REGIONAL CONFERENCE ON FOURTH INDUSTRIAL REVOLUTION

National Centre of Excellence (CoE) on Smart Manufacturing

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SIRIM Berhad

23 October 2018

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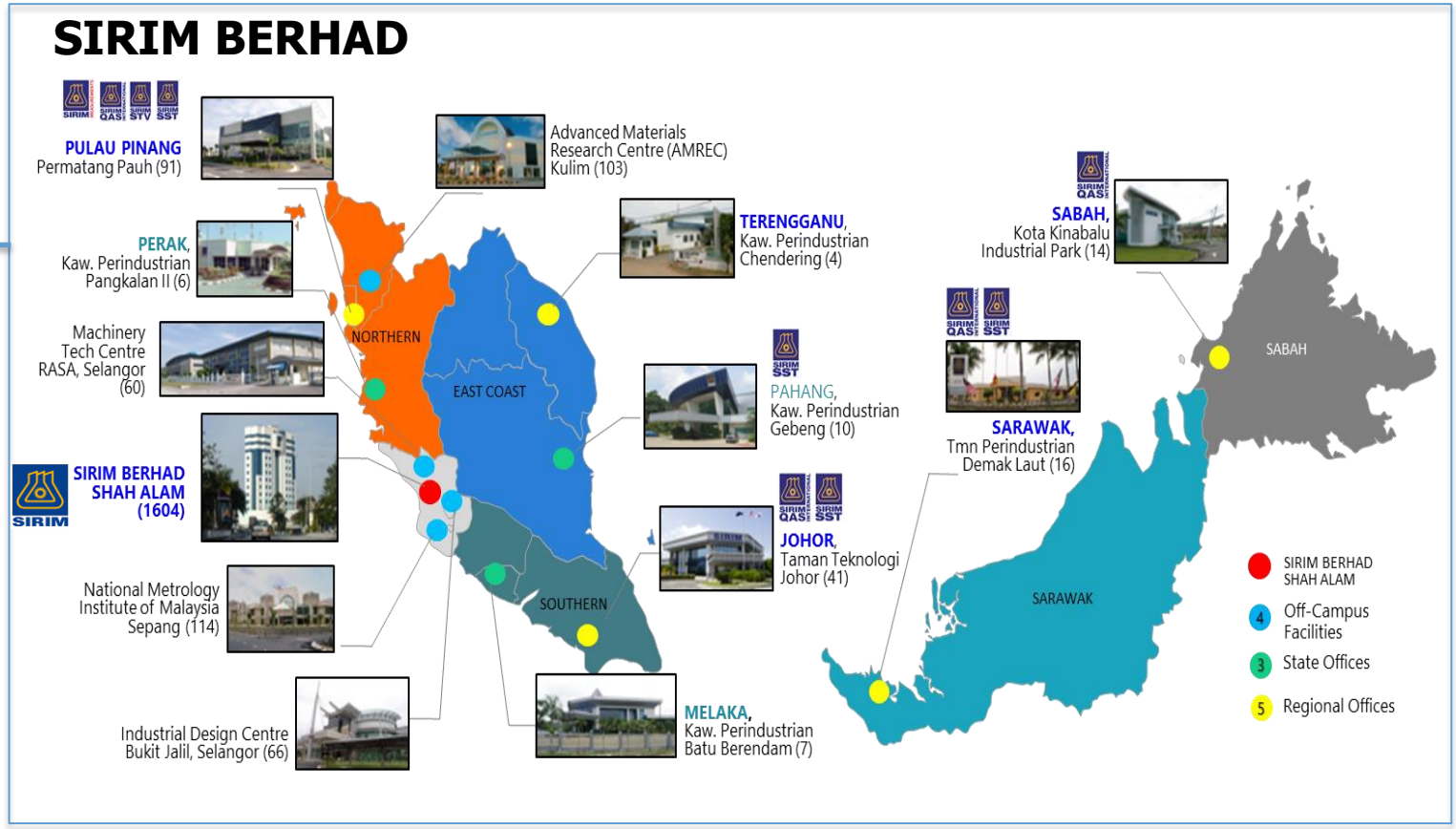
MESTECC PUTRAJAYA

