July 2021

Responsible AI

Building artificial intelligence (AI) trust in line with the National Fourth Industrial Revolution (4IR) Policy

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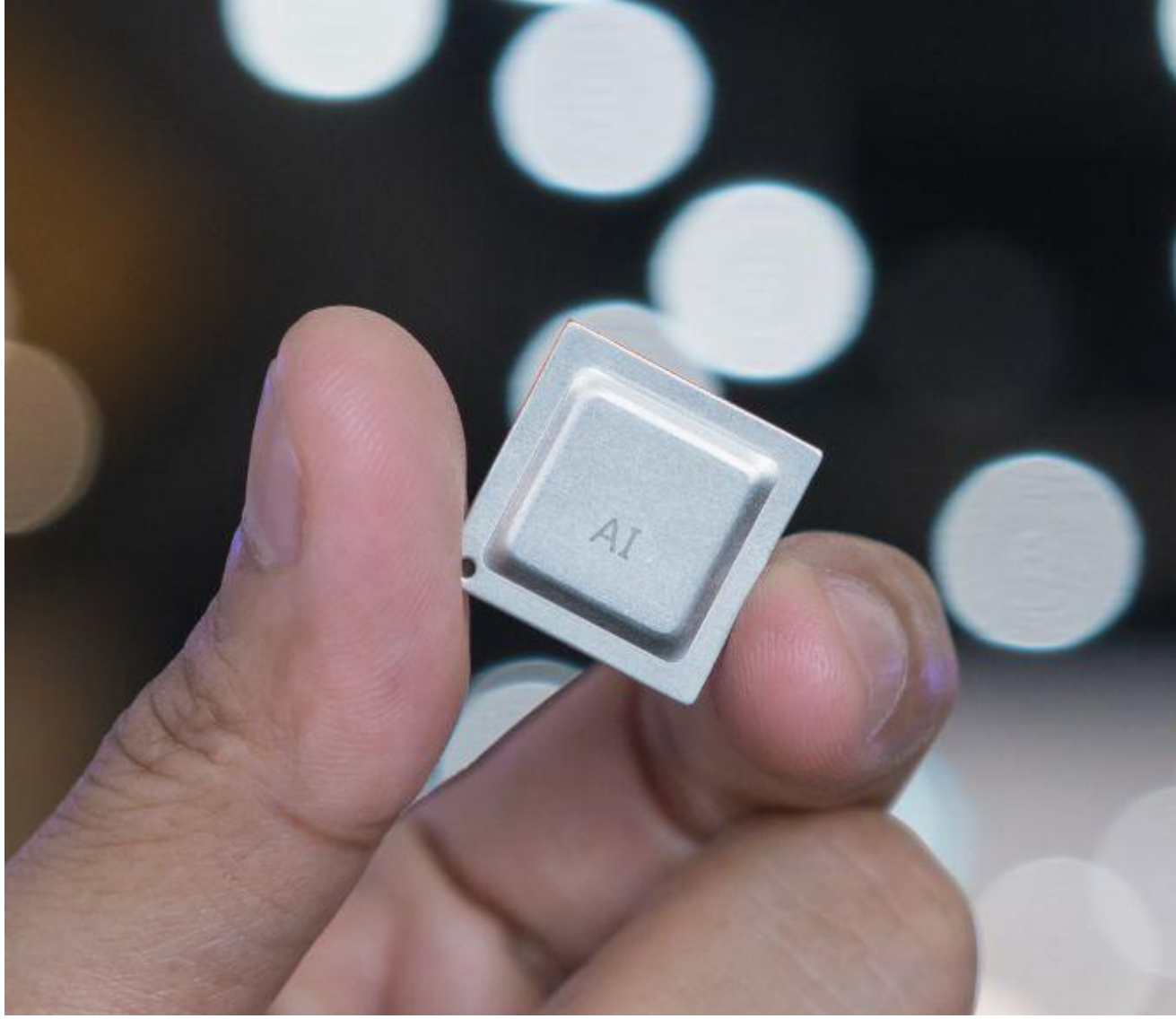

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“In today’s increasingly transparent, fast-moving and competitive marketplaces, implementing Responsible AI is not merely a nice-to-have, but a prerequisite for success.

Put simply, if AI isn’t responsible, it isn’t truly intelligent. Companies must bear this in mind as they plan and build their AI-enabled future.”

A practical guide to Responsible Artificial Intelligence (AI), PwC, 2019

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Overview

Artificial intelligence (AI) can bring many benefits (e.g. it can automate tasks, manage cybersecurity threats). But there are also risks associated with the technology if it's not used responsibly (e.g. it may promote bias).

The benefits

AI, a foundational 4IR technology

AI is one of the five foundational 4IR technologies in the government's National Fourth Industrial Revolution (4IR) Policy.

AI is a game changer

Could contribute up to US$15.7 trillion to the global economy in 2030, more than the current output of China and India combined.

It can reinvent business models

Could step up the pace of product innovation, shape strategies, and boost supply chain effectiveness.

The risks

The dark side of AI

Growing public concern over issues such as bias in algorithms or facial recognition tools, self-driving cars, and AI-powered 'deepfakes'.

Increased regulatory scrutiny

Regulators are responding to concerns, looking into the development of frameworks to guide the ethical use of AI.

Lack of progress in addressing AI risks

In PwC's 2021 AI Predictions survey, only about one-third of respondents plan to tackle AI-related risks.

Our Responsible AI framework can help organisations capitalise on the competitive advantages of AI in a way that builds stakeholder trust.

Need to make AI responsible - right now

AI keeps learning and changing itself. It's a complex technology that many executives, including risk officers and even IT experts, don't yet fully understand.

Risk frameworks can help

By embedding a proper risk framework (Responsible AI) within the AI lifecycle (from strategy, performance, security to controls), organisations can make more responsible decisions.

Getting AI right

Key steps to build greater trust in AI

- **Take a multidisciplinary approach** - Include leadership,compliance, human resources, tech and data experts, and owners from different functions
- **Build up your AI risk confidence** - Have the right AI policies, standards, controls, tests, and monitoring for all risk aspects of AI
- **Act to maintain performance** - Good governance and risk management don't have to mean slow going. It's possible to automate many governance processes and risk rating for human review.

PwC's Responsible AI Toolkit

Helps organisations in their AI journey - Flexible and scalable suite of capabilities, covering frameworks and leading practices, assessments, technology, and people.

