production, and distribution of energy to fuel the economy and facilitate the means of production as well as transportation. Sources of energy can be classified as non-renewable and renewable.

Business Financial Services

Business Financial Services encompass services that support business function such as Information Communication Technologies (ICT), logistics, customer service as well as financial services rendered by banks, investment houses, lenders, finance companies, real estate brokers, and insurance companies.

Culture, Arts and Tourism

Culture encompasses language, religion, cuisine, social habits, music and arts of a group of people. Art is a diverse range of activities, expression, or application through creative visual, auditory, and artworks. Tourism is a product of modern social arrangements in pursuit of recreation, relaxation and pleasure while making commercial provision of services.

Medical and Healthcare

Medical and healthcare encompass all goods, services and payment mechanisms for prevention, restoration, cure, maintenance of one's physical, mental or emotional well-being by health practitioners through services, prescription and devices. The sector is also intertwined with medical and health products manufacturing.

Smart Technology and Systems (Next-Generation Engineering & Manufacturing)

Next-generation Engineering & Manufacturing systems are able to sense the situations and preempt solutions through adaptive data-driven decisions and cognitive intelligence. Smart technology and systems will create a resilient utilization of resources through self-monitoring, self-diagnosing and self-optimizing in the production and supply chain from cradle to grave.

Smart Cities & Transportation

Integration of physical, digital, advanced technologies, interconnected information, and human systems in a built environment to deliver sustainable, resilient, prosperous and inclusive future for its citizens.

Water and Food

Water and food connections lie at the heart of sustainable, economic and environmental development and protection. The unbroken links between these sectors demand well-integrated plans to protect water and food security in order to meet the demand of rising population, urbanisation, climate change and economic dynamics.

Agriculture and Forestry

The overall agriculture sector is broad, encompassing industrial crops such as oil palm and rubber, food and cash crops or agro-foods, such as paddy and livestock, and specialty products, fisheries and forestry.

Education

Education system spans across group of institutions (ministry of education, schools, universities and technical training institutions etc.) from pre-school to tertiary level whose purposes include facilitating learning, acquisition of knowledge and skills, and conducting impactful research.

Environment & Biodiversity

Reservation and conservation of the environment and biodiversity covering terrestrial and marine ecosystems, including the utilisation of natural resources is vital to ensure sustainability and climate change resilience while ensuring sustainable development.

8i Innovation helix model for Ecosystem Analysis

Infrastructure

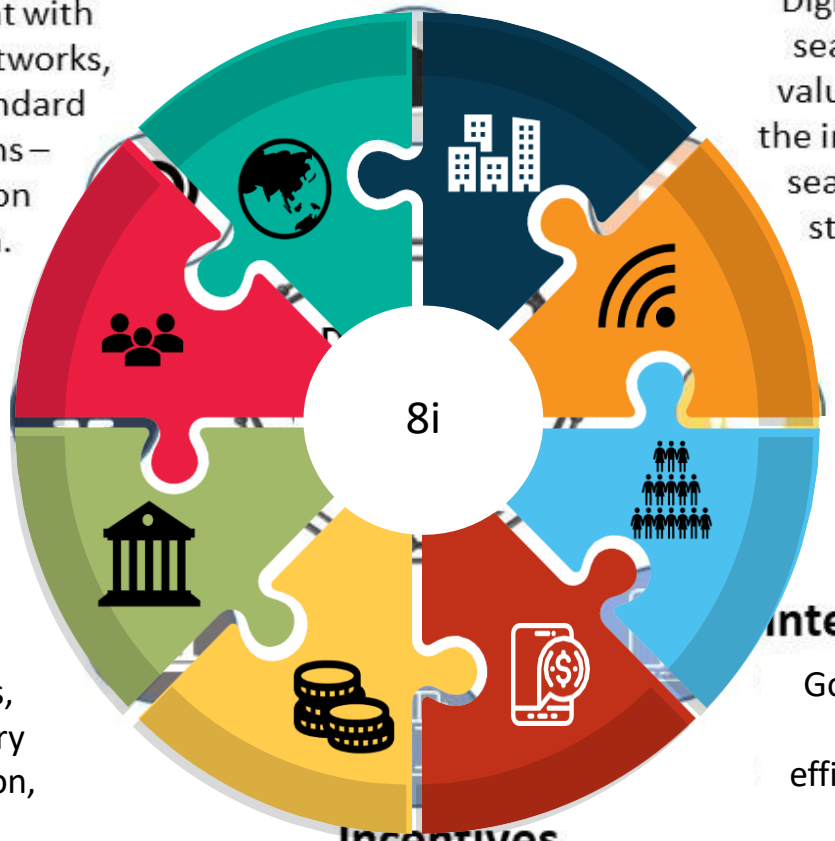
Quality and sophistication of the technological infrastructure that support the growth and development of the industry

Internationalisation

Depth and breadth of engagement with global knowledge & innovation networks, institutions of governance & standard boards and global supply chains – expansion of global innovation footprints and market reach.

