Asia-Pacific Economic Cooperation

Supporting AI at Scale in the APEC Region Through International Standards

Recommendations Report

APEC Sub-Committee on Standards and Conformance

October 2024

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ABOUT STANDARDS AUSTRALIA

Standards Australia is Australia's independent, non-government, not for profit standards development organisation.

We are a global leader in trusted solutions that enable economic, social and environmental progress. The work of Standards Australia and our staff, stakeholders, members and contributors supports building capacity and promotes economic integration in the region.

Standards Australia's vision is to be a global leader in trusted solutions that improve life – today and tomorrow.

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Abbreviations and acronyms used in this Report

AI	Artificial Intelligence
APEC	Asia-Pacific Economic Cooperation
ICT	Information and Communication Technology
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Organization for Standardization
ITU-T	International Telecommunications Union Telecommunication Standardization Sector
JTC 1	Joint Technical Committee 1 (Joint ISO and IEC Committee)
MSME	Micro, small to medium enterprises
ML	Machine Learning
NIST	National Institute for Standards & Technology
NSB	National Standards Body
OECD	Organisation for Economic Co-operation and Development
SDOs	Standards Development Organisation
NSB	National Standards Body
QI	Quality Infrastructure
SA	Standards Australia
SCs	Sub Committees
TBT	Technical Barriers to Trade
TCs	Technical Committees
WGs	Working Groups
WTO	World Trade Organization
WTO TBT Agreement	The World Trade Organization Agreement on Technical Barriers to Trade

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CEO's Foreword

Artificial Intelligence (AI) holds immense potential to drive significant economic, social and environmental benefits in all APEC economies. By enhancing decision-making processes, improving operational efficiency, and boosting productivity, AI can unlock innovation and create and expand markets and revenue streams. Indeed, the adoption of AI is already having an impact in APEC economies across every industry – from healthcare to manufacturing to technology.

To put the opportunity in perspective, a forecast by PWC predicts that AI is projected to contribute as much as USD22.17 trillion to the global economy by 2030, and the APEC economies are well positioned to share in these benefits.[1] For the transformative and economic benefits to be realised, however, the right settings need to be in place to support the responsible scaling of AI in the region.

New and emerging AI technologies are transforming business practice and challenging established approaches to public policy and regulation. The development of unclear or unharmonised regulatory approaches that are not interoperable and the need for organisations to adapt to this new landscape without proper guidance risks blocking the realisation of the opportunities presented by responsible AI, and risks undermining public trust and confidence in emerging technologies.

A fundamental element in shaping the responsible design, development and scaling of AI is the establishment and adoption of international standards. These promote consistency and interoperability in products, services and solutions, and underpin the efficient, safe and reliable functioning of AI solutions. They also are a basis for establishing common approaches to the regulation of emerging technologies.

This is why we have developed the *Supporting AI at Scale in the APEC Region Through International Standards Recommendations Report*. The aim of this Recommendations Report is to highlight the opportunities, challenges and potential solutions to support scaling of AI in the APEC economies. It provides an overview of the key international standards for AI and aims to provide a platform for dialogue and discussion on how adoption and implementation of AI standards can support uptake of AI in the APEC region.

Our hope is that this Recommendations Report and this APEC initiative, more broadly, will help to bring about a greater awareness and understanding of the issues and challenges businesses and regulators face in ensuring AI is scaled responsibly, and above all, promote and contribute to a greater understanding of the benefits and importance of the international standards for AI. This is an important and necessary step in supporting the development and use of technology through harmonisation and interoperability of quality requirements for AI systems across markets, and effectively promoting responsibility, trustworthiness and confidence in emerging AI systems and AI technologies.

– Adrian O'Connell
CEO Standards Australia

[1] PwC. 2019. Sizing the prize: PwC's Global Artificial Intelligence Study: Exploiting the AI Revolution. Price Waterhouse Coopers. London.

1.0 Executive Summary

> *"With the potential to transform entire industries, supply chains, and markets, AI presents a paradigm-shifting opportunity for APEC as a regional economic forum."*[2]
>
> - **APEC Business Advisory Council (ABAC)**

Recent developments in Artificial Intelligence (AI) and automation have put us on the cusp of a new automation age. Over the past few years, the advances in AI technology have led to the emergence of machines that can accomplish cognitive capabilities once considered too difficult to automate successfully through combining large data sets with intuitive processing algorithms.[3] This has resulted in AI being taken up by greater numbers of individuals, businesses, and governments to support increased efficiency and productivity across sectors. This embrace of AI technologies is expected to continue and intensify, with estimates that AI will add USD15 trillion to the global economy by 2030 and boost global GDP by 14 per cent.[4]

AI has enormous potential to advance economic and societal wellbeing and enable improved environmental outcomes within the APEC region. AI is already driving innovation and efficiencies and is supporting the creation of unprecedented new products, systems and services across the region, from automated health diagnostics in hospitals to smart agriculture and precision farming systems that are optimising yields at the farmgate. It offers vastly improved decision-making and cost reduction, enabling businesses and policy makers to boost productivity and speed, scale and consistency of service.

When done right, AI has proven to deliver real benefits. It is of no surprise that there is excitement surrounding the opportunities that AI presents to unlocking transformative economic, societal, and environmental benefits in the APEC region. A recent Microsoft – IDC Study[5] found that almost all businesses believe that AI is central to their growth, with 80 per cent of business leaders in the Asia-Pacific region reporting that it is instrumental to their organisation's competitiveness. The same study found that the businesses surveyed believe that AI will almost double the rate of innovation in the short term.