Ministry of Energy, Science & Technology, Environment and Climate Change



CURRENT STATE & PERCEPTION FOR INDUSTRY 4.0 IN MALAYSIA FOR LOCAL MANUFACTURING COMPANIES & SMEs

81% **Malaysian manufacturers not using I4.0 Technologies**

Source: FMM-MIER Survey 2017

Low optimism level among suppliers & manufacturers **38%**

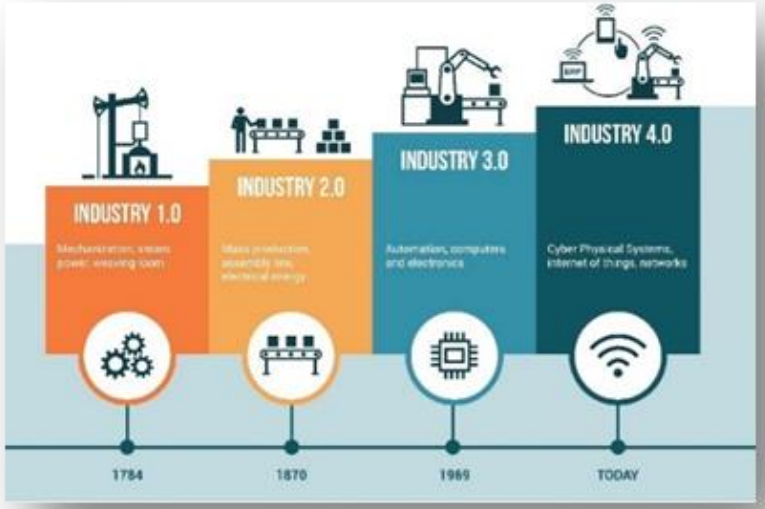
Source: McKinsey, Feb 2018

62% **Insufficient knowledge and skills of employees on I4.0 in SMEs**

Source: 3Q 2017 SME Survey by SME Corp. Malaysia

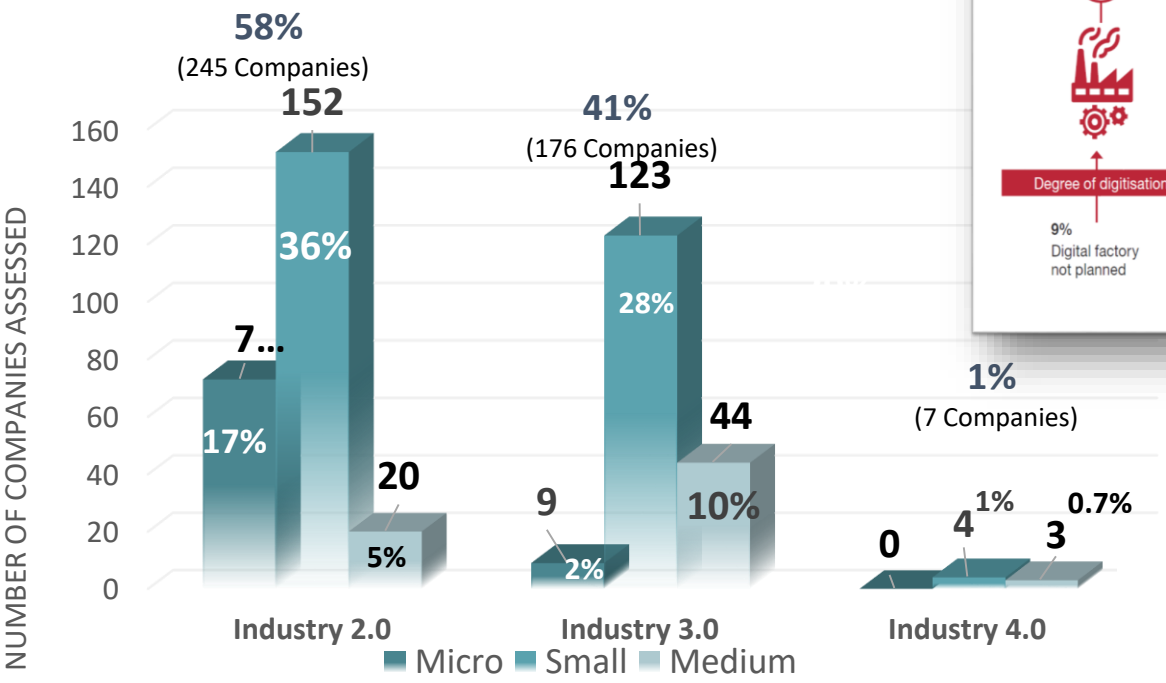
SMEs using I4.0 technologies **1%**

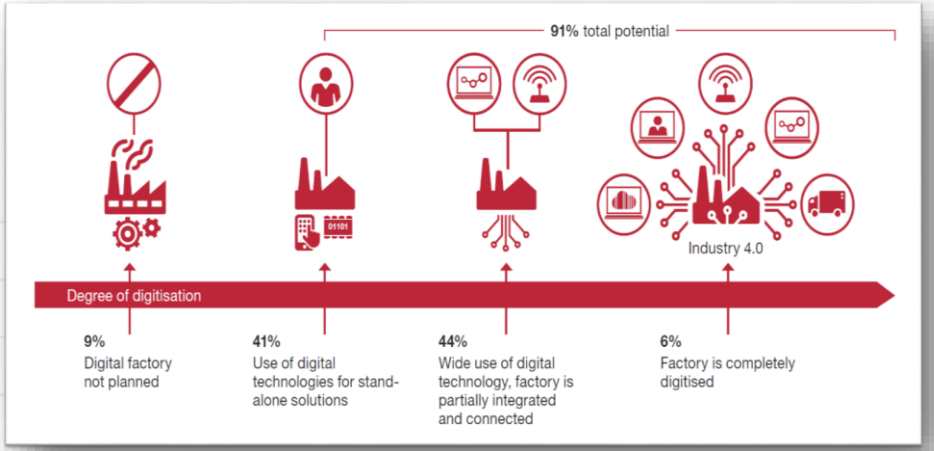
Source: SIRIM-Fraunhofer Technology Audit,2017



INDUSTRY ADOPTION OF I4.0 TECHNOLOGIES IN MALAYSIA

0.2 out of 10 companies in Malaysia are investing in digital factories
Total Manufacturing companies audited = 428





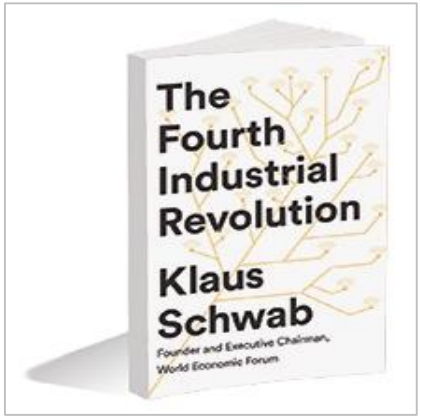
9 out of 10 companies in Germany are investing in digital factories

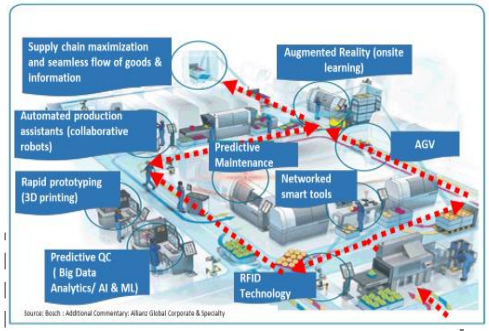
**Data from SIRIM-Fraunhofer Technology Audit*

KEY STRATEGIES OF MESTECC IN 4IR

AWARENESS

Increase awareness and understanding of 4IR concept, technologies & benefits to stimulate industry adopton



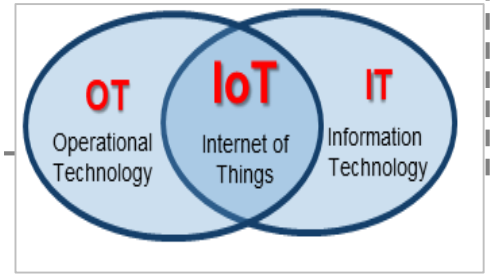


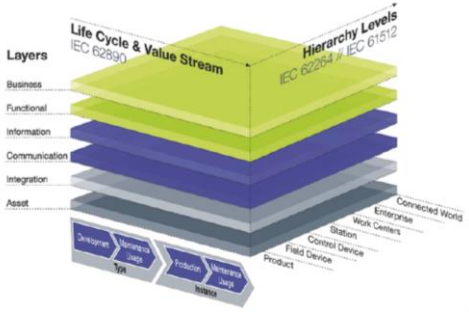
TECHNOLOGY

Accelerate technology development, innovation and adoption for industry growth

MARKET DRIVEN SOLUTION

Provide 4IR solutions across industries to realise socio-economic and productivity impact accross industries