Infostructure

Digital infrastructure that provide seamless integration of multiple value chains within and across the the industry - these systems provide seamless flow of information for strategic decision-making and market intelligence.



Interaction

Lead and quality of cooperation, collaboration and knowledge sharing among all stakeholders.

Intellectual Capital

Talent stock – this covers general, specialized, technical, entrepreneurial and leadership skills.

Institutions

Quality of the institutions of governance (government agencies, regulatory, standard bodies, Industry associations, community organization, institutions of learning/research institutes) that support systematic development.

Integrity Systems

Governance systems to manage the efficiency of processes and ensure commitment to comply with global standards.

Incentives

Fiscal and non-fiscal incentives to encourage R&D, the adoption of new technology, innovation, commercialization of local technology, and market expansion strategy, Including globalization of local technology.

Collaborative Platform

Aim: Integrated solutions through quadruple helix collaborative networks

Capacity Building

Connectors

Market Access

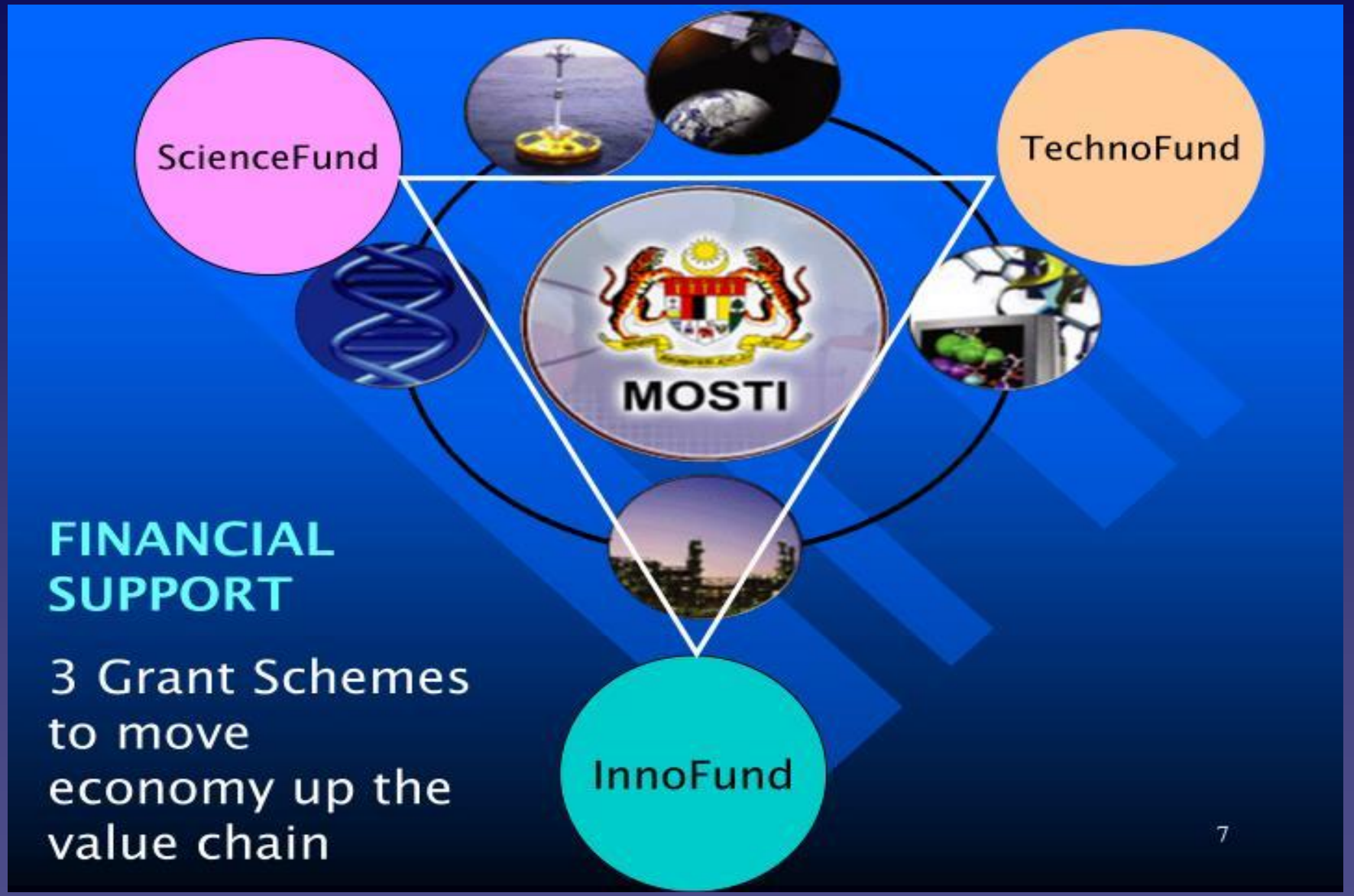
Producers & Manufacturers

Supply Chain & Logistics
(Technology and Innovation Sandbox)