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Introduction

Getting ready for 4IR with AI

4IR technologies are fundamentally changing the way companies do business. In the government's National Fourth Industrial Revolution (4IR) Policy, artificial intelligence (AI) has been identified as one of the 5 foundational 4IR technologies, that comes not only with great potential, but also great risks.

From consumers to manufacturers to cities, 4IR advancements are more accessible and less costly than just a few years ago, ushering in a revolution of experience. For businesses, the timing couldn't be better, 4IR can open opportunities for growth even during economic downturns through greater productivity and efficiencies.

Following the release of the Malaysia Digital Economy Blueprint in February this year, the government has just recently launched the National Fourth Industrial Revolution (4IR) Policy, doubling down on their commitment to create an ecosystem in the country where technology is widely adopted.

To learn more about the Policy highlights and our perspectives on how businesses can play a role in seeing the strategies come to fruition, refer to our Policy highlights section in the next three pages.

Capitalising on AI

Our research estimates that AI could contribute $15.7 trillion to the global economy by 2030, as a result of productivity gains and increased consumer demand driven by AI-enhanced products and services.

More and more, we see AI solutions impacting everything from customer service and sales to back office automation. In fact, PwC's 2021 AI Predictions survey found that 86% of respondents believe that AI will be a "mainstream technology" at their company in 2021.

The government recognises the importance of AI adoption in sharpening the country's competitive edge, noting that AI is expected to create the most impact out of all other technologies, permeating all industries and playing an increasing role in our daily lives. It's no surprise then, that AI has been classified under the National Fourth Industrial Revolution (4IR) Policy as a foundational technology where there will be greater focus on the development of its capabilities.

AI benefits come not without risks

But amid the promise of AI, the significant scale of change resulting from AI systems and increasingly pervasive human/machine interactions are giving rise to concerns amongst consumers and business leaders. For instance, algorithms can help make decisions, but are they free of bias? Other pertinent questions to think about: Is your data stored securely? And are you able to articulate how AI systems work in order to strengthen trust with your stakeholders?

Even when adopted with the best of intentions, AI-powered solutions can be misapplied, yielding negative consequences for individuals, organisations, and society. Therefore, there is a clear need for those in the C-suite to review the AI practices within their organisations, and ensure that there is a robust enough framework in place to mitigate AI's potential risks. This thought leadership publication further explores what some of these risks are, and provides insights on how organisations can harness the power of AI in an ethical and responsible manner - from strategy through execution.

Key highlights from the National Fourth Industrial Revolution (4IR) Policy

Purpose of the National Fourth Industrial Revolution (4IR) Policy

The rapid advancement of disruptive technologies brought on by 4IR is transforming the economic landscape around the world, with COVID-19 accelerating this wave of change.

In the coming decade, past recipes for economic and business success will no longer be effective. A new set of capabilities, infrastructure, and ecosystem will need to be developed so that Malaysia can stand on equal footing with the rest of the world as a digitalised nation.

With this in mind, the National Fourth Industrial Revolution (4IR) Policy aims to:

- Drive coherence in transforming[1] the country's socioeconomic development.
- Guide the ethical use of 4IR technologies.
- Outline the key focus areas that impact the rakyat, businesses and government, in order to seize growth opportunities and to address the potential risks arising from 4IR.

Why it's important for Malaysia

As 4IR technologies present Malaysia with both new and promising opportunities yet also risks, the National Fourth Industrial Revolution (4IR) Policy is needed to provide:

- Key guiding principles and strategic direction to ministries and agencies to formulate policies and action plans, optimise resource allocation and coordinate the implementation of emerging technologies.
- Guidelines to address risks from 4IR technologies (e.g. irresponsible use and manipulation of technology, risk to labour market, widening inequality and deterioration of value and ethics) whilst preserving values and culture

[1] It supports the Twelfth Malaysia Plan (RMKe-12) and Wawasan Kemakmuran Bersama 2030 (WKB 2030), and complements the Malaysia Digital Economy Blueprint

The National Fourth Industrial Revolution (4IR) Policy Framework

The framework is underpinned by a top-down approach that outlines the vision and missions of the Policy, as well as the strategies and initiatives that would help drive greater adoption of emerging technologies. It covers various stakeholders (businesses, society and government),10 key sectors and five foundational technologies.

Vision	Balanced, responsible and sustainable growth				
3 missions	Improve quality of life by leveraging technological advancement	Enhance local capabilities to embrace 4IR across sectors	Harness technologies to enhance the preservation of ecological integrity		
3 objectives	Seize growth opportunities arising from the 4IR	Create a conducive ecosystem to cope with the 4IR	Build trust in an inclusive digital society		
4 policy thrusts	Equip the rakyat with 4IR knowledge and skill sets	Forge a connected nation through digital infrastructure development			
	Future-proof regulations to be agile with technological changes	Accelerate 4IR technology innovation and adoption			
5 foundational technologies	Artificial intelligence	Internet of things	Blockchain	Advanced materials and technologies	Cloud computing and big data analytics

Source: The National Fourth Industrial Revolution (4IR) Policy

What the Policy means for businesses

Key opportunities and benefits of adopting 4IR

To create new socioeconomic growth opportunities for the economy, the National Fourth Industrial Revolution (4IR) Policy will focus on 10 key sectors, and six supporting sectors.

The application of 4IR technologies in these sectors is expected to create the following new opportunities:

- Introduction of new products and services as well as 4IR-enabled business models through 4IR technologies
- Integration with the global value chain
- Enhanced capacity and capability to reap new markets domestically and globally
- Creation of new high value-added jobs
- Reduction in over-reliance on low-skilled foreign labour

Businesses can potentially benefit from productivity gains and new investment opportunities, as the National Fourth Industrial Revolution (4IR) Policy states that it intends to achieve the following productivity and investment outcomes by 2030:

- 30% uplift in productivity across all sectors, compared to 2020 levels
- Achieve 3.5% gross expenditure on R&D (GERD) to GDP
- Increase investments in 4IR-enabling infrastructure, and the number of home-grown 4IR technology providers.

