

Digital Skills Required in the Future Labour Market



Keynote by :

Prof. Ir. Dr. Khairul Salleh Mohamed Sahari, FASc
Vice-Chancellor
Universiti Tenaga Nasional (UNITEN)

About the presenter

Tertiary Education

Bachelor of Mech. Eng.

- Waseda University (1996-2000)

Master of Mech. Eng.

- Kanazawa University (2000-2002)

PhD (Engineering)

- Kanazawa University (2002-2006)

Post-Doctorate

- Kanazawa University (2006-2007)
- Kanazawa University (2010)- MOSTI

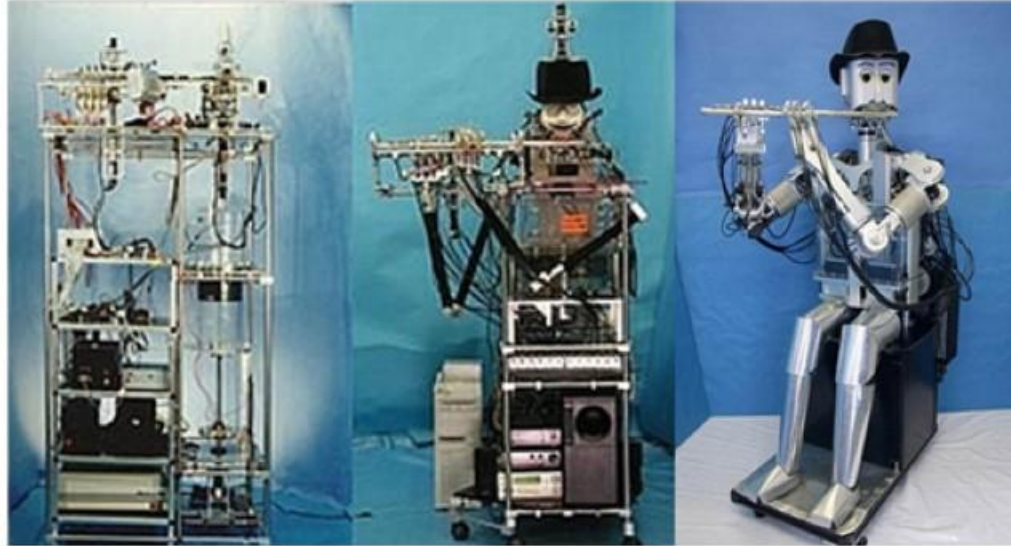
Working Experience

Universiti Tenaga Nasional

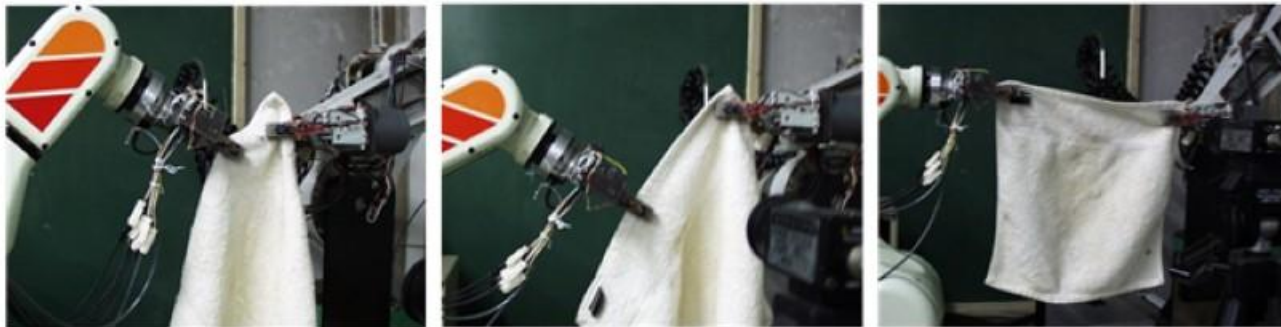
- 2007-

Malaysian Qualifications Agency

- 2019-2024



Anthropomorphic Flutist Robot



Clothes Manipulation Robot



Selected research works

Clothes Folding Robot (at NICE 2017)