Technology Providers

Standards & Regulations

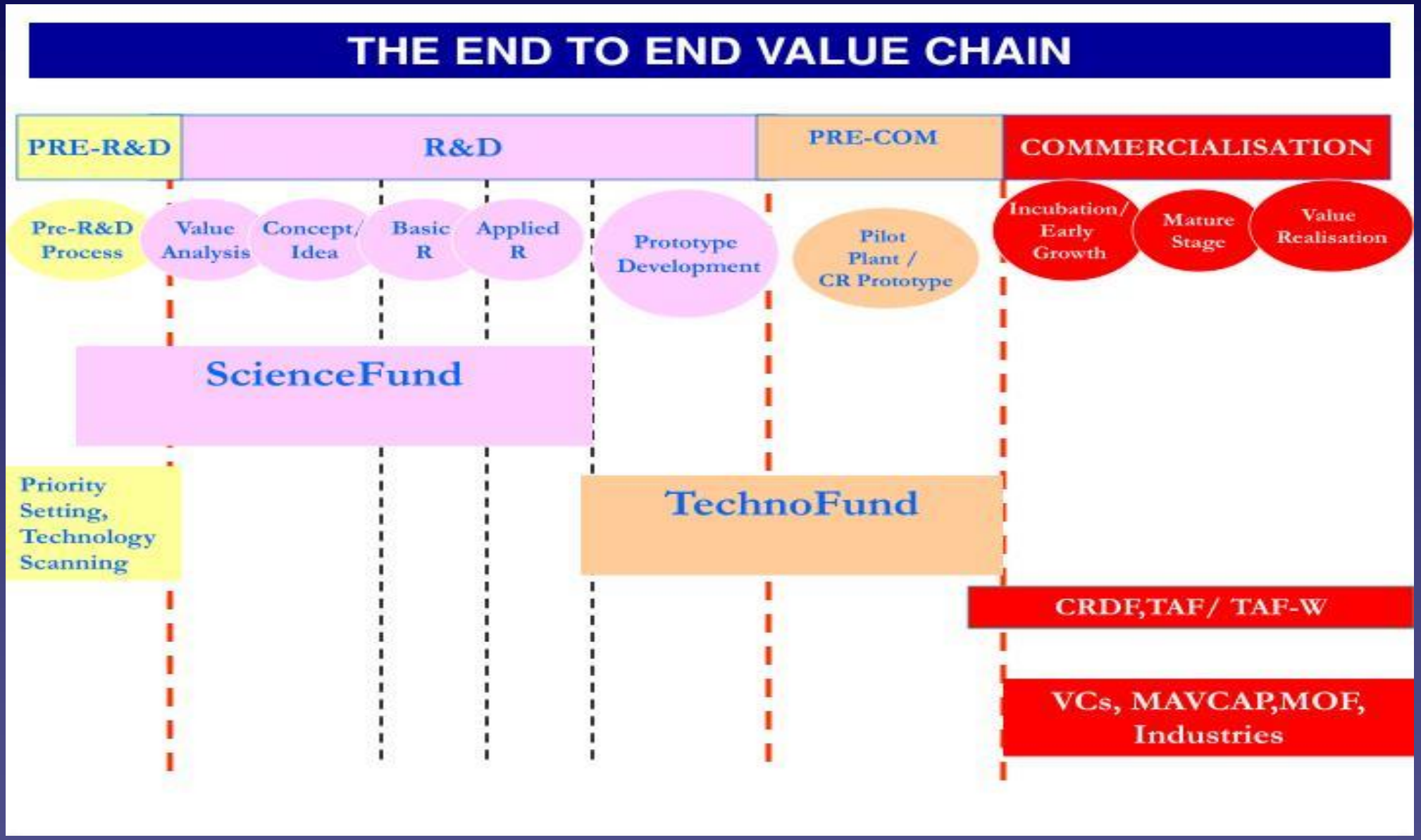
Financing Providers



FINANCIAL SUPPORT

3 Grant Schemes to move economy up the value chain

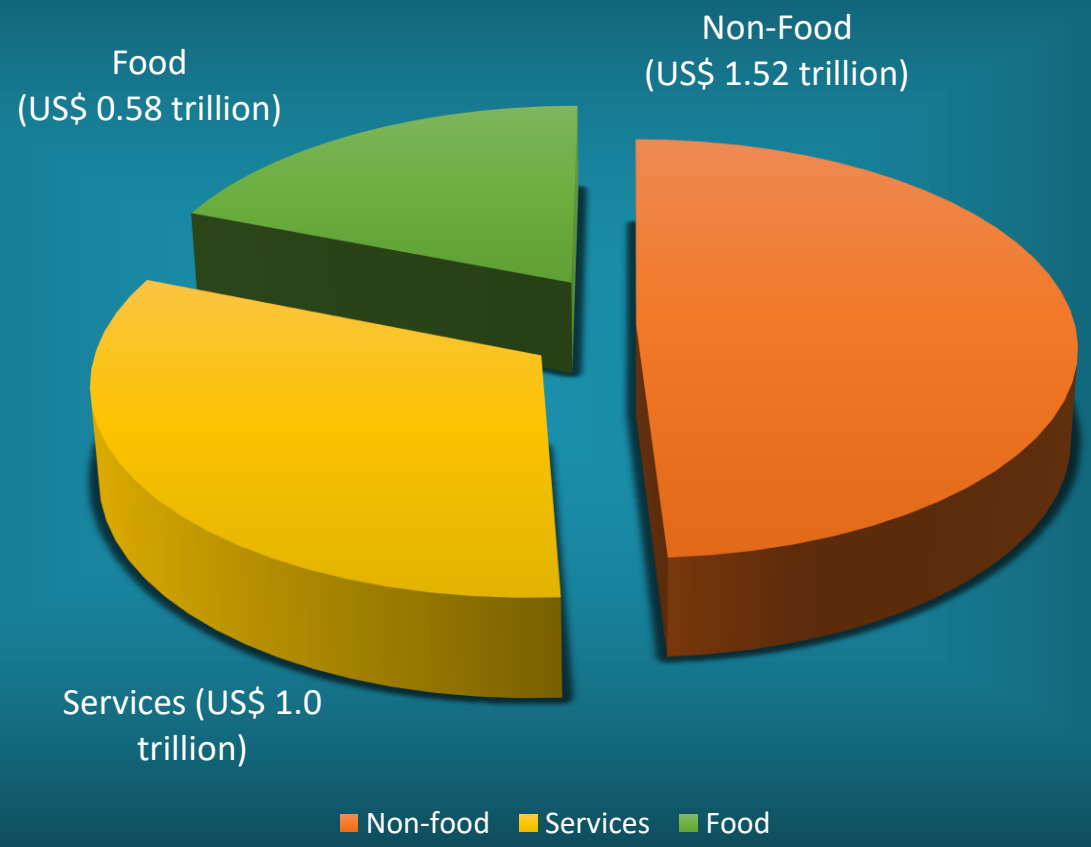
THE END TO END VALUE CHAIN