Source: The National Fourth Industrial Revolution (4IR) Policy

The Policy's key focus sectors

Sectors focus with potential integration with the global value chain


Transportation and logistics


Manufacturing


Healthcare

Sectors supporting socio-economic needs


Education


Agriculture


Utilities

Sectors that drive technology adoption


Finance and insurance


Professional, scientific and technical services


Wholesale and retail trade


Tourism

Supporting sectors


Construction


Arts, entertainment and recreation services


Real estate


Mining and quarrying


Information and communications services


Administrative and support services

How the private sector can contribute to the Policy's success

For the adoption of 4IR technologies to gain traction, the public and private sectors cannot work in silos. A collaborative approach will be required to create an ecosystem that supports the growth of 4IR technologies.

Some of the ways the private sector can play a pivotal role, as outlined in the National Fourth Industrial Revolution (4IR) Policy, is by taking the lead in several of its initiatives. This may include:

- Developing innovative businesses, functions, processes and infrastructure to address economic, social and environmental challenges.
- Co-creating and collaborating in new partnership models by leveraging 4IR platforms, ecosystems and digital marketplaces.
- Investing in innovation, and adopting digital solutions

Diving deeper, as the Policy is centred around four thrusts which guide its strategies and initiatives, the focus areas for collaboration should follow suit. Below, we've identified some potential areas for immediate public-private partnerships.

PHASE 1: Completion by 2022 - Enhance 4IR awareness and adoption

Thrust 1: Equip the rakyat with 4IR knowledge and skill sets

- Initiative 1: Establish industry-led, sectoral-based 4IR-skills development centres
- Initiative 2: Incentivise industry to upskill and reskill talent in 4IR areas
- Initiative 3: Establish an AI-enabled data platform to facilitate human capital planning
- Initiative 9: Provide incentives to minimise the risk of job displacements

Thrust 3: Future-proof regulations to be agile with technological changes

- Initiative 19: Adopt agile regulatory approach to meet the needs of the digital economy businesses

Thrust 4: Accelerate 4IR technology innovation and adoption

- Initiative 26: Allow real-time matching, provide coordinated support and facilitation to accelerate innovation and scaling of 4IR technologies among businesses, including MSMEs and entrepreneurs
- Initiative 27: Incentivise 4IR technology applications for business improvement (performance-linked incentives)
- Initiative 28: Mobilise co-investment fund for 4IR technology adoption by industries

Source: The National Fourth Industrial Revolution (4IR) Policy

What needs to be considered when executing the Policy's initiatives

- Putting people first

  The National Fourth Industrial Revolution (4IR) Policy adopts a human-centric approach that balances the need for achieving technology advancement, solving social problems, and safeguarding the moral and cultural values of society.

  This is a welcome move, because people need to be at the heart of any digital transformation initiative, as success often rests with them. If they don't buy in to changes, it's almost impossible for new technologies and processes to live up to expectations. One way that organisations can put people first, is by upskilling or reskilling their workforce, equipping them with a deeper understanding of how new technologies are impacting the way they work, and the digital skills they'll need to effectively use those technologies.

- Using technology for good

  The National Fourth Industrial Revolution (4IR) Policy advocates the use of technology for good to boost Malaysia's social, economic and environmental health. For organisations, this signals the need to rethink their Environmental, Social, and Governance (ESG) commitments. AI will be a game-changer in this regard, as they have the capabilities to support sustainable practices. For example, they can be used to monitor and predict air pollution levels or enable energy to be used efficiently in buildings.

  Sustainability is a key point in the National Fourth Industrial Revolution (4IR) Policy, and among the outcomes they aim to achieve by 2030 are:

  - A reduction in greenhouse gas emissions intensity by 45%
  - An improvement in Malaysia's ranking in the Environmental Performance Index (from 68 to top 50)

  The Policy has also introduced several strategies that look at future-proofing regulations in response to technological changes. They include:

  - Safeguarding society from irresponsible use of technology i.e. through the introduction of an ethics framework for technological development, deployment and utilisation
  - Updating the legal framework governing personal data management and cyber security to build trust in society

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The positive impact of AI

Big prize, big impact

Why AI matters - the economic benefits

AI touches almost every aspect of our lives and is influencing business decisions that organisations make. And it's only just getting started. According to our analysis, global GDP could potentially be up to 14% higher in 2030* as a result of the accelerating development and take-up of AI.

In the near-term, the biggest potential economic uplift from AI is likely to come from improved productivity e.g. automation of routine tasks, augmenting employees' capabilities and freeing them up to focus on higher value-adding work.

Eventually, product enhancements and subsequent shifts in consumer demand, behaviour and consumption emanating from AI will result in the GDP uplift overtaking the productivity gains.

The impact of AI on the global economy

Potentially

14%

higher GDP by 2030*

Time saved: productivity gains from automating processes

Labour productivity: productivity gains from augmenting existing labour force with AI

Personalisation: increased demand from personalised higher-quality AI-enhanced products.

Source: PwC Sizing the prize

** GDP gains over the period of 2017-2030*

AI could speed up Malaysia's innovation rate

In Malaysia, AI has the power to nearly double (x1.8) the country's innovation rate, as well as improve employee productivity by 60%, according to a survey conducted by Microsoft and IDC.

Yet, many are still not taking full advantage of AI's potential, with only 26% of Malaysian organisations having embarked on their AI journeys. With the government's National Fourth Industrial Revolution (4IR) Policy laying the foundation to enhance our country's 4IR capabilities, there's no better time than now for Malaysia to sprint to the front of the race.

Unlocking the potential of AI would enable organisations to better rethink their plans for transformation, reconfigure their operating models for lasting competitive advantage, and capitalise on the digital marketplace. This would ultimately support Malaysia in our ongoing efforts to rebuild and emerge stronger from the COVID-19 pandemic.

Impact and adoption of AI in Malaysia

1.8x

innovation rate

60%

productivity increase with AI adoption

Only **26%** of

Malaysian businesses have embarked on AI journeys

Source: Microsoft and IDC, Future Ready Business: Assessing Asia Pacific's Growth Potential Through AI, as cited in Digital News Asia, Microsoft

More AI, more benefits

AI use cases

There are many ways AI can be deployed. It can be used to automate tasks such as detecting fraud or vetting resumés and loan applications. It could also be applied to addressing simple customer queries, for example, via a channel we're all familiar with: chatbots. The strategic use of AI would depend on an organisation's priorities, but based on our AI Predictions survey, the following use cases have been cited as important in 2021.