财经 商业 视频 时事 国际 地产 闻天下 副刊 地方 体育 娱乐

主页 > 时事 > 要闻 > 副揆与Baxter机器人

副揆与Baxter机器人

80点 2017年10月12日

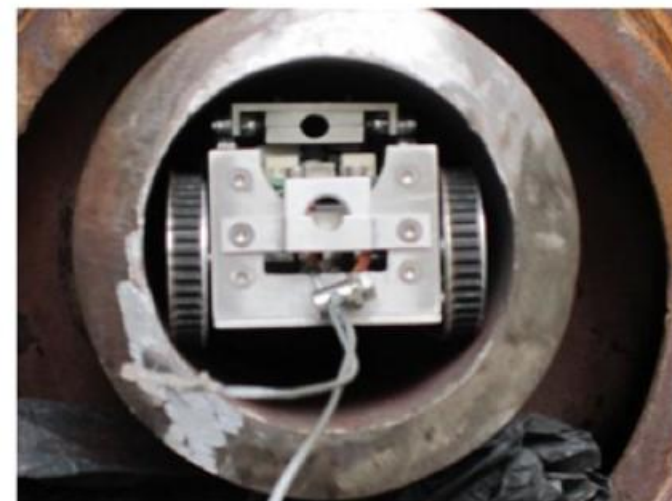
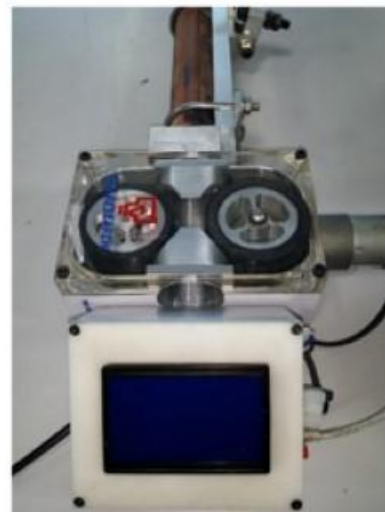
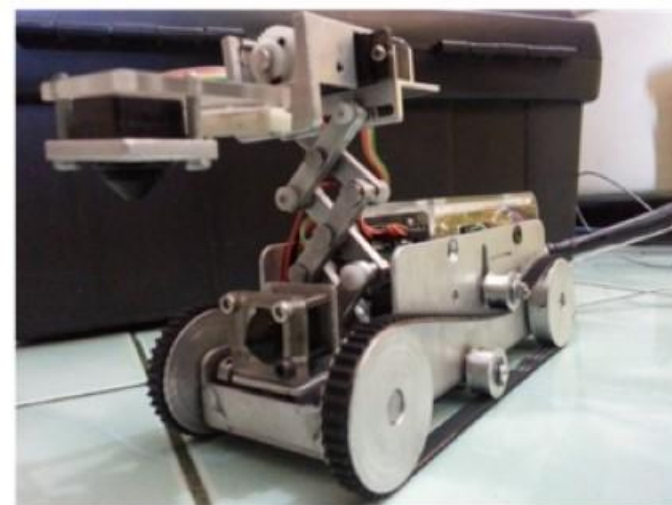


2017年国家革新和创意经济博览会昨天在吉隆坡大马科技园举行。这项盛大的科技展览展出全球先进的Baxter机器人。这些机器人游刃有余的应用双臂进行工作，如把布匹折得整整齐齐。