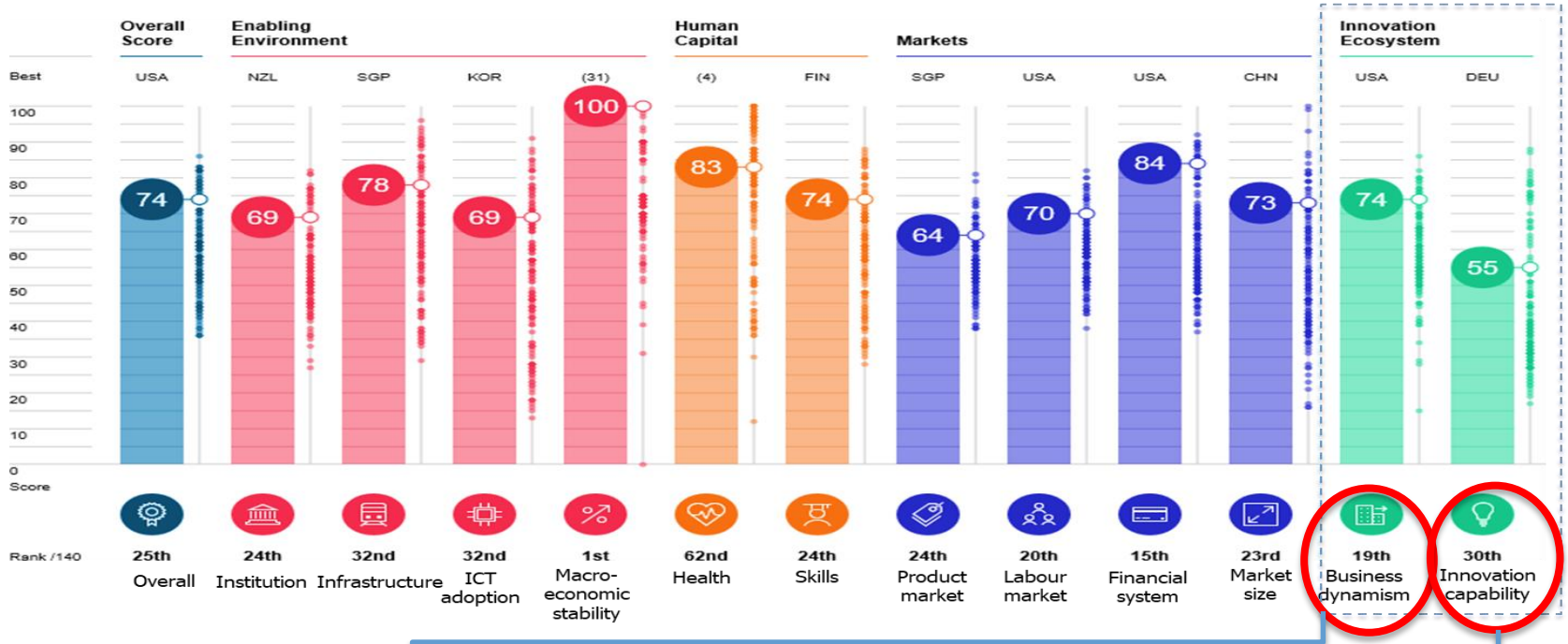


STANDARDS

Develop standards, guidelines and SOP for interoperability & better industry market access

Disruptive . Innovative. R&D. Multi-stakeholder

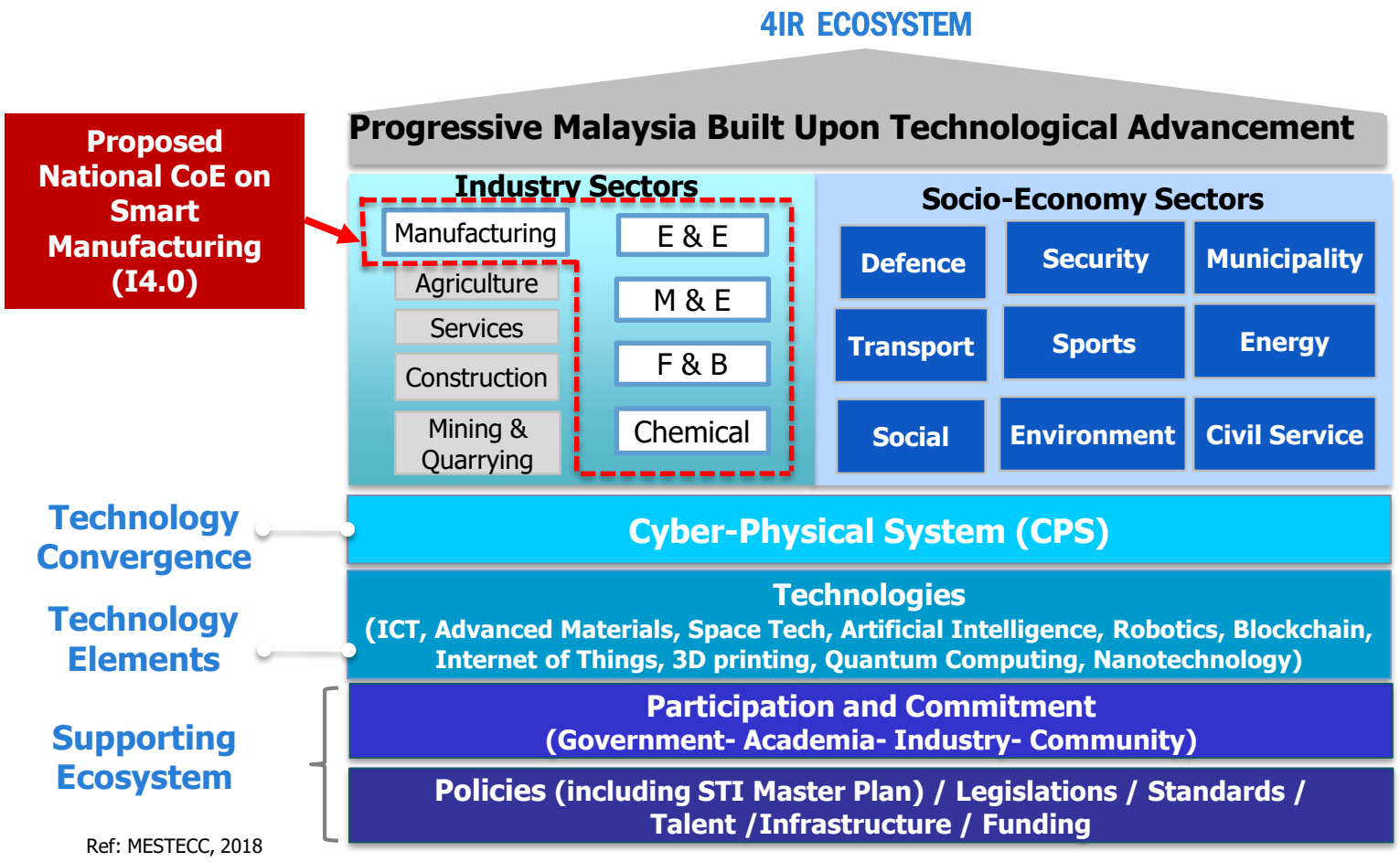
SMALL GAIN IN MALAYSIA'S GLOBAL COMPETITIVENESS RANKING 4.0



- Growth of **innovative** companies **increased from 69.6 to 71.5 points**
- Companies embracing **disruptive** ideas **increased from 66.1 to 69.9 points**
- **Multi-stakeholder** collaboration **increased from 70.5 to 71.8 points**
- **Research and development slight increase from 43.1 to 43.8 points**

Source: WEF, Global Competitive Report 2018

POSITIONING OF SMART MANUFACTURING IN THE 4IR ECOSYSTEM



Ref: MESTECC, 2018

Initiatives on National Centre of Excellence (CoE) on Smart Manufacturing

MESTECC/SIRIM INITIATIVE -NATIONAL CoE ON SMART MANUFACTURING

ROLES

1. **STANDARDS FOR INTEROPERABILITY**
   Standards, guidelines, best practices & specifications
2. **COMPETENCY & CAPACITY BUILDING**
   Training programmes for talent development
3. **TECHNOLOGY ADOPTION**
   R&D Programmes for smart innovations & cyber-physical system;