OTHER SOURCES

- Kementrian Pendidikan (FRGS, PRGS, TRGS, Knowledge Transfer Programme (KTP), etc)
- National Innovation Agency (Under PM Office)
- Cradle Fund

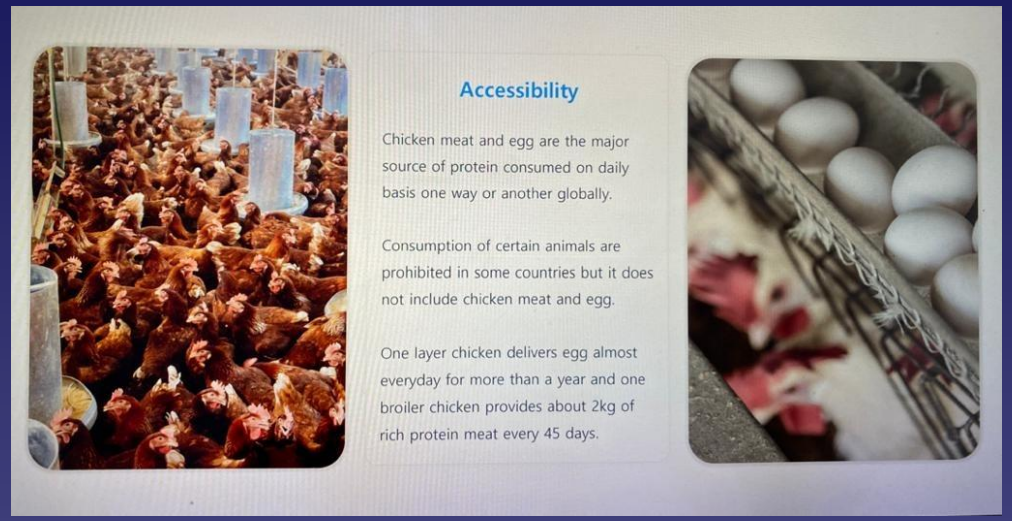
Global Halal Market 2017 ~ US$3.1 trillion/year