Top-ranked AI applications for 2021

#1 Managing risk, fraud and cybersecurity threats

#2 Improving AI ethics, explainability and bias detection

#3 Helping employees make better decisions

#4 Analysing scenarios using simulation modeling

#5 Automating routine tasks

Source: PwC 2021 AI Predictions: The model is never done

AI investments will increase

COVID-19 has increased the uptake of AI technologies. In our 2021 AI Predictions survey, 52% of respondents said that they have accelerated their AI approach in the wake of the COVID-19 crisis. Meanwhile, 86% said that AI will be a "mainstream technology" at their company in 2021.

Indeed, stronger adoption and investments in AI could very well set the stage for improved performance in a post-pandemic world. As our survey showed, those who increased their AI investments in areas like workforce planning, simulation modeling and supply chain resilience, to name a few, also reported that the investment resulted in positive impact.

With benefits ranging from revenue growth to better decisions and improved customer experiences, the payoff is clear, giving early adopters an edge that would be difficult for their competitors to overtake.

Respondents who say that they are currently realising the benefits of AI investments in this area

AI benefits	All companies	Companies that have fully embraced AI
Create better customer experiences	67%	86%
Improve decision-making	54%	75%
Innovate our products and services	53%	75%
Achieve cost savings	50%	70%
Operate more efficiently/ increase productivity	52%	64%

Source: PwC 2021 AI Predictions: No uncertainty here

Sector-level adoption of AI

AI use cases across industries

Given the demand uncertainty in many sectors due to the pandemic, there is renewed focus on AI and how it can be harnessed to improve customer experience, facilitate more accurate segmentation and targeting, and empower the workforce, among other transformation initiatives.

Despite its promise, implementing and scaling AI poses its own set of challenges. From our publication AI: An opportunity amidst a crisis, we studied multiple parameters across selected industries to understand their objectives with respect to AI adoption. The findings have been summarised in the table below.

Looking at our local business landscape where adoption is still growing, we believe that organisations in Malaysia are facing similar challenges. Where people-related challenges are involved, this is where upskilling plays a significant role. Because for AI to be deployed responsibly, one must first acknowledge that it's people who build AI's underlying models and who feed the machines with the data that eventually trains them. Hence, while investment in the tools are needed, organisations also need to see to it that employee training isn't overlooked.

AI industry outlook

	Telecom, media & tech	Financial services	Healthcare and pharma	Retail consumer	Industrial products
Top current use case	Network threat identification and prevention	AI-augmented customer service chatbots	Clinical trial and drug discovery	Hyper-personalising customer experience	Improving productivity in operations using intelligent automation
Top future use case	Improving recruitment and onboarding new employees	Fraud detection and anti-money laundering	Determine prototype feasibility	AI-augmented customer service chatbots	Improving asset performance using predictive maintenance
Top challenge	Identifying right use cases for AI	Availability of high-quality data for AI use	Scaling pilots to production	Measure AI's return on investment	Training current employees to work with AI systems
AI investment focus	Recruiting and developing technical talent to build AI solutions	Improving data quality and external data partnerships	Implementing AI technologies and platforms	Identifying more AI opportunities	Change management (adopting new ways of working)

Source: PwC AI: An opportunity amidst a crisis,

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Risks inherent in AI

With great potential comes great risks

Trust and accountability are critical in AI

AI is still at a very early stage of development overall. While there are opportunities on one hand, on the other are risks that need to be managed.

Take autonomous vehicles for example, AI requires people to trust their lives to a machine – that's a huge leap of faith for both passengers and public policymakers. Anything that goes wrong, be it a malfunction or a crash, is headline news.

Such risks apply to all forms of AI, not just autonomous vehicles. Customer engagement robots have been known to acquire gender or racial biases through training or even manipulation, for example. From an ethical standpoint, there are also concerns around facial recognition technology, whether its use could potentially violate privacy and human rights.

To build trust, organisations need to recognise that there are risks associated with AI that could harm society if the appropriate measures aren't taken to mitigate them (see diagram on the right). Armed with awareness and a more in-depth understanding of what they could face, organisations will then be better equipped to incorporate the required considerations into their machines' design - with responsibility at its centre.

Rise in AI risks driven by:

- More AI adoption in product and service delivery
- More data, models, and feedback create more opportunities for bias
- More regulatory oversight for algorithmic accountability
- More consumer demand for transparency and explainability

“There are lots of different ways that algorithms can go wrong, and what we have now is a system in which we assume because it's a shiny new technology with a mathematical aura that it's perfect and it doesn't require further vetting. Of course, we never have that assumption with other kinds of technology.”

Cathy O’Neil, Author of Weapons of Math Destruction

Sector view of AI risks

Risks differ from sector to sector

As mentioned earlier, there is a need to recognise what AI risks could look like so that organisations can better identify and remediate them. The types of risks and their degree of urgency can vary by sector, which is why different sectors may prioritise them differently.

The financial services and telecom, media and technology (TMT) sectors, for example, are particularly concerned about ethical risks, whereas the healthcare sector considers compliance risks to be the most important ones to manage, according to one of our reports.

Paramount to managing risks, is to address them in a structured manner. A toolkit like PwC's Responsible AI (more on pg. 26) can support organisations in minimising risks by providing them with the relevant tools needed to cover assessments, technology, and people.

The first actionable step in dealing with the moral implications of AI is to develop a clear set of guidance and principles to illustrate how to operationalise ethics in the context of AI. Care should be taken to ensure that these principles are not in conflict with organisation strategy and values. Our Toolkit can help with this, as it is built with key features that include a traceability matrix.

AI risk prioritisation across sectors

	All	TMT	Financial services	Healthcare and pharma	Retail consumer	Industrial product
Control risk	48%	61%	48%	50%	52%	53%
Ethical risk	49%	64%	61%	37%	55%	53%
Performance risk	48%	46%	48%	47%	48%	53%
Security risk	36%	54%	45%	37%	52%	28%
Compliance risk	48%	46%	42%	53%	34%	44%

Key risk areas for AI

Source: PwC AI: An opportunity amidst a crisis

Increased regulatory scrutiny

Safeguards against potential AI risks

Stories about AI gone wrong are not new. We know that inadequate measures can result in algorithms that condone racial or gender bias, or even influence political results.

This has the global community calling for clearer ethical frameworks that can guide individuals and organisations in the responsible development and use of AI.

The National Fourth Industrial Revolution (4IR) Policy recognises the need to mitigate the potential risks arising from the unethical adoption of 4IR technologies, AI included. Ethical concerns could arise in areas such as privacy, transparency, security, accountability, bias, equality, human rights and socio-environmental well-being.

