

IEM Engineering Impact Survey

Report on

Engineering Workforce Readiness for Malaysia's Digital Infrastructure Economy

Prepared by
The Institution of Engineers, Malaysia (IEM)

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Executive Summary

In the Malaysian context, the Digital Infrastructure Economy refers to the broader ecosystem that develops, operates and supports the infrastructure and technologies underpinning the country's digital activities. It includes data centres, telecommunications and connectivity networks, cloud computing, cybersecurity and related digital services, together with enabling sectors such as semiconductors, advanced packaging, electrical and electronics, energy and engineering services. These interconnected industries provide the physical and technological foundation for Malaysia's growing digital economy.

Malaysia is progressing towards becoming a higher-value digital and technology-driven economy. As the country works towards its 2030 technology ambitions, significant investments are being made in areas such as data centres, semiconductors and other forms of digital infrastructure.

These developments present important opportunities for Malaysia and the engineering profession. At the same time, the findings of this survey suggest that further attention is needed to ensure that the engineering workforce is sufficiently prepared to support this transition.

The survey highlights several areas that may require greater focus, including digital skills, salary competitiveness, talent retention and opportunities for engineers to gain practical experience in emerging technologies.

Key Areas to Consider

Growing Digital Investment

Malaysia is attracting substantial investment in digital infrastructure, including a pipeline of new data centre developments. The semiconductor sector is also moving towards higher-value activities such as Integrated Circuit (IC) design and advanced packaging.

Workforce Considerations

At the workforce level, there remain concerns about salaries, skills development and employment opportunities. Previous findings indicate that 35% of junior engineers earn below RM2,000 per month, while the skill-related underemployment rate stands at 32.2%.

These findings suggest that Malaysia's continued digital growth should be accompanied by efforts to strengthen the engineering workforce and ensure that engineers are able to participate meaningfully in emerging industries.

Key Survey Findings

Area	Survey Finding	What It May Mean
Talent Retention	38.76% are considering leaving or are unsure about staying	Greater attention may be needed to retain experienced engineering talent.
Salary Competitiveness	63.57% believe engineering salaries are not competitive	Competitive remuneration may be important in attracting and retaining engineering talent.
Workforce Preparedness	49.61% feel "Not Prepared" or "Slightly Prepared" for digital infrastructure	More training and practical exposure may help engineers prepare for emerging projects.
Digital Skills	All emerging technology areas were rated below the "Moderate" proficiency level	There is considerable room to strengthen digital capabilities across the profession.
Small-Firm Capacity	37.21% work in organisations with fewer than 50 employees	Smaller firms may require additional support and resources to adopt new technologies.

Overall, the findings provide useful insights into areas where industry, government, academia and professional institutions can work together to strengthen Malaysia's engineering workforce.

1.0 Introduction: Malaysia's Emerging Digital Infrastructure Landscape

Malaysia is experiencing significant growth in digital infrastructure, particularly through the development of data centres in Johor, Selangor and Negeri Sembilan.

At the same time, the semiconductor industry is increasingly moving beyond traditional assembly and testing towards higher-value activities such as advanced packaging and IC design. These developments are changing the skills required of engineers.

To maximise the benefits of these investments, Malaysia will need engineers who are not only strong in traditional engineering fundamentals but are also comfortable working with new technologies and digital systems.

Workforce-related challenges also need to be considered. With 35% of junior engineers earning below RM2,000 and a skill-related underemployment rate of 32.2%, as reported in *Berita Harian* with the title of “Jurutera Miskin”, improving career prospects and professional development will be important in maintaining engineering as an attractive and sustainable profession.

According to IEM's 2025 position paper, *Engineers' Salaries from Consulting Engineers' Perspectives: Solutions and Proposals*, the percentage of junior engineers earning below RM2,000 has declined to 18%. While this improvement is encouraging, the continued presence of low salaries within the engineering profession remains a concern. This highlights the importance of ongoing efforts to improve remuneration and ensure that engineering continues to be an attractive and sustainable career.

To provide a clearer context, the global semiconductor industry is accelerating towards an estimated USD 1 trillion market by 2030, driven by artificial intelligence (AI), electrification and advanced computing. This growth is closely linked to the expansion of the digital infrastructure economy, as semiconductors underpin many of the technologies used in data centres, AI computing, telecommunications, cloud infrastructure and increasingly automated industrial systems.