   Commercial-ready smart manufacturing technologies

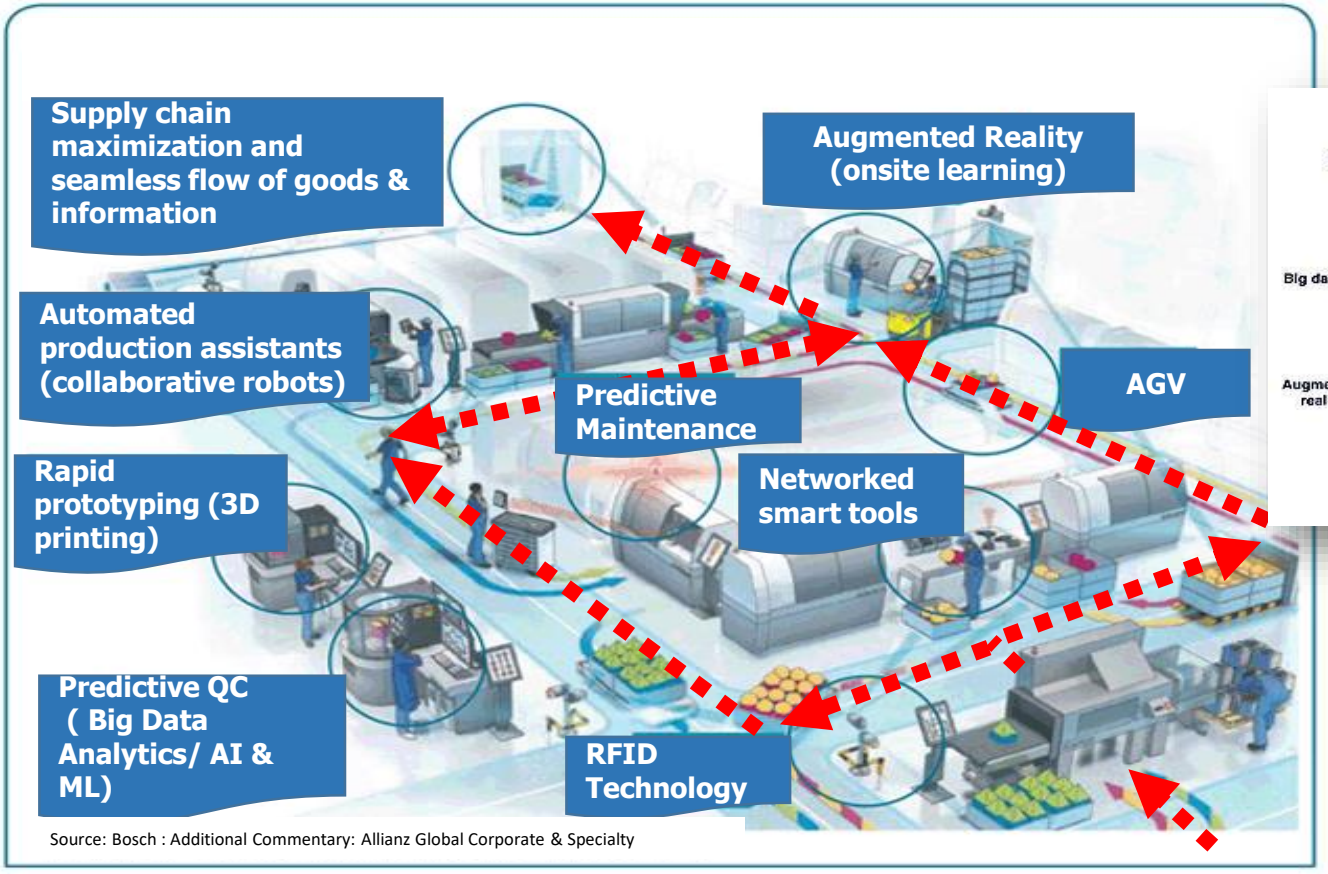
IMPACT

Accelerate technology adoption that contribute to higher growth of the industry

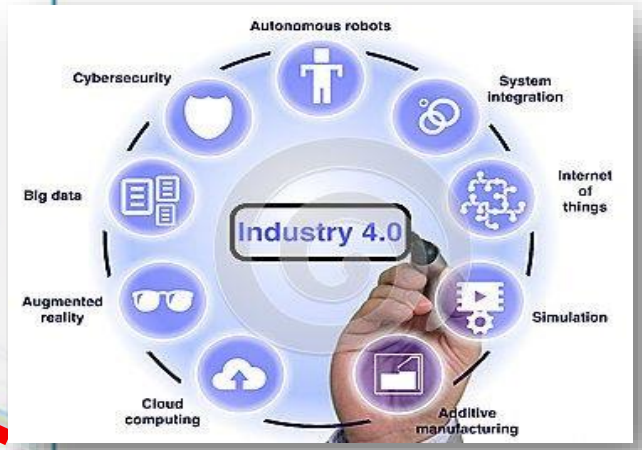
Structured transformation of the industry that lead to **bigger market access and revenue growth**

Strengthening Malaysia's industrial innovation & technological competitiveness for higher efficiency & productivity of local manufacturing companies