Certainly for the adoption rate of 4IR technologies to increase in the country, these are considerations that organisations will need to review carefully prior to deployment, ensuring business practices are kept within stipulated regulations.

Global AI ethical framework and enforcement

Around the world, governments are looking into the development of frameworks to guide the ethical use of AI. For example, the European Union (EU), a frontrunner in such an initiative, published its guidelines on ethics in AI in April 2019. Meanwhile, the OECD AI Principles were adopted by OECD member countries in May 2019 and subsequently by G20 members in June 2019. At the national level, Australia, Japan, Singapore and Hong Kong have established their own AI ethics frameworks.

Governments are also actively developing legal frameworks for holding algorithms accountable, among them:

- European Union (EU) proposal for regulation on AI.
- EU General Data Protection Regulation - requires companies to use personal information secured in a manner that prevents discriminatory effects.
- California Consumer Privacy Act limits data usage and supports rights to erasure.
- Cyberspace Administration of China requires deepfakes to be disclosed.

Malaysia's AI ethical framework

In Malaysia, where we are working towards greater technology adoption, the need for a framework of a national scale has never been more urgent. The good news is that we are already on that path, with the Centre of Artificial Intelligence for Future Industries (CAIFI) in MIMOS covering the application and ethical use of AI technologies in various economic sectors, and the development of a National AI Framework by MDEC also underway.

In addition, the National Fourth Industrial Revolution (4IR) Policy has proposed for the 4IR ethics framework to be ready in the near term. The purpose of the framework would be to promote ethical and responsible technology practices, from technological development to deployment and utilisation - core to preserving societal values and culture, and upholding equality and fairness.

These frameworks, once released, would have implications for organisations, and it would be imperative for organisations to study and understand them thoroughly in the name of compliance.

European AI regulation

In April 2021, the European Commission proposed a risk-based approach for regulating high-risk applications of AI, in an attempt to set global standards for a key technology dominated by China and the United States.

On its ban list are AI applications that will be used for evaluating social scoring, exploiting vulnerable groups (young, elderly and people with disabilities), real time remote biometric identification in public places, and deploying "subliminal techniques" to "distort a person's behaviour" that may cause harm.

Other high-risk AI applications such as those used in recruitment, critical infrastructure, credit scoring, migration and law enforcement will be subject to strict safeguards.

Companies breaching the rules face fines of up to 6% of their global turnover or 30 million euros (US$36 million), whichever is higher.

From risk awareness to risk action

Slow progress in assessing AI risks

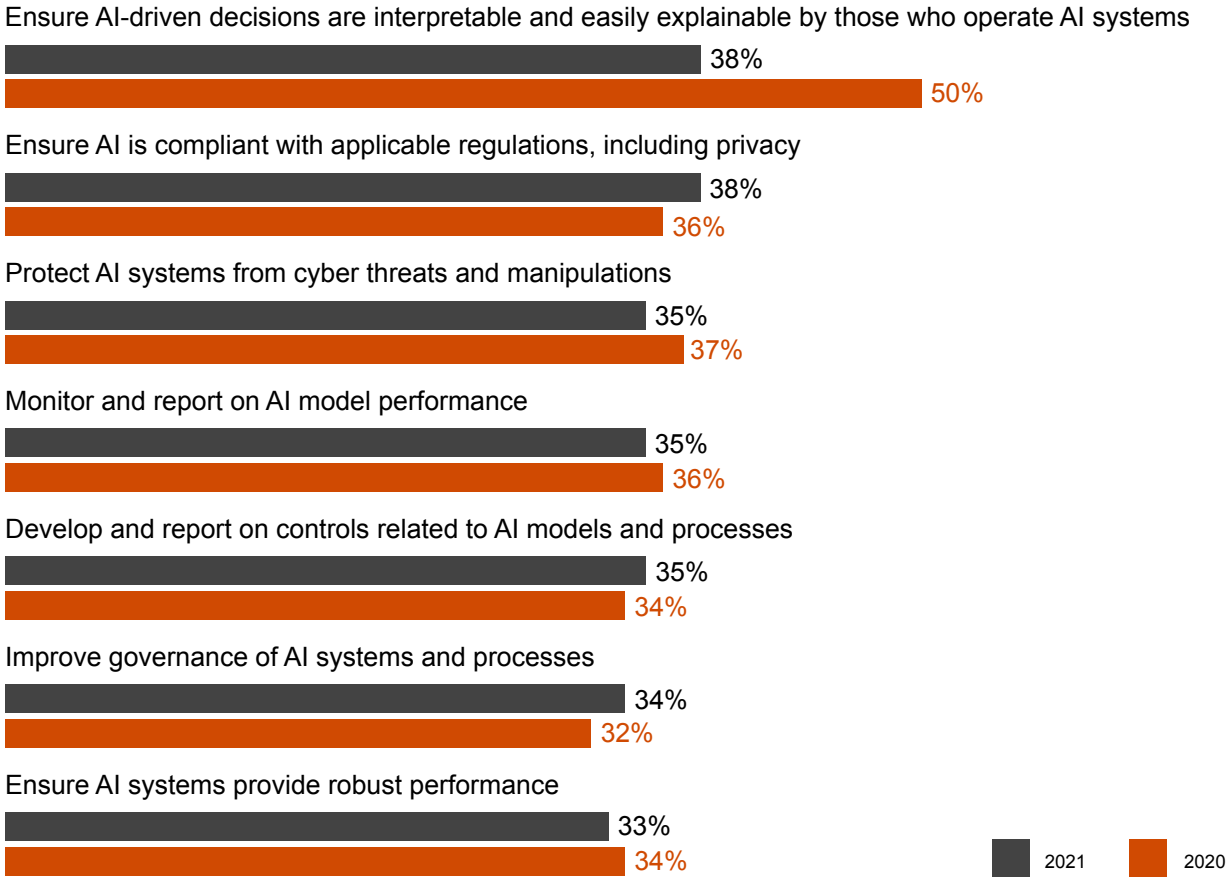
AI is a complex technology that many executives, including risk officers and even IT experts, don't yet fully understand.

Based on PwC's 2021 AI Predictions survey, there is an underappreciation for the true level of effort needed to responsibly capitalise on AI. And when it comes to backing up words with actions, such as implementing controls around decisions or data, there's still a long way to go.

According to the survey, only about one-third of respondents have fully tackled risks related to explainability, compliance, security, AI models and outputs, as the chart on the right illustrates.