In conjunction with SEMICON Southeast Asia 2026, the Malaysian Investment Development Authority (MIDA) highlighted Malaysia's strategic evolution beyond traditional assembly, testing and packaging activities towards higher-value segments, including Integrated Circuit (IC) design, advanced packaging and smart manufacturing. Malaysia's Electrical and Electronics (E&E) sector secured RM28.5 billion in approved investments in 2025. MIDA also emphasised that capturing greater long-term value requires a workforce capable of supporting increasingly advanced technologies, including digital twin systems, AI-enabled production and real-time data analytics.

This industrial transformation provides an important context for assessing Malaysia's engineering workforce readiness. MIDA Chief Executive Officer Datuk Sikh Shamsul Ibrahim Sikh Abdul Majid highlighted the importance of the “integration of talent development with technology adoption” and raised the question, “*How do we move faster, together, on talent?*” National initiatives, including the Special Taskforce-Talent Facilitation (STF-TF), the Arm-

Malaysia IC design partnership and the MRI3 programme, reflect ongoing efforts to better align workforce development with evolving industry requirements. Nevertheless, there remains a need to understand the current capabilities, practical readiness and employment conditions of the engineering workforce.

Against this background, The Institution of Engineers, Malaysia (IEM) conducted the IEM Engineering Impact Survey in August 2026 to provide an industry-based assessment of engineering workforce readiness. The study examines current digital skill proficiency, practical troubleshooting readiness, salary competitiveness and talent retention across the engineering profession, providing insights into Malaysia's capacity to support the continued development of its digital infrastructure economy and related technology-intensive sectors.

2.0 Respondent Profile: Understanding the Engineering Workforce

A total of 129 respondents participated in the survey.

The respondents represent a relatively experienced group of engineering professionals. This provides useful insight into how established members of the profession view their readiness for the changing technological environment.

Engineering Discipline

Engineering Discipline	% of Responses
Civil Engineering	43.41%
Mechanical Engineering	20.16%
Electrical Engineering	17.83%
Computer / Software Engineering	6.98%
Other disciplines, including Electronic and Chemical Engineering	5.43%

Civil Engineering represents the largest group of respondents, followed by Mechanical and Electrical Engineering.

Primary Industry Sector

Industry Sector	% of Responses
Engineering Consultancy	34.11%
Utilities & Energy	17.05%
Construction	15.50%
Manufacturing	8.53%
Data Centres	8.53%
Other sectors, including Government and Semiconductor	16.28%

Location and Organisation Size

Respondents are mainly based in the central region, particularly Selangor (37.98%) and Kuala Lumpur (27.91%), followed by Sarawak (12.40%).

In terms of organisation size, 37.21% of respondents work in organisations with fewer than 50 employees.

This is an important consideration because smaller engineering firms may have fewer financial and technical resources available for research, digitalisation and staff training.

Experience of Respondents

The survey respondents are highly experienced, with 82.94% having 11 or more years of engineering experience:

- 34.88% have between 11 and 20 years of experience; and
- 48.06% have more than 20 years of experience.

The strong representation of senior engineers is valuable because these professionals often play an important role in mentoring younger engineers and leading engineering organisations.

Their responses also indicate an opportunity to provide experienced engineers with greater exposure to emerging digital technologies so that their extensive engineering knowledge can be combined with new digital capabilities.

3.0 Digital Proficiency: Opportunities to Strengthen Emerging Technology Skills

Respondents were asked to rate their proficiency in seven technology areas using a scale of 1 to 5.

The results were as follows:

Skill Area	Weighted Average	Proficiency Level
Artificial Intelligence (AI)	2.90	Sub-Moderate
Data Analytics	2.65	Low-Moderate
Cloud Computing	2.52	Low-Moderate
Industrial Internet of Things (IoT)	2.46	Low-Moderate
Cybersecurity	2.38	Low
Automation and Robotics	2.31	Low
Digital Twins	2.18	Very Low

Understanding the Findings

None of the seven areas reached the “Moderate” proficiency level of 3.0.