Boiler Header/Tube Inspection Robot

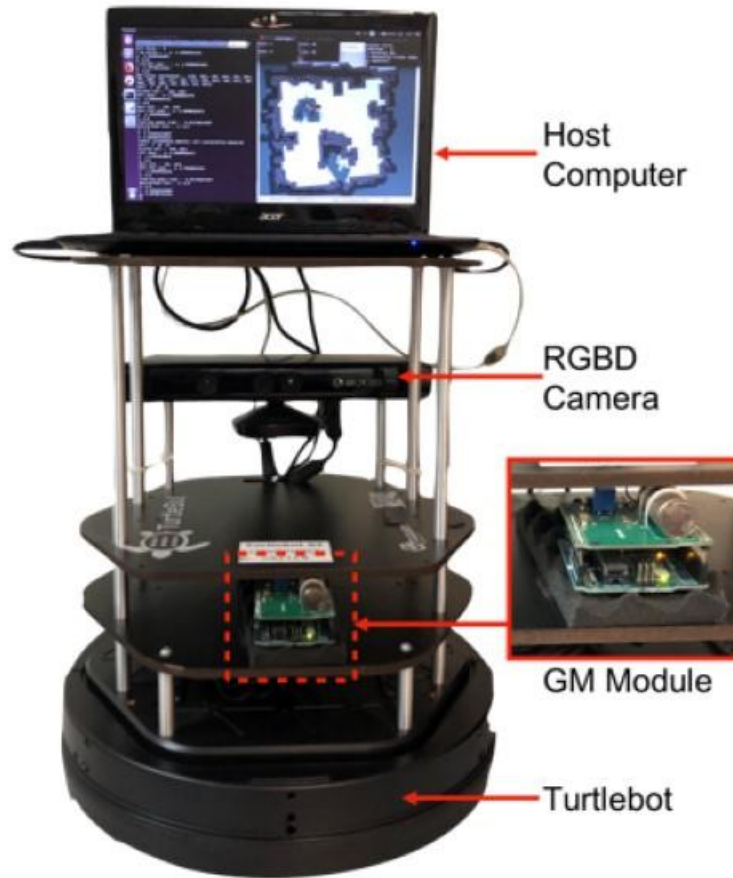


OTRIS 8.0
Outer Tube Robotic Inspection System

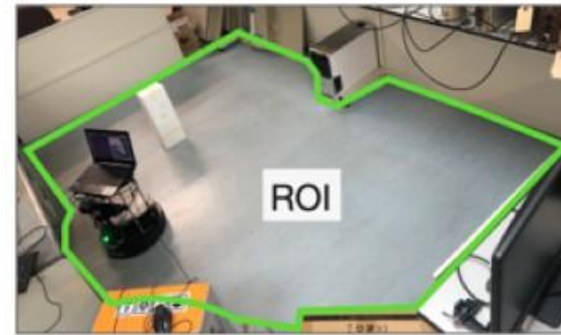


Selected research works

Radiation Mapping Robot

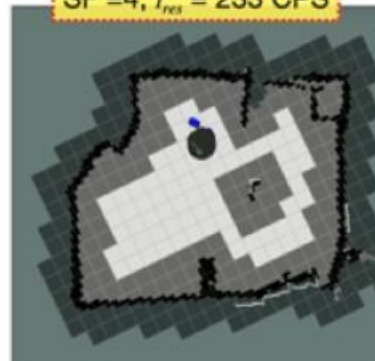


2D occupancy map



Actual location

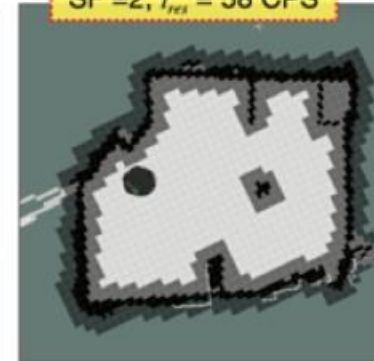
SF = 4, $I_{res} = 233$ CPS



SF = 3, $I_{res} = 119$ CPS

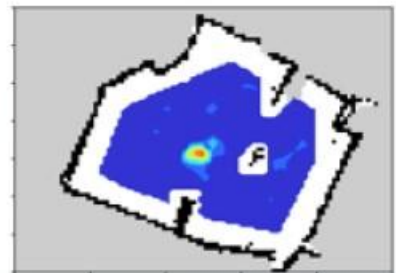
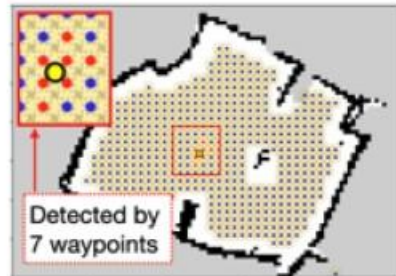