Considering the growing public concern over issues such as bias in algorithms or facial recognition tools, and AI-powered 'deepfakes', it's going to be harder to unleash AI's true potential without a responsible risk management framework in place.

Lack of progress in advancing responsible AI



Source: 2021 AI Predictions: From risk awareness to risk action

4

Overcome risks with Responsible AI

Responding to AI challenges across key dimensions

Innovate responsibly

As we've established, risks are a part of AI. But that does not mean that organisations should respond by avoiding it, because that would also mean avoiding its opportunities. Rather, organisations should innovate with AI, while taking the necessary steps to embed proper risk controls within the AI lifecycle.

To adopt a holistic approach, we've identified several key dimensions that organisations should examine when designing and deploying their AI:

- Data and AI ethics
- Policy and regulation
- Bias and fairness
- Interpretability and explainability
- Privacy
- Security
- Robustness
- Safety
- Governance
- Compliance
- Risk management

These dimensions are mapped out in what we call our Responsible AI framework.

Core dimensions within PwC's Responsible AI framework

Strategic

Data and AI ethics

- Extending past 'what do we have to do' dictated by compliance to regulation
- Focus on 'what we should do' in terms of moral implication of uses of data and AI, role of context and stakeholder impact

Policy and regulation

- Anticipate and understand key public policy and regulatory trends to align compliance processes with future regulatory requirements and guidance

Performance and security

Bias and fairness

Defining and measuring fairness for intersectional groups and testing systems against defined standards

Interpretability and explainability

Translating and curating model decision making to different stakeholders based on their needs and uses

Privacy

Utilising emergent privacy-preserving technologies to train resilient systems on large datasets while respecting data protections

Security

Enhancing the cybersecurity of systems and anticipating malicious attacks, such as adversarial attacks

Robustness

Enabling high performing systems over time, and reducing sensitivity to slight changes

Safety

Designing and testing model performance in the context of human users to anticipate and remediate potential harms

Control

Governance

Enabling oversight with clear roles and responsibilities, articulated requirements across three lines of defense, and mechanisms for traceability and ongoing assessment

Compliance

Complying with data protection and privacy regulations, organisational policies, and industry standards

Risk management

Expanding risk detection and mitigation practices to address existing and newly identified risks and harms

Who benefits from Responsible AI?

The implementation of a Responsible AI framework can benefit multiple stakeholders within an organisation, each in their own way, dependent on roles and responsibilities. We take a look at how below. It's also worth noting that a framework would allow for a consistent approach in tackling AI risks organisation-wide, a lack of which may obstruct the smooth operationalisation of Responsible AI (see pg. 23).

Stakeholders	Their background	How Responsible AI can help them	Value proposition
CXO	Business executive who is feeling market pressure to use AI and is unsure whether their organisation is maximising the technology's impact while minimising risk	• Identifies AI opportunities while mitigating risks and maintaining the trust of the market • Enables visibility and stability of AI within the organisation over the long term • Supports operationalisation of ethical principles underlying Responsible AI	**Trust and confidence** that the organisation can pursue AI initiatives whilst maintaining oversight and commitment to stated goals and objectives
Process Owners	Employees who oversee processes in an organisation that utilise AI, and therefore own the risk associated with its use	• Supports operational ease of managing and reporting while addressing business risks • Makes business case to executives for AI investment, given the framework is standardised with associated processes to enable oversight and inspire confidence	**Assurance** in the reliability of AI applications within the business operations they oversee, and **best practices** of how to build and deploy AI models
Data Scientist/Data Analyst	Technical staff who are responsible for AI development and need to understand the impact of AI in production	• Unifies approach for design and delivery, and automates reporting to other stakeholders • Decreases overhead in issue resolution; increases effective communication across process stakeholders	**Accelerated innovation** to deployment with clear direction, less amendments and rework
Compliance and Audit	Compliance/regulatory employees who monitor/evaluate an organisation for compliance with regulations, policies, and standards (internal and external)	• Fills knowledge gap: risk and controls of AI • Instills management confidence in AI usage and assures them of compliance to internal and external standards/regulations/policies	**Reassurance** that AI is properly deployed and employees are **empowered** to evaluate and assess AI across the organisation

Operationalising Responsible AI - Issues to consider

As AI maturity in Malaysia is still relatively low, organisations may not yet be fully aware of the barriers that could hold them back from properly implementing a framework to guide them in deploying AI responsibly. Here are several key issues to anticipate.

1 **Lack of an organisation-wide approach to AI and data governance**. Only 12% of companies globally have their AI risk management and internal controls fully embedded and automated, and 26% of companies have an enterprise approach that has been standardised and communicated, according to PwC's Responsible AI Survey 2020. The rest have a siloed or non-standardised approach to AI risk management.

2 **Inconsistent and siloed ethical approach.** While codes of conduct, ethical boards, ethical training and impact assessment offer a robust ethical AI foundation, considering them in isolation would slow the realisation of benefits promised by ethical AI. Only with a holistic approach would organisations be able to (i) identify and address ethical challenges at different stages of AI development, and (ii) translate abstract principles into actions - policies, functional and non-functional requirements.

3 **Emerging AI regulation.** Regulations have historically not kept pace with technology. For AI, the technology is still rapidly advancing and the risks are not well understood. This makes it difficult to design/co-create long-term regulatory approaches. There is a need to balance between soft governance measures and regulation depending on the use case and risks involved. Hence, a risk-based governance approach is recommended compared to a one-size-fits-all approach.

4 **Multiple stakeholders**. The AI ecosystem has multiple stakeholders - the private sector, research, government, legal bodies, regulators, standard setting bodies, etc. It is important to cultivate a shared understanding of acceptable behaviours among the different stakeholders, and clarify the applicability of existing policies and proposed regulations through a creation of guidelines.

5 **Skills mismatch in the current workforce.** According to our Responsible AI Survey 2020, the lack of right AI technical and management talent always ranks among the top 5 challenges in AI adoption. This finding is consistent across all territories of the Survey, all sectors, and the varying AI maturity levels.

In order to address this, many businesses in the EU are partnering up with their governments to upskill and reskill workers whose jobs have been changed due to automation. This is a form of public-private partnership that Malaysia can look to as an example, in our own mission to strengthen the nation's workforce.

Taking action

Considering the benefits and opportunities posed by AI and its potential to disrupt the market and industry, it is simply a matter of time before your organisation adopts AI — and the clock is ticking. What will determine success is an organisation's effectiveness in mitigating AI risks. To gain the right footing in using AI, here are among the key steps organisations can take to build greater trust.