SMART MANUFACTURING EXAMPLES OF TECHNOLOGIES USED AT PRODUCTION LEVEL

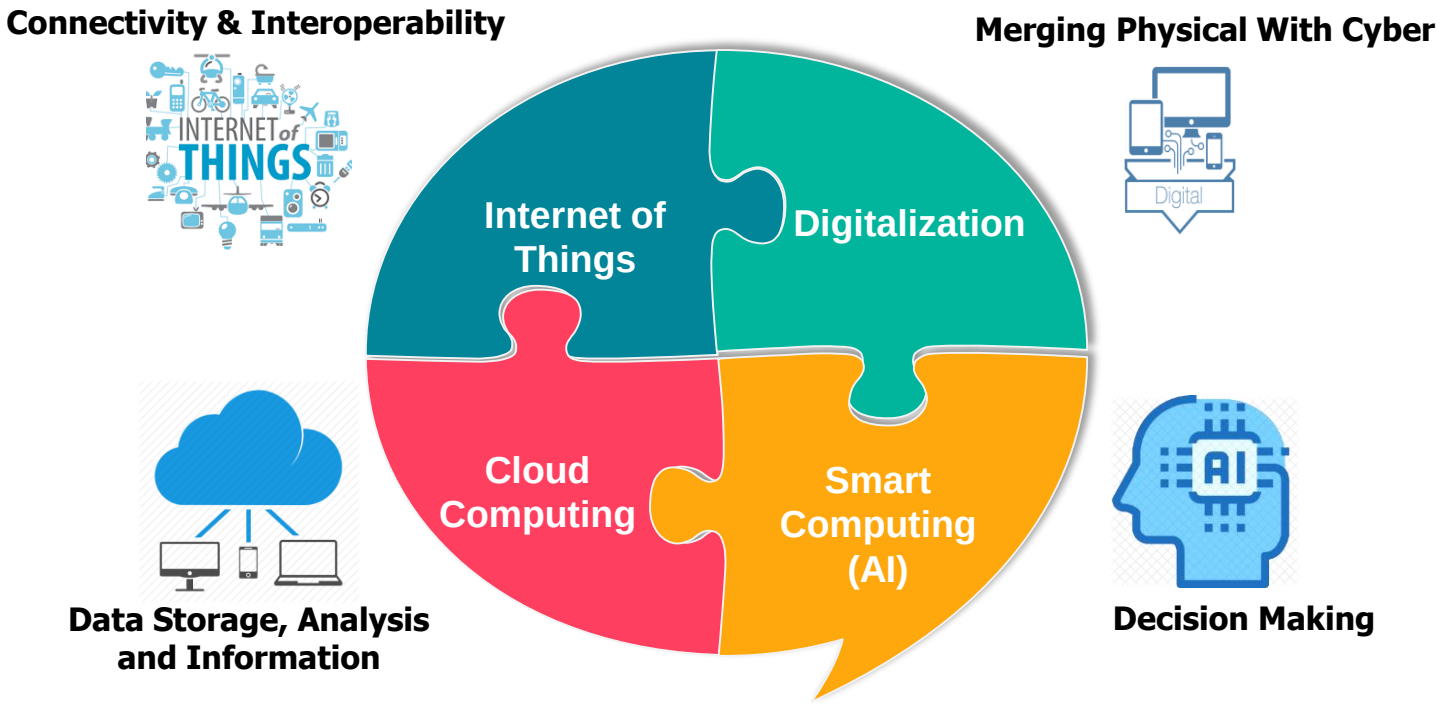


Source: Bosch : Additional Commentary: Allianz Global Corporate & Specialty



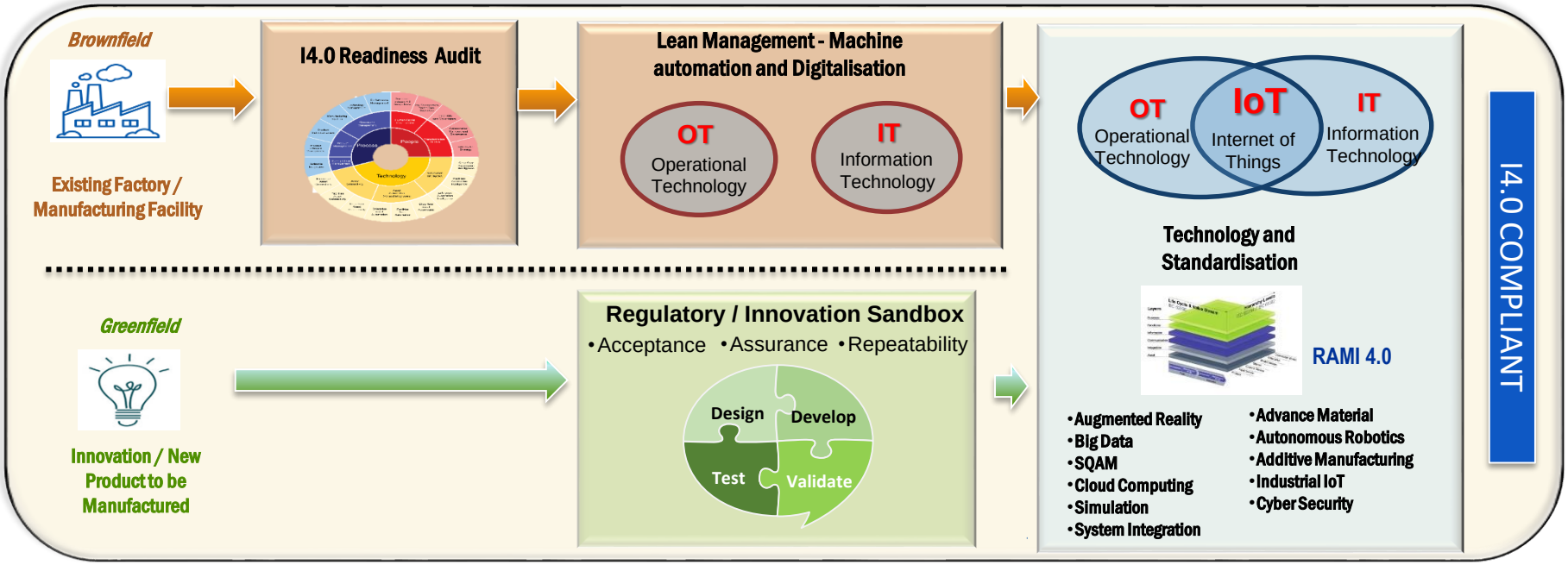
Technology Pillars

CORE COMPONENTS OF INDUSTRY 4.0/ SMART MANUFACTURING



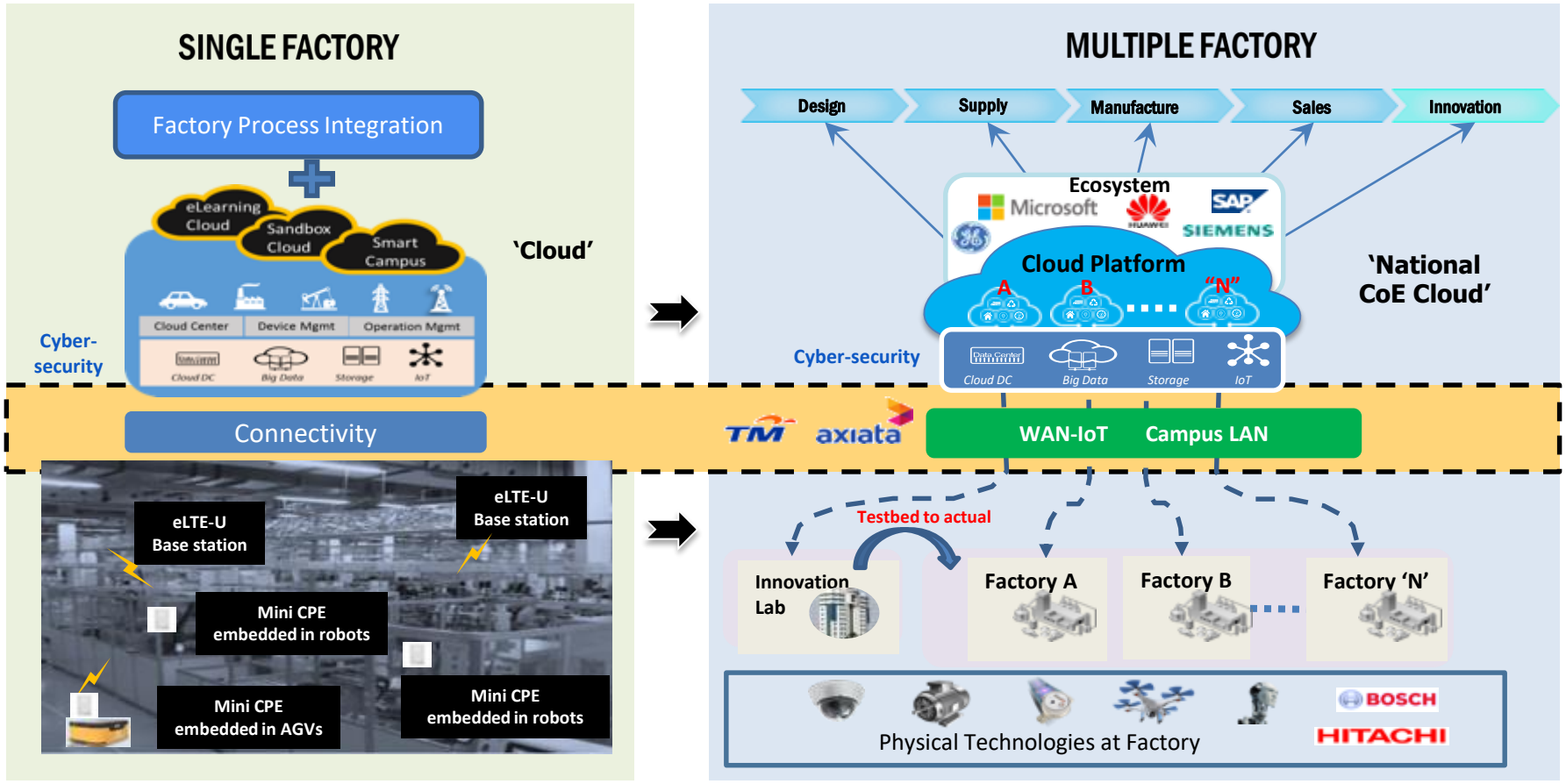
These technologies enable interaction between assets within the manufacturing enterprise (vertical) and other enterprises along value chain (horizontal)