SF = 2, $I_{res} = 58$ CPS



Tested with
300 CPS
hotspots

$I_{res} = 58$ CPS



UNITEN in Brief – TNB's Endeavour Into Education & Training

Established **1997**



Wholly owned by

Tenaga Nasional Berhad



885
Staff

407
Academic
Staff

478
Admin &
Technical



42,550

Total graduates since 1998
2,209 international
graduates from **59**
countries working in
73 countries



6,369

Student Enrolment
Local: 5,023 (79%)
International: 1,346 (21%)
from **45** countries



97%

Employability Rate
(2024)

Putrajaya Campus
483 acre



25 km to Kuala Lumpur
0.3 km to Putrajaya
0.5 km to IOI City Mall



Campuses



**Sultan Haji Ahmad Shah
Campus (KSHAS)**
168 acre



54

Accredited
Academic
Programmes

- PhD & Masters
- Bachelor
- Diploma
- Foundation

5

COLLEGES

- College of Engineering
- College of Computing & Informatics
- UNITEN Business School
- College of Graduate Studies
- College of Continuing Education

UNITEN offers a comprehensive range of services to support national development and energy transition



1. Academic

- Industry-relevant undergraduate & postgraduate programmes
- Accredited by EAC, MQA, and other accredited bodies (local and international)
- Flexible learning: full-time, part-time, online distance learning
- Global partnerships for exchanges & dual degrees



2. Research

- Houses centres of excellence and specialised research chairs in energy-related fields
- Facilitates industry-funded research, IP commercialization, and technology incubation via UR&D
- Integration of research outcomes into academic curriculum



3. Professional Services

- Customised training for industry & public sector
- Expertise in technical & soft skills development
- Consultancy in feasibility studies & assessments
- Supports IR4.0 & energy transition upskilling

Future Energy Executives

42,550 **UNITEN Alumni** from 73 countries

54 **Accredited** Academic Programmes

5 5 Years Accreditation by **Engineering Accreditation Council (EAC)** to all Engineering Bachelor Degree Program and by **Malaysia Board of Technologists (MBOT)** to all Computing and Informatics Programs

#551 **QS World** University Rankings 2026

#601–800 **THE World** University Rankings 2025

97% Employability Rate 2024

2022 **National Energy Centre** was established



Research Ecosystem

To enhance research culture, collegiality, mentorship

Outcome

- Impactful Research to Nation
- Aligning Research Outcome into Academic Curriculum
- Attracting Post Graduate Student

Research & Innovation

College Research Centre

- 1.College of Engineering (COE)
- 2.College of Computing and Informatics (CCI)
- 3.UNITEN Business School (UBS)
- 4.College of Continuing Education (CCEd)

Office of Deputy Dean (Research & Innovation)

Research Institutes



Institute of Sustainable Energy (ISE)



Institute of Energy Infrastructure (IEI)



Institute of Power Engineering (IPE)



Institute of Energy Policy and Research (IEPRE)



Institute of Informatics & Computing in Energy (IICE)



Institute of Nuclear Energy (INE)

HiCOE by MOHE

AAIBE

Chair for Renewable Energy

DOSH Centre of Excellence for Electrical & Energy Safety

Energy Commission
Chair in Energy Economics

TNB TSLM
Chair in Energy Informatics

Research Excellence Centre

- 1.Research Grant
- 2.Publications
- 3.Exhibitions and Promotions
- 4.Research Competencies
- 5.RA & Post Doctoral
- 6.Knowledge Transfer

UR&D Sdn. Bhd

- 1.TNB Technology Fund
- 2.Industry Funded Research
- 3.Industry Partnership
- 4.IP & Commercialization
- 5.Technology Incubator
- 6.Research Technical Training



National Energy Centre

- 1.Energy Research Leadership
- 2.Energy Research Consortium
- 3.Energy Transition Academy
- 4.International Energy Research Network



Input

Process
Management

Output

UNITEN's National Energy Centre (NEC)



"NEC will serve as a national hub to advance the energy transition agenda through artificial intelligence technologies, supporting the National Energy Policy in achieving the Net Zero target by 2050."