1. **Take a multidisciplinary approach**. Whichever governance structure your organisation chooses, its team must include:

   - Leadership
   - Procurement
   - Compliance
   - Human resources
   - Technology and data experts
   - Process owners from different functions

   The governing body for AI could be an extension of an existing governance team, or may need to be formed from scratch.

   An example of how an existing governance structure may be augmented or extended, is by adopting a standard three lines of defense risk management model.

2. **Build up your AI risk confidence**. With the help of risk and compliance functions, ensure that you have the right AI policies, standards, controls, tests, and monitoring for all risk aspects of AI.

   This can be done through the creation of a common playbook to act as a 'how to' guide for approaching new AI initiatives. It may be helpful to categorise levels of risks together — such as financial, reputational, safety — to determine the level of rigour required.

   A strong central reference guide will help to frame collaboration, support negotiations between stakeholders on trade-offs between what they'd like to accomplish, and facilitate discussions around the tolerable levels of risk.

3. **Act to maintain performance**. Good governance and risk management don't have to mean slow going.

   The right level of explainability, for example, will depend on each AI model's level of risk and required accuracy levels, allowing for quicker progress in some areas than others.

   It's also possible to automate many governance processes, such as capturing data in model sheets and automatically determining risk ratings for possible human review.

5

PwC's Responsible AI Toolkit

Deploy AI that generates trust and inspires confidence

PwC's Responsible AI Toolkit can support organisations in their AI journey. It consists of a flexible and scalable suite of capabilities, covering frameworks and leading practices, assessments, technology, and people.

The Toolkit is designed to enable and support the assessment and development of AI across an organisation, tailored to its unique business requirements and level of AI maturity.

The Toolkit helps organisations address the dimensions of Responsible AI (as outlined on pg. 21) and supports them through all phases of their journey from the starting point of assessments, to the final stages of evaluation and monitoring.

ASSESS

Technical and qualitative assessments of models and processes to identify gaps

BUILD

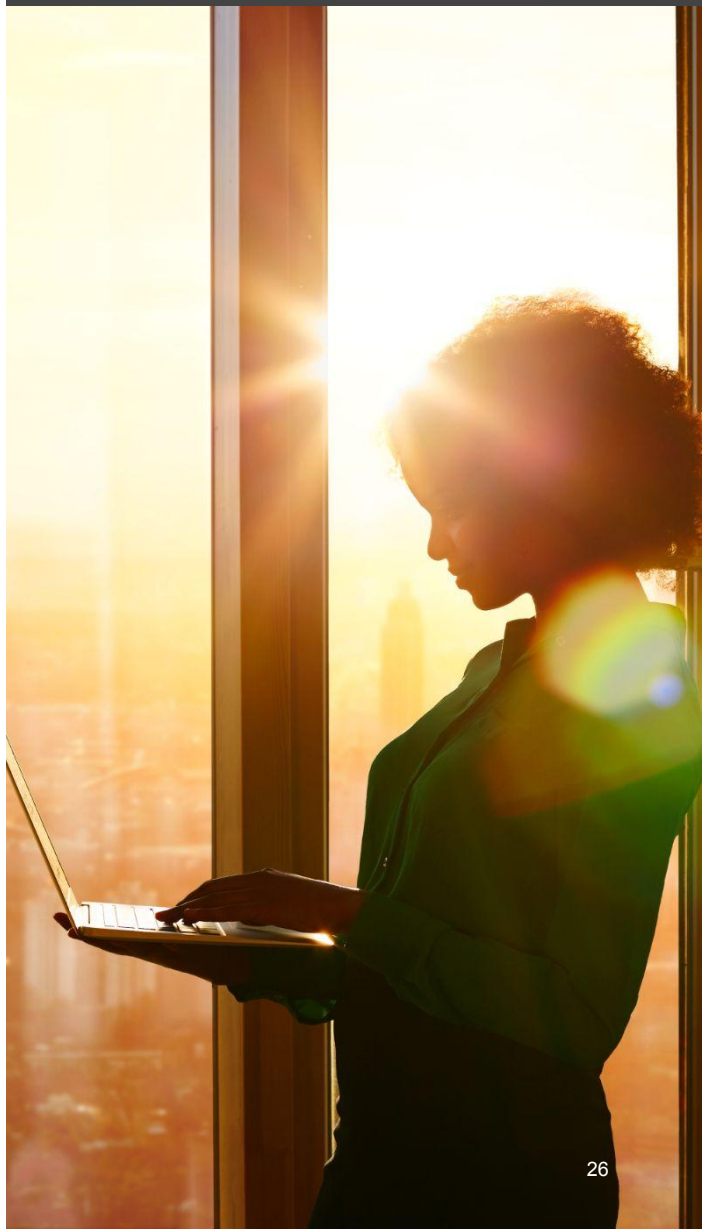
Development and design of new models and processes, given a specific need and opportunity

VALIDATE + SCALE

Technical model validation and deployment services; governance and ethics change management

EVALUATE + MONITOR

Readiness for AI including confirming controls framework design, internal audit training



Whether you are just getting started in AI or are getting ready to scale, our Responsible AI Toolkit is able to assess your needs, and design a solution based on your maturity and unique risks and challenges. Provided below are some of the Toolkit capabilities to enable and support the assessment and development of Responsible AI in your organisation.

Leading practices

The Toolkit provides an ethical context required to understand Responsible AI. It describes the leading practice of ethical AI principles when dealing with AI solutions. This includes:

- Guidelines on how to operationalise and tailor the ethical AI principles
- Nine ethical AI principles defined with detailed description and recommendations
- Ability to map AI principles to organisational strategy and values using traceability matrices

Technology

The Toolkit is enabled by technology, which takes into account the relevance, the associated risks and the AI maturity of an organisation. It provides a set of assets curated to accelerate the evaluation of data, models and their trade-offs.

Toolkit accelerators include the ability to rapidly assess issues such as biasness and interpretability from a particular AI model.

Users are then able to evaluate the trade-offs around performance and the cost from making incremental improvements to the system.

Assessing organisational maturity

PwC's Organisational Maturity Assessment evaluates an organisation's AI governance and ethics readiness.

The maturity level of each domain is determined by averaging findings across the 19 governance sub-domains (65+ considerations) from a wide range of interviewees. Gaps between current and target maturity are then prioritised to inform a maturity gap solution roadmap.