Artificial Intelligence recorded the highest score at 2.90, suggesting that engineers may already have some familiarity with AI.

Digital Twins (2.18) and Automation and Robotics (2.31) recorded the lowest scores.

These findings should be viewed as an opportunity to identify areas for future training and professional development.

Technologies such as Digital Twins, automation, AI and data analytics are becoming increasingly relevant in modern infrastructure, manufacturing, data centres and other engineering environments.

Providing engineers with greater access to practical training in these areas could help Malaysia develop more local expertise and increase participation in higher-value technical activities.

4.0 Workforce Readiness and Troubleshooting Confidence

Being prepared for digital infrastructure projects involves more than understanding technology in theory. Engineers also need practical experience and confidence in identifying and resolving technical problems.

The survey identified three areas worth noting:

Project Exposure

39.53% of respondents reported having no involvement in digital infrastructure projects such as data centres, smart cities or renewable energy projects.

Preparedness

49.61% indicated that they felt either “Not Prepared” or “Slightly Prepared” for large-scale digital infrastructure projects.

Troubleshooting Confidence

48.07% indicated that they were either “Not Confident” or “Slightly Confident” in independently diagnosing and resolving technical issues in automated systems.

These findings suggest that greater hands-on exposure could complement existing engineering experience.

Industry placements, practical workshops, project-based training and collaboration with technology providers could provide engineers with more opportunities to work directly with modern digital systems.

5.0 Looking Towards 2030: Skills for the Future

Respondents were also asked which skills they believe will be important for engineers in the coming years.

The leading areas identified were:

- **Artificial Intelligence – 73.64%**
- **Sustainability & ESG – 36.43%**
- **Data Analytics – 33.33%**
- **Communication – 31.01%**

Artificial Intelligence clearly stands out as the most widely recognised future skill.

The findings also show that respondents recognise the importance of sustainability, data analytics and communication.

Interestingly, Semiconductor Design was selected by 6.98% of respondents.

Given Malaysia's growing ambitions in higher-value semiconductor activities, this may indicate an opportunity to create greater awareness of specialised semiconductor skills and their potential career opportunities.

Technical and communication skills should be viewed as complementary. Engineers increasingly need both strong technical knowledge and the ability to communicate complex ideas effectively to colleagues, clients, policymakers and the public.

6.0 Career Sustainability: Salary, Retention and Talent Development

Malaysia's ability to develop a strong engineering workforce also depends on whether engineering remains an attractive and sustainable career.

Talent Retention

The survey indicates that approximately 39% of respondents may represent a potential retention concern:

- 13.18% indicated that they intend to leave; and
- 25.58% were unsure whether they would stay.

While this does not necessarily mean that all these engineers will leave the profession or the country, it highlights the importance of understanding the factors influencing their career decisions.

Salary Competitiveness

A total of 63.57% of respondents disagreed or strongly disagreed that engineering salaries are competitive.

"Salary and Benefits" was also identified as the main reason for considering leaving, selected by 21.71% of respondents.

These findings suggest that remuneration remains an important consideration in attracting and retaining engineering professionals.

Outlook Towards 2030

Some 54.26% of respondents do not believe Malaysia is currently on track to develop sufficient talent to support its technology ambitions.

Rather than viewing this finding solely as a negative assessment, it can serve as an important signal for stakeholders to strengthen education, professional development, remuneration and industry opportunities.

7.0 Recommendations: Strengthening Malaysia's Engineering Workforce

The 77 open-ended responses received through the survey provide useful suggestions on how Malaysia can better prepare its engineers for the future.

Based on these responses, four broad areas are proposed for consideration.

A. Modernising Engineering Education

Engineering education should continue to evolve alongside changes in technology and industry.

Possible measures include:

- incorporating AI, cybersecurity and data analytics more widely into engineering programmes;
- providing students with greater exposure to practical industry projects;
- encouraging innovation, creativity and prototyping; and
- strengthening collaboration between universities and industry.

The aim should be to ensure that graduates have both strong engineering fundamentals and practical exposure to technologies used in the workplace.

B. Moving Towards Practical, Skills-Based Professional Development

Continuing Professional Development (CPD) plays an important role in keeping engineers informed of new developments.