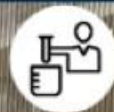
RESEARCH INSTITUTES



ISE

Institute of Sustainable Energy (ISE)

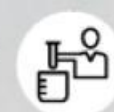
Sustainable energy solutions and environmental assessment.



IPE

Institute of Power Engineering (IPE)

Power system engineering and grid stability.



IEI

Institute of Energy Infrastructure (IEI)

Infrastructure integrity and risk reduction/mitigation.



IEPRe

Institute of Energy Policy & Research (IEPRe)

Energy policies and energy economics.



IICE

Institute of Informatics & Computing in Energy (IICE)

Digital solutions for energy management and security.

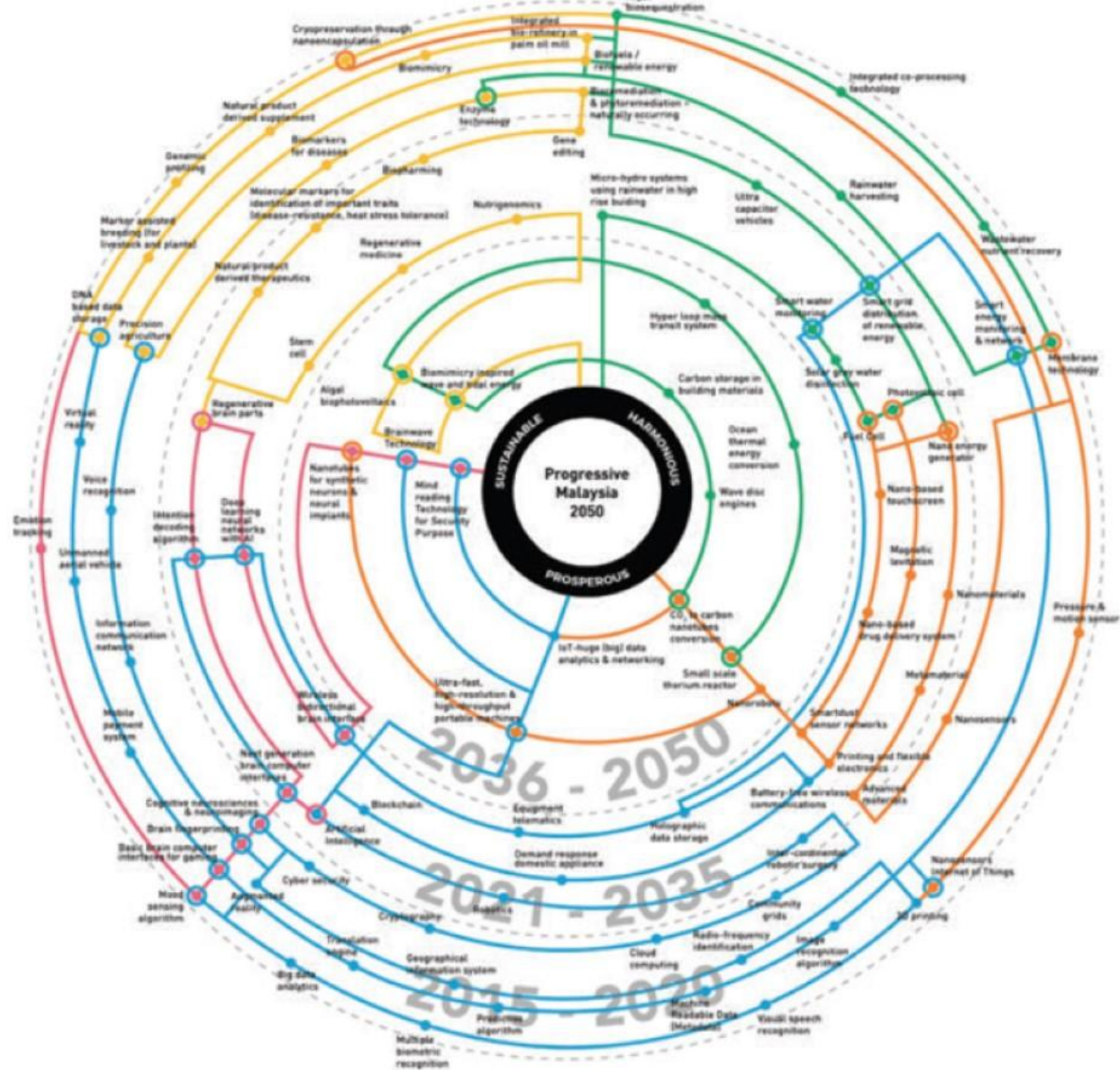


INE

Institute of Nuclear Energy (INE)