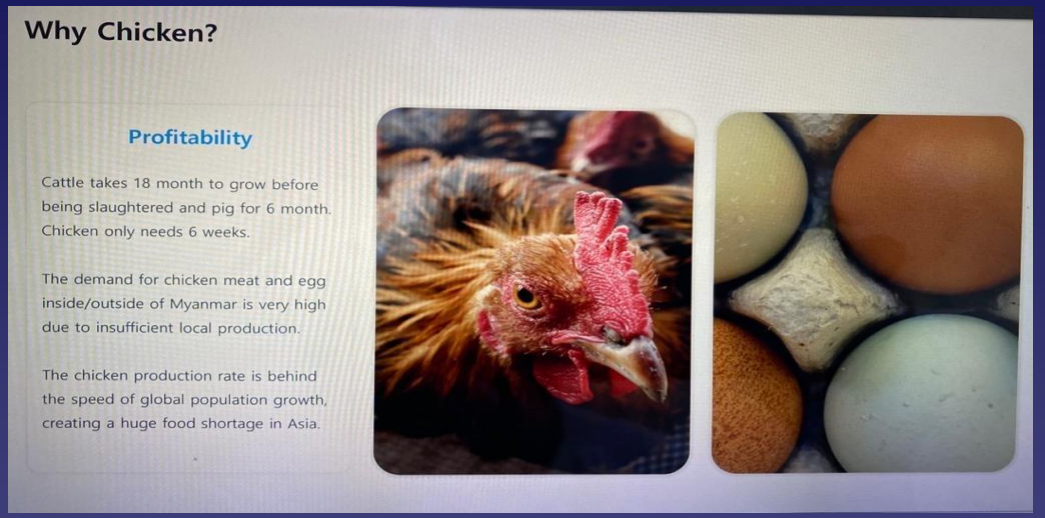


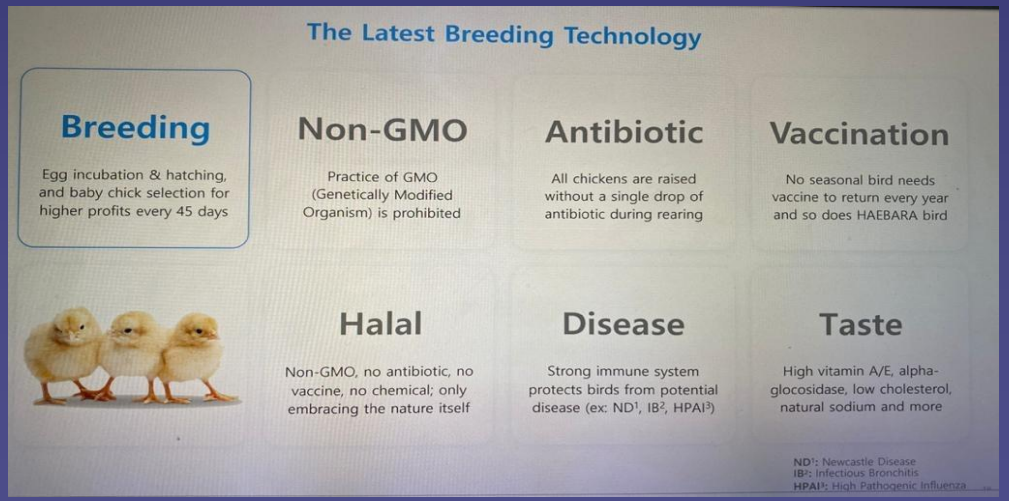
Source : Fourth Industrial Master Plan (IMP4)

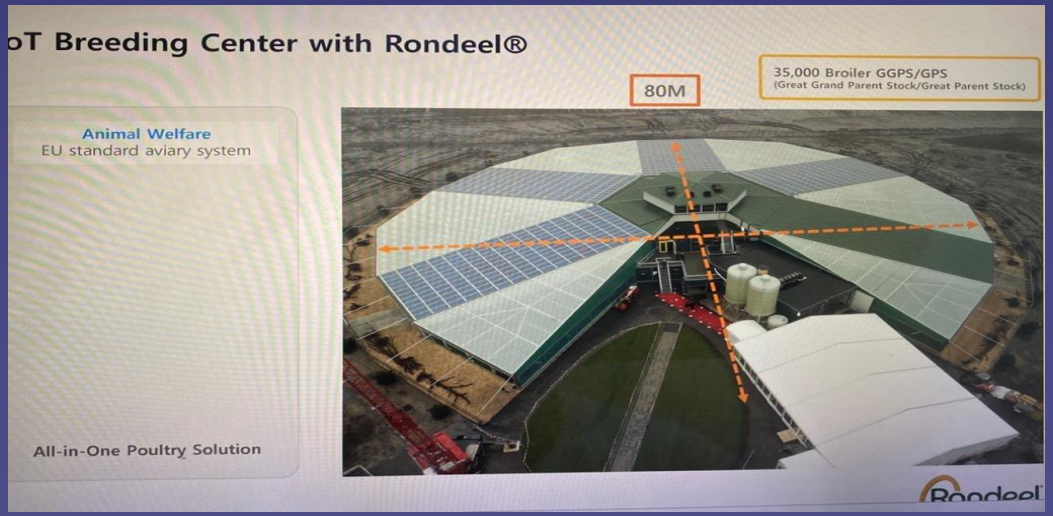
BEBERAPA CONTOH KOMERSIALISASI PATEN (PROF DR IRWANDI JASWIR)

Haebara Chicken Project
(Korea, Singapore, Myanmar, Malaysia n Indonesia)









BROMME
CREAM CHEESE

Perfect for Baking!