There may also be opportunities to complement conventional seminars and webinars with more practical and assessment-based learning.

For example, assessed microcredentials could allow engineers to demonstrate their ability to apply what they have learned.

Practical outputs could include:

- developing simple AI applications or prototypes;
- preparing Building Information Modelling (BIM) models;
- developing Digital Twin applications; and
- carrying out cybersecurity risk assessments.

This approach could help shift professional development from awareness-based learning towards demonstrated practical capability.

C. Strengthening the Economic Sustainability of Engineering Careers

The long-term development of engineering talent is closely linked to the economic sustainability of the profession.

Stakeholders may wish to consider measures that ensure engineering services are appropriately valued and that remuneration reflects engineers' qualifications, responsibilities and professional expertise.

Possible areas for consideration include:

- reviewing the application of appropriate scales of fees in government procurement;
- reviewing relevant man-month remuneration rates; and
- supporting initiatives such as the Progressive Salary Policy where appropriate.

Improving career and salary prospects may also help attract talented young people into engineering and encourage experienced professionals to remain in the profession.

D. Strengthening Local Capability and Engineering Leadership

Large-scale infrastructure and technology projects provide valuable opportunities for Malaysian engineers and engineering firms to develop new capabilities.

Where appropriate, procurement and project arrangements could encourage meaningful participation by local engineering firms and provide opportunities for structured knowledge transfer from international partners.

At the same time, the profession should continue to encourage a culture in which engineering decisions are guided by technical knowledge, professional ethics, public safety and sound professional judgement.

Engineers should be supported in providing independent professional advice, particularly where public safety and technical integrity are concerned.

8.0 Conclusion: Moving Forward Together

Malaysia's growth in data centres, semiconductors and digital infrastructure presents significant opportunities for the engineering profession.

The survey findings indicate that there are areas requiring further attention, particularly in digital skills, practical exposure, salary competitiveness and talent retention.

At the same time, Malaysia has a strong foundation of experienced engineering professionals who can contribute significantly to the country's digital transformation.

The way forward therefore requires a coordinated effort involving government, industry, academia, professional institutions such as IEM and engineers themselves.

By strengthening digital skills, expanding practical training opportunities, improving career prospects and encouraging greater collaboration between local and international industry players, Malaysia can better prepare its engineering workforce for the opportunities ahead.

The transition towards 2030 should not only be about adopting new technologies. It should also be about ensuring that Malaysian engineers are equipped, valued and given meaningful opportunities to contribute to the country's future development.

THE READINESS CHALLENGE

ENGINEERING WORKFORCE READINESS FOR MALAYSIA'S DIGITAL INFRASTRUCTURE ECONOMY

IEM SURVEY OF 129 EXPERIENCED ENGINEERS REVEALS SIGNIFICANT READINESS GAP. LOW PROFICIENCY AND UNCOMPETITIVE SALARIES THREATEN 2030 GOAL OF 60,000 SKILLED ENGINEERS.

STRATEGIC ROADMAP TO 2030

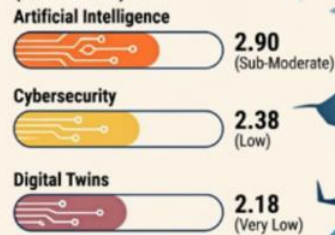
63.57%
SEE SALARIES AS UNCOMPETITIVE

Remuneration is the primary driver for engineers considering leaving the profession or country.

49.61%
FEEL UNPREPARED FOR DIGITAL INFRASTRUCTURE

Nearly half of respondents lack confidence for large-scale projects like data centers.

LOW PROFICIENCY LEVELS (SCORE 1-5)



38.76%
ATTRITION RISK

Over a third of the workforce is unsure about staying or intends to leave.



AI IDENTIFIED AS TOP FUTURE SKILL

73.64% of engineers recognize AI as the most critical skill for future success.



TRANSITION TO PRACTICAL MICROCREDENTIALS

Shift from awareness-based webinars to assessed, hands-on digital applications and prototyping.



STRENGTHENING ECONOMIC SUSTAINABILITY

Reviewing government procurement fee scales to ensure remuneration reflects professional expertise.