Nuclear power (fusion and fission), nuclear education and awareness

Malaysia's Emerging Technology



Global Trends: Change in Roles & Skills Towards 2025 due to advances in technology

Rapid advances in technology in AI, automation and robotics, by 2025 (2 years from now), **97 million new roles may emerge** and **85 million jobs displaced** due to shift in the division of labour between humans and machines. This will change the nature and number of jobs available.

97 million



85 million

Growing job demand:

1. Data Analysts and Scientists
2. AI and Machine Learning Specialists
3. Big Data Specialists
4. Digital Marketing and Strategy Specialists
5. Process Automation Specialists
6. Business Development Professionals
7. Digital Transformation Specialists
8. Information Security Analysts
9. Software and Applications Developers
10. Internet of Things Specialists

Decreasing job demand:

1. Data Entry Clerks
2. Administrative and Executive Secretaries
3. Accounting, Bookkeeping and Payroll Clerks
4. Accountants and Auditors
5. Assembly and Factory Workers
6. Business Services and Administration Managers
7. Client Information and Customer Service Workers
8. General and Operations Managers
9. Mechanics and Machinery Repairers
10. Material-Recording and Stock-Keeping Clerks

By 2025, **50% of all employees** will need reskilling.

Critical thinking and **problem-solving** top the list of skills that employers believe will grow in prominence in the next five years

Type of skill

- Problem-solving
- Self-management
- Working with people
- Technology use and development

Top 10 Skills of 2025

-  Analytical thinking and innovation
-  Active learning and learning strategies
-  Complex problem-solving
-  Critical thinking and analysis
-  Creativity, originality and initiative
-  Leadership and social influence
-  Technology use, monitoring and control
-  Technology design and programming
-  Resilience, stress tolerance and flexibility
-  Reasoning, problem-solving and ideation

Source: Future of Jobs Report 2020. WEF, 2020.

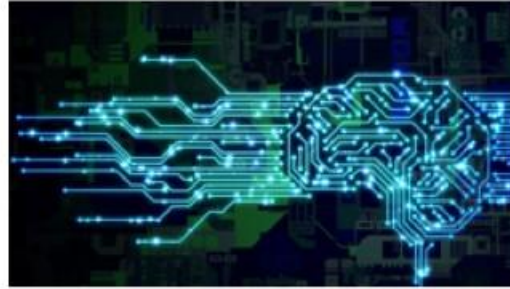
The Evolving Labour Market Landscape

Fourth Industrial Revolution



Advanced Technologies

AI, big data, cloud computing, robotics, and IoT are reshaping industries



Automation Trend

Routine tasks are increasingly automated, creating "hybrid jobs"



Digital Transformation

95% of companies leverage digital tools for communication and operations



Marketing Analyst

Data analytics skills for campaign interpretation

Engineering Developer

Programming skills for digital twins implementation

Finance Officer

AI dashboards for financial analysis

Healthcare Professional

Digital health technologies and data analysis

💡 50% of employees will require reskilling by 2027





Data Analytics & Big Data

- ✓ Data collection, cleaning and pattern analysis
- ✓ Dashboard creation and visualization

Key Tools:

Python R SQL Power BI Tableau



AI & Machine Learning

- ✓ AI model development and training
- ✓ ML pipeline management
- ✓ Prompt engineering

Key Focus:

AI Governance AI Ethics



Cloud Computing

- ✓ Cloud architecture and services
- ✓ Cloud platform management

Major Platforms:

AWS Azure Google Cloud



Automation & Robotics

- ✓ RPA expertise
- ✓ Industrial robots

Transforming Sectors:

Manufacturing Banking
Logistics



Cybersecurity and Digital Trust

- ✓ Risk management
- ✓ Network security

Emerging Skills:

Incident Response Ethical Hacking



Digital Product Innovation & Entrepreneurship

- ✓ Designing and launching new digital products and platforms
- ✓ Using data and AI to test, refine and scale business ideas
- ✓ Skills: product management, UX, digital business models

In an increasingly automated world, these skills differentiate humans from machines, providing competitive advantages that technology cannot replicate.