IMPLEMENTATION MODEL & PROGRAMME OF THE NATIONAL CoE ON SMART MANUFACTURING

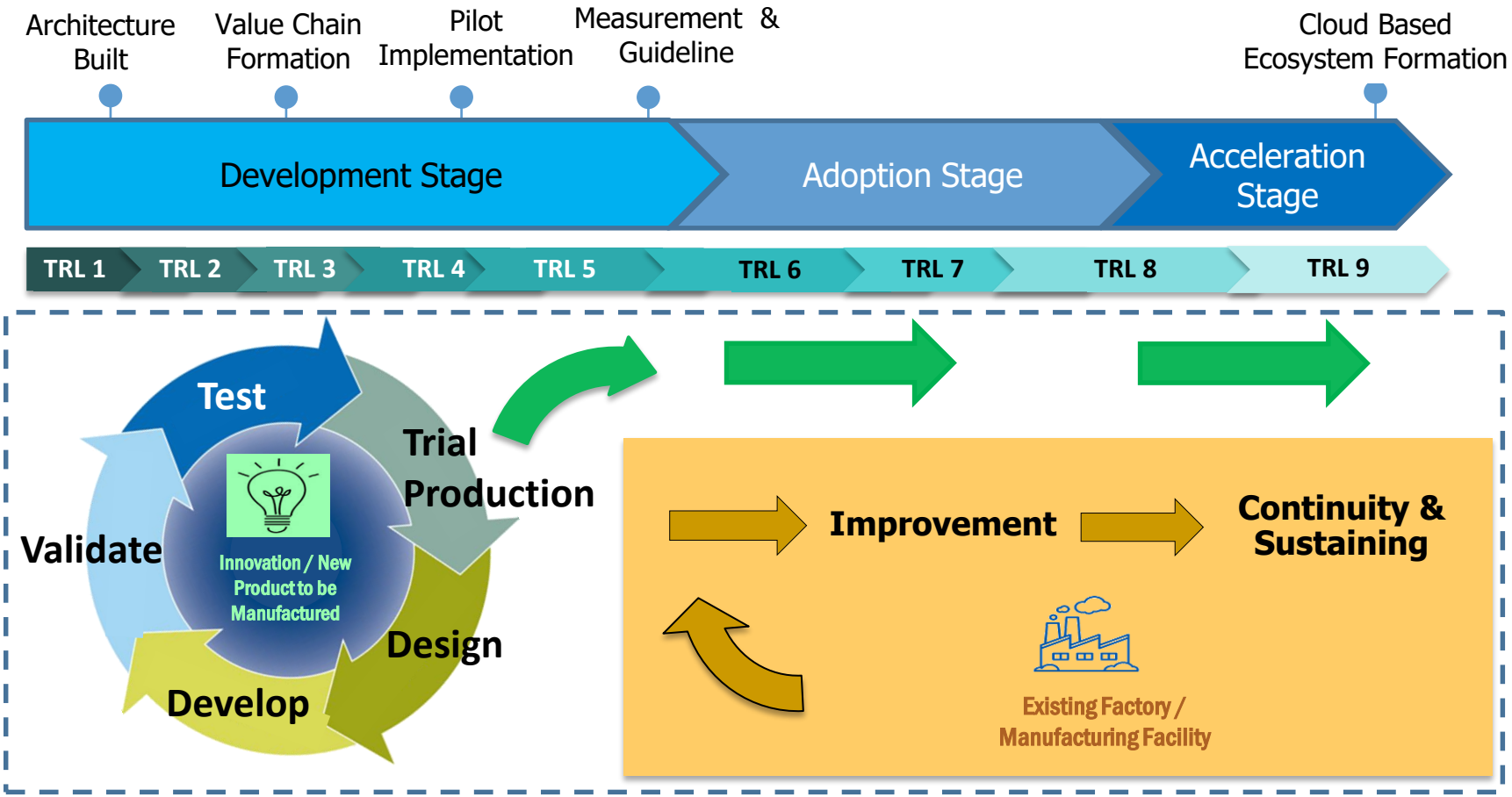


P1: Routing the Future Readiness	P2: Standardisation	P3: Innovation Accelerators	P4: Cyber Physical Progression
Development of competent and high skilled workforce	Development of standards, guidelines, best practices, specifications	New smart innovation development programmes based on Regulatory / Innovation Sandbox	Retrofitting machines to enable Industry 4.0

ARCHITECTURE FOR SMART MANUFACTURING ADOPTION



USING DIGITAL INNOVATION SANDBOX FOR SMART MANUFACTURING SOLUTION



Standardisation efforts at the ISO and IEC – A Journey

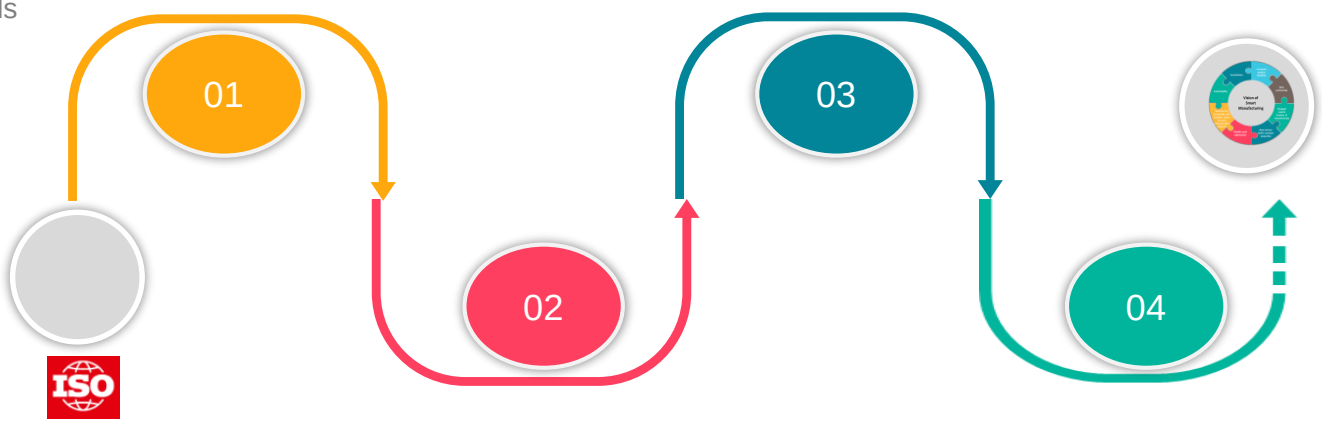
In June 2015, ISO established ISO SAG on I4.0/Smart Manufacturing to develop ISO future approach on "Industry 4.0/Smart Manufacturing"

- **Definition** of I4.0/Smart Manufacturing
- Established **vision** of I4.0/Smart Manufacturing
- **Identify gaps** and areas where ISO committees may contribute additional needed standards

ISO/IEC Smart Manufacturing Standards Map Joint Working Group (ISO/SMCC – IEC/SEG 7 Task Force)

- standards map project plan for the June 2018 TMB meeting

Realization of vision of I4.0/Smart Manufacturing



MY - 13 "P' and 4 "O" memberships in TC relevant to I4.0

ISO Strategy Advisory Group on I4.0/Smart Manufacturing

ISO Smart Manufacturing Coordinating Committees (ISO/SMCC)

- coordination among ISO committees and IEC/SEC 7 to ensure harmonised approach to I4.0/Smart Manufacturing and review gap analysis

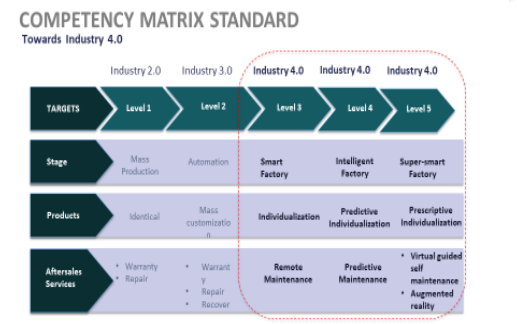
ISO/IEC Joint Working Group 21
(ISO/IEC JWG 21) "Smart Manufacturing Reference Model(s)"