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HALAL

SUITABLE FOR VEGETARIANS

International Food Research Journal 24(Suppl): S529-532 (December 2017)
Journal homepage: http://www.ifrj.upm.edu.my

Rapid detection of ethanol in beverages using IIUM-fabricated electronic nose

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Article history

Received: 7 March 2017
Received in revised form: 19 September 2017
Accepted: 26 September 2017

Keywords

E-Nose
Ethanol
Response surface methodology

Abstract

This study has been successfully conducted to develop a method for rapid detection of ethanol (EtOH) concentration in beverages using Portable Electronic Nose (E-Nose) developed by International Islamic University Malaysia (IIUM). E-Nose is widely used in food analysis. However, E-Noses used in the food industry are big and not portable. The very recently developed portable device used in this study is very handy and practical for use. Results from this study revealed that the device could be used for rapid detection of ethanol concentration in various beverages such as alcoholic beverages, isotonic drinks, soft drinks and fruit juices from different brands sold in Malaysia. From the result obtained, it was shown that the device has high accuracy and reliability where it could detect ethanol concentration as low as 0.1% (v/v). The analytical condition for the detection was achieved with the lowest voltage output of 0.43V. While for optimization analysis using Response Surface Methodology (RSM), optimum Headspace Generated Time (HGT) and bottle's volume (mL) obtained are 0.66h and 100 mL, respectively.

Introduction

An E-Nose is a device that imitates the principle of human's olfactory mechanism for vapor detection of any volatile compound (Wilson and Baietto, 2009; Raj *et al*., 2012). E-Nose is an important device used in the Food Industry and can give many benefits to the consumers. Numerous studies have been done to analyze the characteristics and quality of beverages such as dairy products (Labreche *et al*., 2005; Raj *et al*., 2012) soft drink (Concina *et al*., 2010), fruit juices (Gobbi *et al*., 2010), instant coffee (Pornpanomchai *et al*., 2010) and the most common research conducted are for alcoholic beverages (Lozano, 2006; Garcia-Martinez *et al*., 2011).

The differences between this project with other existing researched are that the E-Nose developed for the detection of EtOH in this study is the first of its kinds and it was used to detect EtOH content in beverages of different brands sold in Malaysia. Apart from that, the process parameters were optimized using RSM from the Design Expert 6.0 software.

This research is important for the consumer since the IIUM fabricated E-Nose was designed as a portable one that people can bring the device along and test for the EtOH content in their beverages. Moreover, a fully portable device for volatile compounds detection with very sensitive sensors and on-line analysis tools is needed in the market (Özmen and Doğan, 2009). The significance of this research is to calibrate the newly developed portable E-Nose and validate as well as screen the beverages for the presence of EtOH content. One of the major problems in Malaysia's market is that there might be some products consist of EtOH content without being mentioned on the product's label (Azah *et al*., 2008). Apart from that, the objective of this research is to optimize the condition parameters, for how low does the EtOH concentration can be detected by the E-Nose. These voltage outputs will be saved in a database and later analyzed using Design Expert software.

For a clearer overview about the portable E-Nose, it can be summarized by showing its architecture

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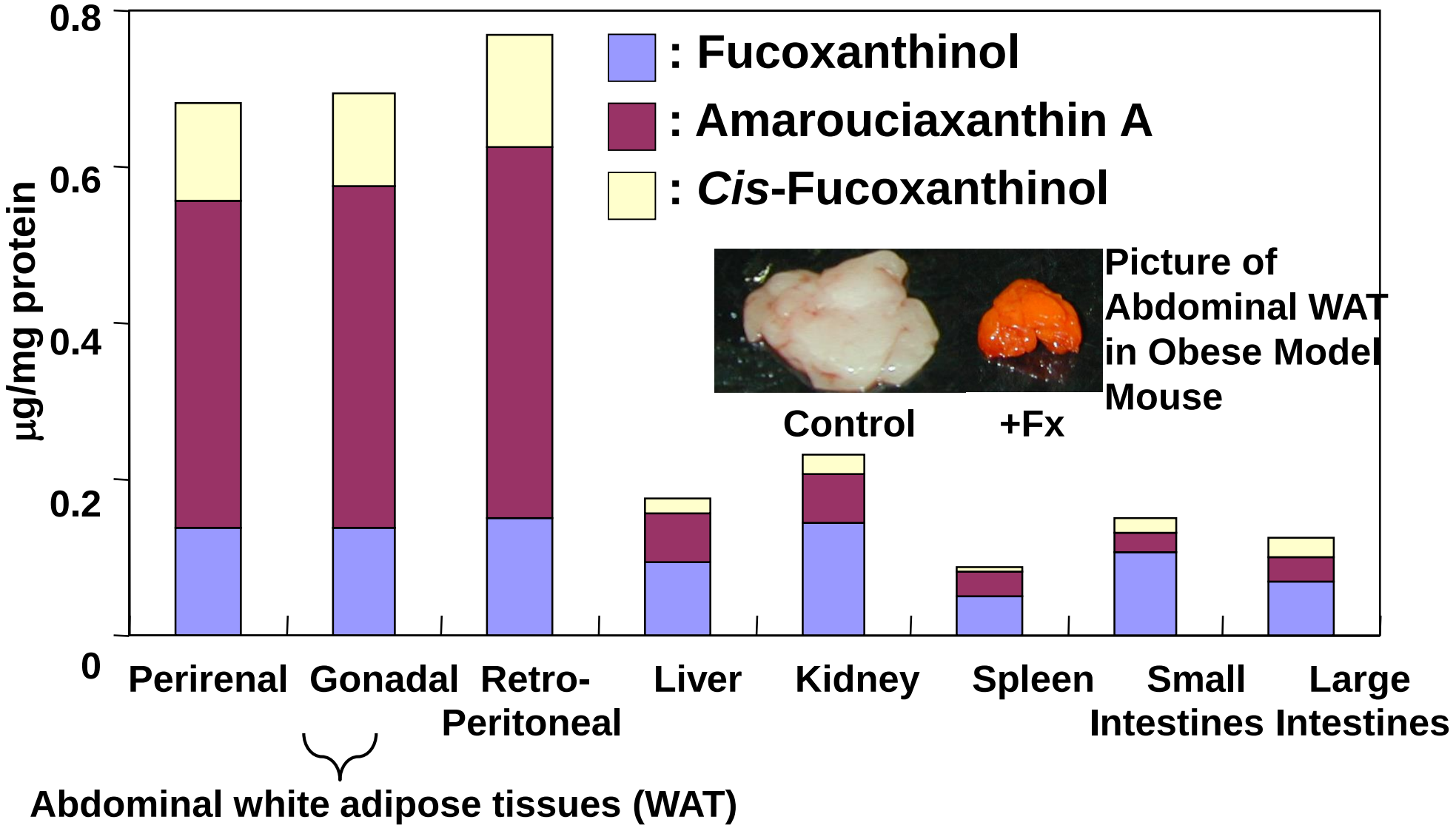
A
B
C
D
E