Operationalising data ethics

PwC's Data Ethics helps to codify data ethics into corporate principles, govern the ethical use of data across the organisation, and maintain high standards of data ethics in your supplier network.

People

The Toolkit includes customised training starting from awareness to advanced topics for all levels: C-suite, middle-level management and model developers.

While upskilling is key, it is more important to instill a Responsible AI mindset. A comprehensive Responsible AI programme may also require adjustments to existing organisational structures with changes in roles and responsibilities.

Governance and security

An AI system that does not demonstrate stability and consistency in meeting performance requirements is at increased risk of producing errors and making the wrong decisions. To help make your systems more robust, the Toolkit includes services to help you identify weaknesses in models, assess system safety and monitor long-term performance.

This includes an end-to-end governance process, which acts as a guide map comprising best practices around the adoption and use of AI. This also covers the mapping of user personas (executive, process owner, data scientist and compliance), dimensions (bias, ethics, etc) and Responsible AI assets.

The framework introduces the three lines of security defense (first, second and third line of defenses) in the AI governance process, along with the respective stakeholder roles and responsibilities.

AI impact assessment

The Toolkit includes a bespoke Impact Assessment that conforms to organisational policies comprising approximately 400 questions all aligned to the AI/machine learning development lifecycle and the range of ethical principles.

Conclusion

Don’t leave AI success to chance

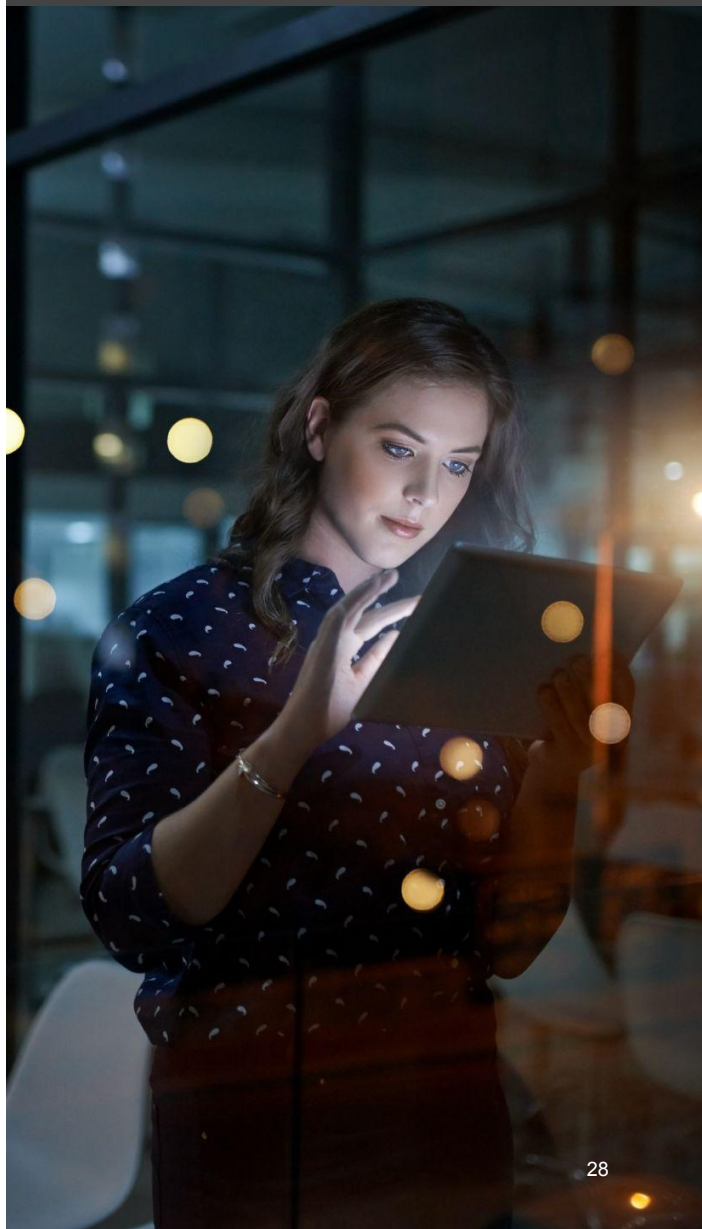
With the National Fourth Industrial Revolution (4IR) Policy spearheading the drive to enhance the nation’s 4IR capabilities, we expect an increase in AI’s take-up rate over the coming years. Organisations that adopt AI and are adept at harnessing its many opportunities would gain competitive advantage, being able to satisfy the demands of today’s customers who value speed, accuracy, and enhanced digital experiences.

But we have to remember that AI is a coin with two faces. The face of AI most people are familiar with is the advantages and opportunities that it enables. However, behind the opportunities that it brings lies discrimination, behind the insights and predictions that AI provides, there is the risk of a wrong prognosis.

For organisations implementing AI, you don't want your success to rest on a coin toss, leaving it to chance. You need to be prepared to face the risks that AI poses, as it would only be a matter of time before you encounter them.

Should you aspire to take your AI applications to the next stages of maturity, you will need a thorough framework to guide you in assessing the strength of your controls and processes across the Responsible AI dimensions we’ve identified. With PwC’s Responsible AI Toolkit, we believe organisations will be better equipped to develop transparent, explainable and ethical AI applications, ones that generate trust and inspire confidence among employees, customers, business partners, and other stakeholders.

The more prepared you are in mitigating the risks, the more equipped you are to succeed, landing your organisation on the right face of AI.



Get in touch

Elaine Ng
Risk Assurance Services Leader
PwC Malaysia
+60(3) 2173 1164
yee.ling.ng@pwc.com

Ong Khai Chiat
Partner, Risk Assurance Services
PwC Malaysia
+60(3) 2173 0358
khaichiat.ong@pwc.com

Clarence Chan
Director, Risk Assurance Services
PwC Malaysia
+60(3) 2173 0344
clarence.ck.chan@pwc.com

Michael Graham
Chief Digital Officer
PwC Malaysia
+60(3) 2173 0234
michael.graham@pwc.com

Marina Mokhtar
Partner, Economics and Policy
PwC Malaysia
+60(3) 2173 1699
marina.che.mokhtar@pwc.com

Nataraj Veeramani
Assurance Director
PwC Malaysia
+60(3) 2173 0897
nataraj.veeramani@pwc.com

pwc.com/my