- harmonise existing reference models and to Smart Manufacturing reference models

STANDARDISATION FOR INTEROPERABILITY IN SMART MANUFACTURING

READINESS & MATURITY STANDARDS

Readiness and maturity related standards to determine the status of Industry 4.0

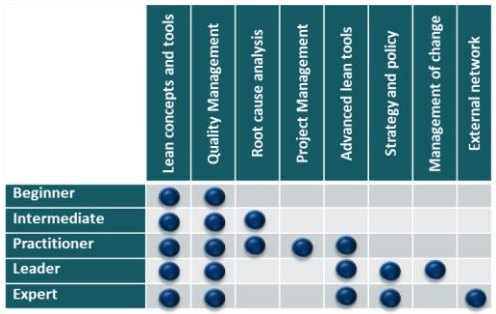


ADOPT & ADAPT RELEVANT ISO/IEC STANDARDS

Adopt and adapt standards published by ISO/IEC according to relevancy and to suit local industry

BRIDGING GAPS THROUGH GUIDELINES, CODE OF PRACTICE TOWARDS INDUSTRY STANDARDS

Develop guidelines, code of practice towards industry standards based on the characteristics of Industry 4.0 to bridge the gaps to implement Industry 4.0



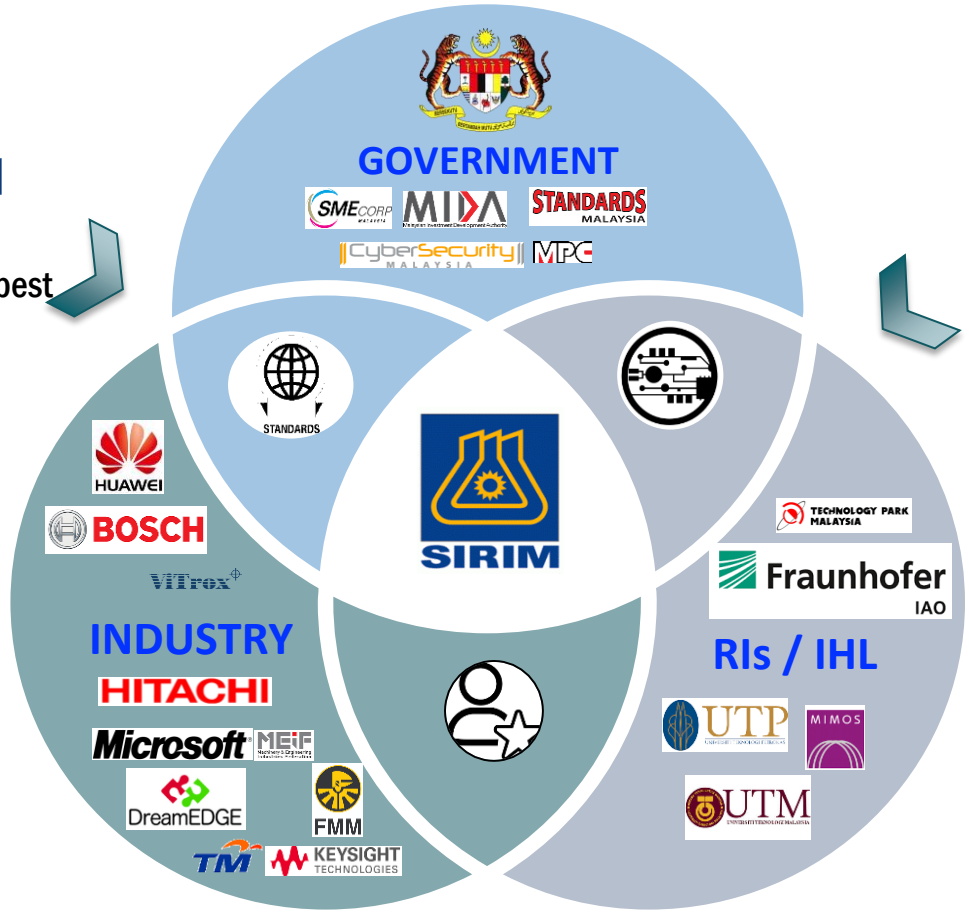
COLLABORATION MODEL OF THE NATIONAL CoE ON SMART MANUFACTURING

STANDARDISATION

Develop, educate and disseminate knowledge and best practices

COMPETENCY

Enhance and develop in-house and national expertise and competencies



TECHNOLOGY

Design and implement total solutions for compliance

Disruptive . Innovative. R&D. Multi-stakeholder

Implementation

COMPETENCY & CAPACITY BUILDING

- Awareness Seminar 'Meeting Industry 4.0 Aspirations' (for Industry/SMEs) — COMPLETED PROJECTS
- I4.0 Training for beginners in Simulation and Additive Manufacturing (for Industry/SMEs) — COMPLETED PROJECTS
- Awareness Training for Industries on Predictive Based Maintenance (for Industry/SMEs) — COMPLETED PROJECTS
- Industry 4.0 readiness assessment program i-Leap (for MITI) — COMPLETED PROJECTS
- Development of I4.0 Awareness Guidebook (for Industry/SMEs) — ON-GOING


List of Trainings

- 6 Trainings including introduction & awareness, additive manufacturing, autonomous robotics, IoT, RFID and SCADA
- Trainings on Concept, Technology and Applications for Industry 4.0 Digital Manufacturing Joint Programmes with:
  - Uniten – 3 Training modules
  - PSDC – 4 Training modules
  - GMI – 6 Training modules

TECHNOLOGY DEVELOPMENT & ADOPTION

- COMPLETED PROJECTS — Strengthening products derived from stingless bee (kelulut) industry through IoT application (for Kelulut Industry)
- COMPLETED PROJECTS — Lighting Alarm Triggering System (LATte) (for Company)
- COMPLETED PROJECTS — Seed Production Integrated Tracking System (SPITS) (for GLC)
- COMPLETED PROJECTS — Multiple Access Detection Algorithm for File Retrieval System (MADA) - (for GLC)
- COMPLETED PROJECTS — Housing Demand Prediction System (HDePS)- (Research)
- ON-GOING — "Retrofit" Programme in preparing SMEs towards Industry 4.0 (for Industry/SMEs)
- ON-GOING — Integrated Smart manhole system management through IoT application (for Company)
- ON-GOING — Predictive Based Maintenance Solution for Industries (for SMEs in Rail & Power sector)

Lighting Alarm Triggering System (LATte)

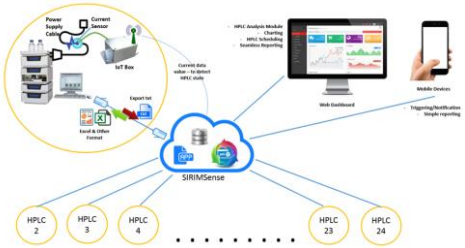
Stingless bee (kelulut) industry through IoT application

RETROFITTING SMEs TOWARDS I4.0

On-going 3 projects for selected SMEs based on findings from Readiness Assessment