Concentration of Metabolic Products in Mouse Fed Fucoxanthin (FX) (0.1%) for 4 Weeks.

***A considerable amount of fucoxanthinol was also found in plasma as a main metabolite.**


skin beneath,
helps unclog pores a
reduces acne breakou
Seaweed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Enriched Fucoxanthin
Seaweed soap cleans the body as traditional soaps do, plus it exfoliates the skin. Gritty bits of seaweed within the soap remove dead cells on the skin. This reveals the newer skin beneath, helps unclog pores and reduces acne breakouts.
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Bandar Sri Damansara,
52200 Kuala Lumpur, Malaysia.
Tel : +603-6273 1333

Habibie Award 2013 (Medicine and Biotechnology)

PIG & ITS DERIVATIVES

- FAT (Lard)
- SKIN
- INNARDS
- MEAT
- HAIR
- BLOOD
- BONE
- FAT DERIVATIVES
- BROTH
- SHORTENING
- TEXTURIZER
- GELATINE
- COLLAGEN
- ENZYME
- ACTIVATED CARBON
- FERMENTATION MEDIA
- CYSTEINE
- EMULSIFIER
- MARGARINE
- CREAMER
- ICE CREAM
- MONO & DIGLYCERIDA
- GLYCERINE
- TOOTH PASTE
- CREAM
- SEASONING
- SOUP
- FLAVOR
- BAKERY BISCUIT
- MARSHMALLOW
- SOFT CANDY
- YOGHURT
- ICE CREAM
- CAPSULES
- JELLY
- COSMETIC
- SAUSAGE CASSING
- LEATHER
- INTESTINE
- PANCREAS
- INSULIN
- RENNET
- CHEESE
- SAUSAGE
- MEDICINE
- SOAP
- LIPSTICK
- COMETIC
- FLAVOR & SEASONING
- POWDER
- PORK
- BACON
- MEAT FLESH
- PASTA
- BURGER
- BREAD IMPROVER FLAVOR
- TOOTH BRUSH
- BRUSH
- REFINED OIL & WATER
- MICROBIAL PRODUCTS

TO BE DISPLAYED IF PERMITTED

Prepared by

ALL CEYLON JAMIYYATHUL ULAMA

HALAAL CERTIFICATION COMMITTEE

Past and Current Research on Gelatin

- Gelatin from local goat for pharmaceutical capsules (in Indonesia)
- Fish gelatin (30 species)
- Production of fish gelatin nano-particles
- Encapsulation of bioactive peptide using gelatin nano-particles
- Production of plant-based gelatin replacers
- Development of portable device for rapid authentication of non halal gelatin
- Determination of gelatins in dental materials
- Camel gelatin project (with KSU)
- Seaweeds projects