Cognitive and Creative Skills



Critical Thinking & Problem-Solving

Interpreting context, identifying nuanced problems, and devising creative solutions that AI alone cannot.



Creativity, Innovation & Digital Entrepreneurship

Generating novel ideas, envisioning new possibilities, and turning them into digital products, services and entrepreneurial ventures.



Adaptability & Agility

Being agile in acquiring new skills, adjusting to evolving tools and processes, and embracing new ways of working.



Ethical and Social Skills



Digital Ethics & Responsible AI

Understanding principles of privacy, transparency, and fairness in technology development and deployment.



Digital Communication & Collaboration

Effectively communicating and collaborating in digital environments through active listening and clear articulation.



“ *These human-centric skills ensure that technology serves human needs and objectives effectively.* ”

Future Job Landscape and Emerging Roles

Emerging Digital Roles



Data Analyst / Scientist



Cybersecurity Specialist



Cloud Architect



AI/ML Engineer



Automation Engineer



Digital Product Manager



AR/VR Developer



Smart Grid Specialist

Transformed Traditional Roles



Digital Construction Engineer



E-commerce Supply Chain Analyst



Digital Healthcare Technologist



Smart Manufacturing Technician

“

Every job will become a digital job

”



Collaborative strategies for universities, industry, and government



Universities

- ✓ Develop digital curriculum
- ✓ Establish research hubs



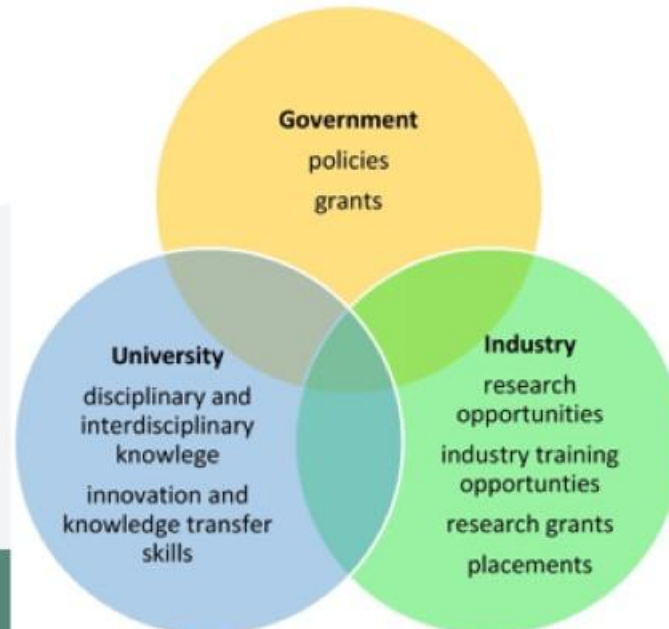
Industry

- ✓ Provide internship opportunities
- ✓ Offer continuous learning

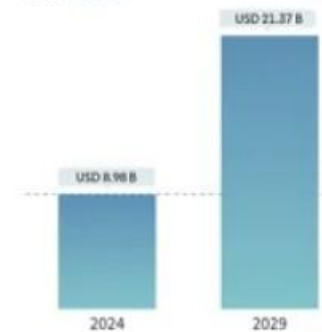


Government

- ✓ Create digital infrastructure
- ✓ Develop talent attraction policies



Malaysia Digital Transformation Market
Market Size in USD Billion
CAGR 18.92%



Source: Mordor Intelligence

| | |
|--------------------------|-------------------|
| Study Period | 2019 - 2029 |
| Base Year For Estimation | 2023 |
| Market Size (2024) | USD 8.98 Billion |
| Market Size (2029) | USD 21.37 Billion |
| CAGR (2024 - 2029) | 18.92 % |
| Market Concentration | Low |

Major Players



*Disclaimer: Major Players sorted in no particular order

What Universities Must Change in Teaching

Key transformations needed in higher education to prepare students for the digital future



Embed AI & Data Across Disciplines

Integrate AI and data tasks in business, health, law, engineering, and education to create interdisciplinary learning experiences.