Project 1

Centralised Analytic for High-performance Liquid Chromatography (HPLC) Product

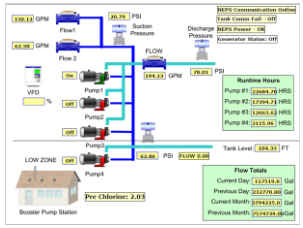


Project 2

Automated Trolley Flow Management System using Auto Guided Vehicle

Project 3

Integrated Barcode System for ERP and Water Treatment Plant Health Monitoring

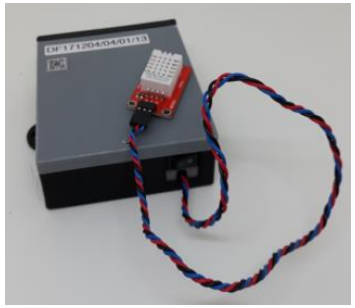


www.data-command.com/applications/pump-monitoring/

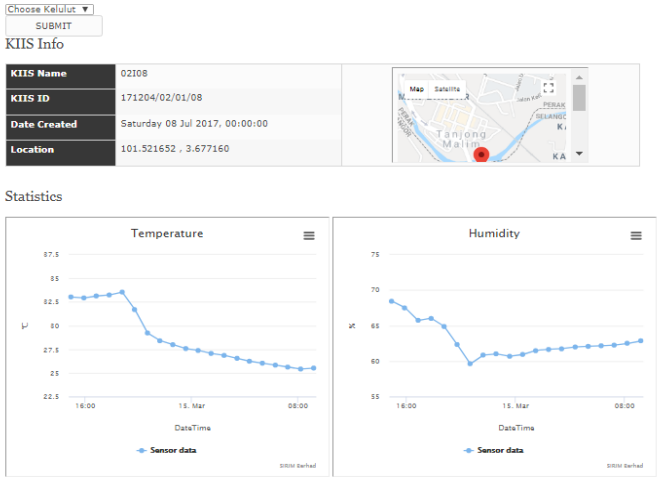
IoT APPLICATION – KELULUT INTEGRATED INFORMATION SYSTEM (KIIS)

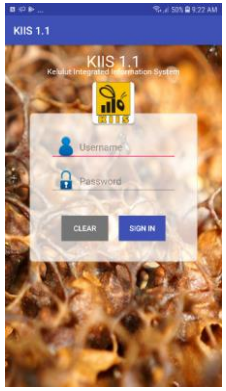
Uses digital sensor to measure the temperature and humidity of stingless bee (Kelulut) hive automatically, periodically and in real time

1. KIIS IoT device



2. KIIS WEB
registration, parameter setting, transaction, reporting





3. KIIS APPS
notification, registration, harvesting

The device sends these data wirelessly to the base station via wireless sensor network (WSN) and subsequently to the cloud server via gsm/gprs module before they can be accessed via Web PC and android based smartphone

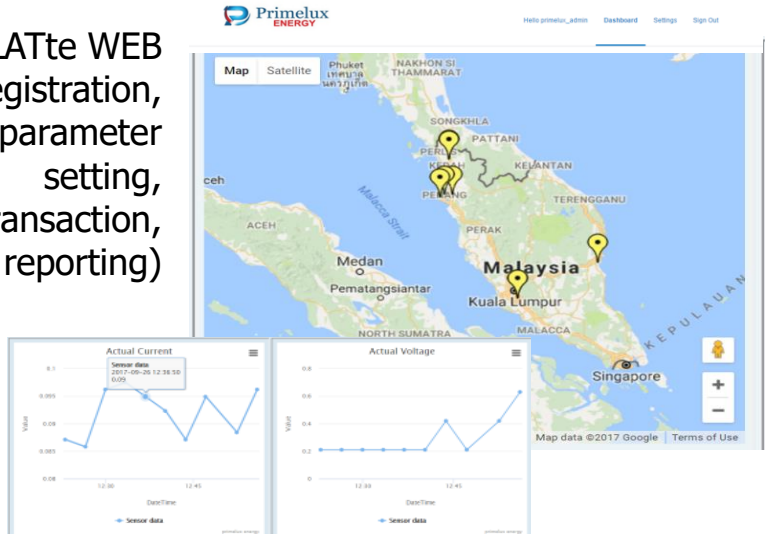
IoT APPLICATION – LIGHT ALARM TRIGGERING SYSTEM (LATTE)

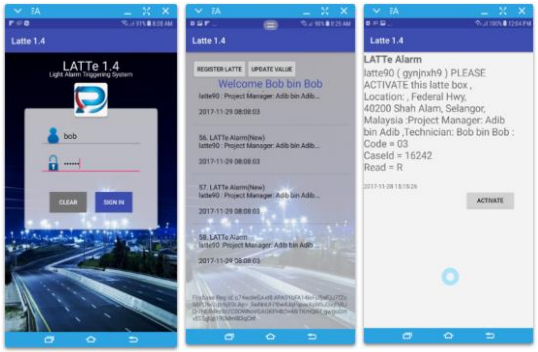
LATte has an IOT (Internet of Thing) based device that monitors the failure of lighting system.

The device measures street light current and voltage and sends the data to the Cloud Server in real time continuously via GSM Module.

1. LATte box

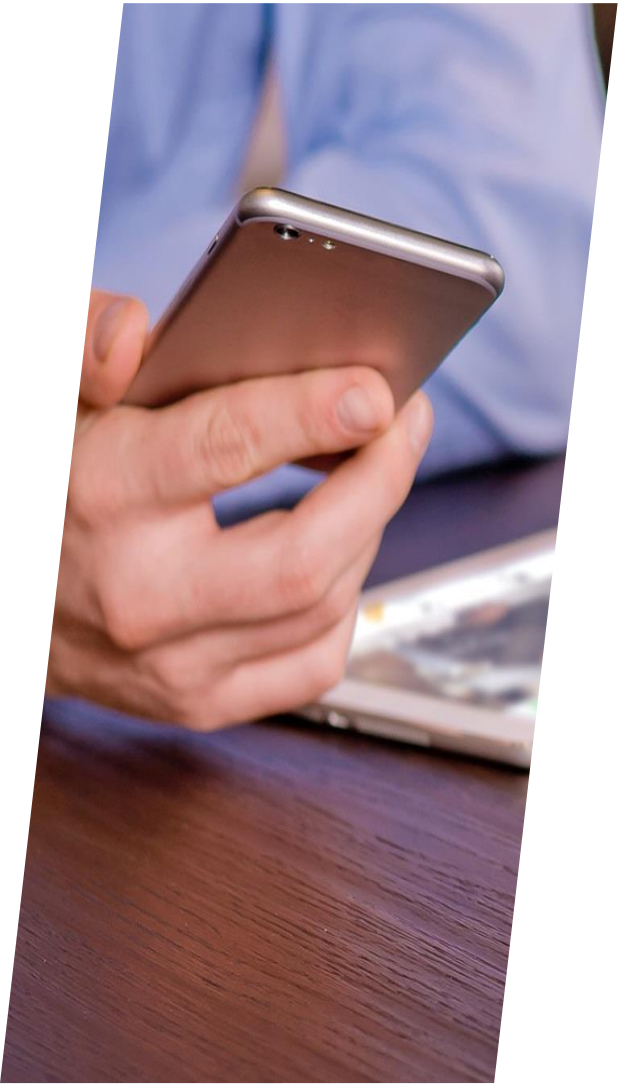
2. LATte WEB (registration, parameter setting, transaction, reporting)





3. LATte APPS (notification, LATte box registration, resolved failure)

Once failure light detected, the device automatically triggers the Maintenance Team via Smart Phone to repair or replace malfunctioned light.



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