Camel Gelatin Project

Pilot Plant of Gelatin and Derivatives

THE OUTCOME - HYGIENIC ENVIRONMENT

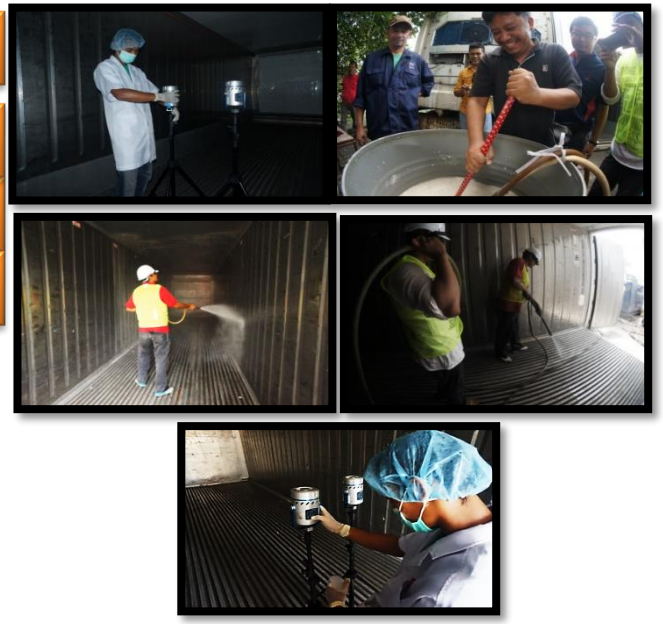
HALAL ASSURANCE SYSTEM
HPP
Halal Purification Practice
مالیزیا
CERTIFIED

7x WASH

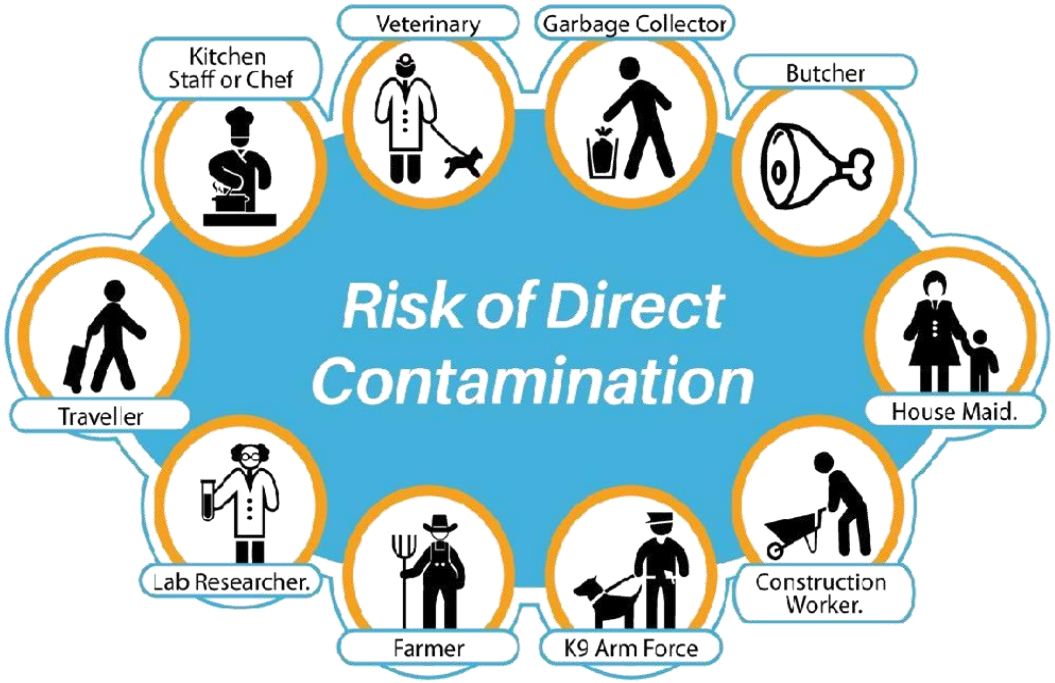
EU Guidelines is according to draft – USP Chapter 1116 and EU Guide to CRITICAL GOOD MANUFACTURING PRACTICE-(cGMP)
Clean Room Perfomance Test CPT:

1) Grade A : < 1 cfu/m3
2) Grade B : 10 cfu/m3
3) Grade C : 100 cfu/m3
4) Grade D : 200 cfu/m3

Airbone Test		
Parameter	Pre Sertu	Post Sertu
Total Bacterial Count	1433 Cfu / m3	186 cfu / m3
Total Fungus Count	1433 cfu / m3	186 cfu / m3



SERTU LIQUID DETERGENT – PERSONAL CARE USAGE



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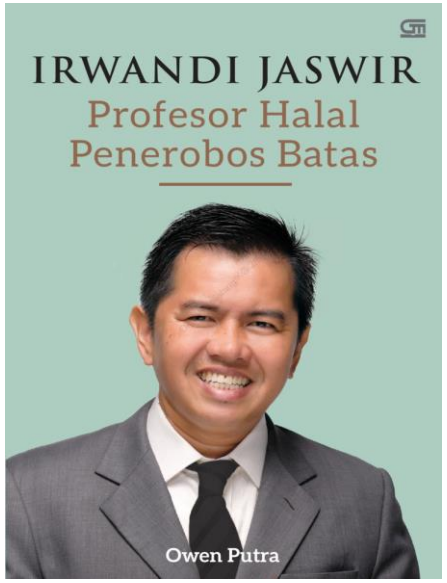
2018

1980

1997

2011

2015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