Project-Based Learning

Replace textbook examples with real industry data projects to provide practical, hands-on learning experiences.



Digital Portfolios

Encourage students to build GitHub repositories, dashboards, and prototypes as evidence of skills and practical capabilities.



Micro-Credentials

Offer stackable short courses that contribute toward degrees, providing flexible learning pathways for students.

Key Takeaways and Next Steps

Key Takeaways



Embrace Change

Future labor market belongs to those who proactively embrace technology



Digital Mindset

Curiosity, adaptability, and lifelong learning/reskilling are essential



Collaborative Ecosystem

Universities, industry, and government must work together



Next Steps



Educational Reform

Integrate digital skills and micro-credentials across the curriculum



Industry Partnerships

Create internship programs



Skill Development

Support continuous reskilling for students, alumni and mid-career workers.

"Digital skills are the gateway to prosperity in the future labor market"

UNITEN ALUMNI BACK TO CLASS (ABC)

Universiti Tenaga Nasional



**AI VENTURES - BUILDING AND SCALING
IN DIGITAL BUSINESS**

DATE : 05 DECEMBER 2025
TIME : 3.00 PM
VENUE : BM-0-011

Sharifah Azuani bt Dato Sayed Mohd Ali
Co-founder and Marketing Director
Laman Teknologi Sdn.Bhd

Guest Speaker

SCAN FOR SCORUN



 Uniten.Alumni  www.uniten.edu.my

UNITEN ALUMNI BACK TO CLASS (ABC)

Universiti Tenaga Nasional



**INDUSTRY GUEST SPEAKER FOR ELBB 233
(ENERGY LITERACY)**

DATE : 07 AUGUST 2025
TIME : 2.30 PM – 4.00 PM
VENUE : BV1 THEATER, COE UNITEN



Ms. Suraya Ilana Binti Mohd Yahaya
Senior Manager (Strategy Alignment TNB)

Guest Speaker

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UNITEN ALUMNI BACK TO CLASS (ABC)

Universiti Tenaga Nasional




**INDUSTRY GUEST SPEAKER FOR CGEB 4112
(ENERGY AND COMPUTING)**

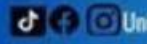

DATE : 23 JULY 2025
TIME : 6.00 PM – 7.00 PM
VENUE : AUDITORIUM LIBRARY(IRC)
UNITEN

**Ir. Ts. WAN HASWAZER
BIN WAN MAHMUD**
Manager, TNB Renewables

Guest Speaker

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UNITEN INITIATIVES TO BUILD FUTURE DIGITAL SKILLS

Comprehensive strategic approach to develop digital competencies and AI literacy



New AI & Data Programmes

- ✓ BCS (Artificial Intelligence)
- ✓ Master of AI & Master of Data Science
- ✓ Designed with strong industry input



Cross-College AI & Data Electives

- ✓ AI, data analytics modules as electives
- ✓ Available to students from all colleges
- ✓ Builds AI literacy beyond computing



Industry & Alumni Back to Class

- ✓ Regular guest lectures and sharing sessions
- ✓ Industry experts from AI ventures
- ✓ Digital business and energy & computing



Embedding Digital Tools in Courses

- ✓ Core and elective subjects using digital tools
- ✓ Real datasets and analytics implementation
- ✓ Python, Power BI, Tableau integration
- ✓ Practical, hands-on learning approach



Micro-Credentials & Lifelong Learning

- ✓ Short courses in AI and digital skills
- ✓ For students, staff and professionals
- ✓ Supports continuous reskilling

DIGITAL SKILLS REQUIRED IN THE FUTURE LABOUR MARKET



CREATIVITY



**DATA
ANALYSIS**



COMMUNICATION



ADAPTABILITY

Thank You



KHAIRUL SALLEH BIN MOHAMED SAHARI, PhD, FASc
e-mail: vc@uniten.edu.my

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