Success is not guaranteed, however. A recent ABAC report, *"Artificial Intelligence in APEC: Progress, Preparedness, and Priorities"*, found that the APEC economies are not optimally prepared to take advantage of AI. The report found that, while AI presents a paradigm-shifting opportunity for APEC, risks and blockages to uptake of AI could be just as significant, ranging from ethical considerations to a lack of preparation required to take advantage of the coming revolution.[6] A recent McKinsey study found that of a sample of institutions that have adopted AI, only 55 percent of institutions believe their automation

[2] APEC Business Advisory Council (ABAC), *"Artificial Intelligence in APEC: Progress, Preparedness, and Priorities"*, 2021, https://abac.ph/wp-content/uploads/2022/06/Artificial-Intelligence-in-APEC-2021.pdf.
[3] Digital/McKinsey, *"Driving impact at scale from automation and AI"*, February 2019, https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Driving%20impact%20at%20scale%20from%20automation%20and%20AI/Driving-impact-at-scale-from-automation-and-AI.ashx.
[4] Holmes, Frank, *"AI Will Add $15 Trillion To The World Economy By 2030,"* Forbes, Great Speculations, 25 February, 2019, https://www.forbes.com/sites/greatspeculations/2019/02/25/ai-will-add-15-trillion-to-the-world-economy-by-2030/?sh=214b41f61852.
[5] Microsoft – IDC Study, *"Artificial Intelligence to nearly double the rate of innovation in Asia Pacific by 2021"*, February 20, 2019, https://news.microsoft.com/apac/2019/02/20/microsoft-idc-study-artificial-intelligence-to-nearly-double-the-rate-of-innovation-in-asia-pacific-by-2021/.
[6] ABAC, *"Artificial Intelligence in APEC: Progress, Preparedness, and Priorities"*, 2021.

program has been successful to date.[7] While a 2023 study by KPMG and the University of Queensland found that three out of five people (61 %) in the study's global survey were wary about trusting in AI systems, reporting either ambivalence or an unwillingness to trust.[8]

To realise the opportunities afforded by AI in the APEC region and to ensure that AI benefits society as a whole, a comprehensive response to these challenges through policies and institutional frameworks that guide responsible AI design and use is necessary. Over the past few years, numerous domestic and international policies, principles and guidelines have been developed that aim to ensure that AI systems are designed to be robust, safe, fair and trustworthy. More recently, governments have begun to develop regulatory settings for AI to promote the same objectives.[9] These efforts play a critical role in supporting the responsible development and development of AI. However, given the number of different approaches being developed across the region, there is growing concern that differing approaches to AI governance risks creating confusion for business and fragmenting the market if they are not underpinned by internationally agreed benchmarks and consensus points.[10]

The *Supporting AI at Scale in the APEC Region Through International Standards* project responds to these findings. Funded by the Australian Department of Foreign Affairs and Trade (DFAT), Standards Australia implemented this project with the aim of investigating and making recommendations on how international standards can be used and implemented to practically help businesses and government in the APEC region to safely adopt AI. This project comprises of four components implemented in 2023 and 2024, including:

- A desktop review and APEC-wide survey on the standards and policy landscape for AI in the APEC region that was conducted in June and July 2023.
- An Issues Paper on barriers to operationalising and scaling AI and how international standards can reduce these barriers and supporting video content on related AI use cases that were released in August 2023.
- A workshop to facilitate discussions on how international standards can support operationalising and scaling AI in the APEC region, including by looking at use cases to establish best practice and determining any gaps in the standards landscape that was hosted at the APEC Senior Officials' Meeting 3 (SOM 3) in Seattle Washington in August 2023.
- This Recommendations Report that is based on the findings in the issues paper and the forum.

Standards must play a constructive role in enabling the widespread use of responsible AI in the APEC region. They present agile and fit for purpose solutions that shape responsible design, deployment and evaluation of new technologies in the digital economy. Consensus-based international standards are globally recognised benchmarks that promote harmonisation and interoperability across markets, supporting innovation and international trade. Importantly for AI, they also promote responsibility, trustworthiness, security, and confidence in emerging systems and technologies, and establish common building blocks and risk management frameworks for companies, governments and other organisations.

This Report highlights that there is an increasing number of international standards relating

[7] Digital/McKinsey, *"Driving impact at scale from automation and AI"*, February 2019, https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Driving%20impact%20at%20scale%20from%20automation%20and%20AI/Driving-impact-at-scale-from-automation-and-AI.ashx.
[8] Gillespie, N., Lockey, S., Curtis, C., Pool, J., & Akbari, A, *Trust in Artificial Intelligence: A Global Study*, The University of Queensland and KPMG Australia, 2023.
[9] Schwartz Reisman Institute for Technology and Society, *"Discerning signal from noise: The state of global AI standardization and what it means for Canada"*, January 2023, https://www.scc.ca/en/system/files/publications/SRI_DiscerningSignalFromNoise_English_v2.pdf.
[10] Alex Engler, *The EU and U.S. diverge on AI regulation: A transatlantic comparison and steps to alignment*, Brookings Research, April 25 2023, https://www.brookings.edu/articles/the-eu-and-us-diverge-on-ai-regulation-a-transatlantic-comparison-and-steps-to-alignment/#anchor8.

to AI that can help address the complexities that impede the scaling of AI in APEC economies. These standards take the form of governance standards that provide a view on what good looks like at the organisational or system level, management systems that can include specific risk management frameworks and controls within organisations and technical standards that are focused on factors such as terminology, AI models and systems, and data quality and processing. To realise AI at scale in the APEC region, this Report argues that these standards must be leveraged to mitigate risks, support innovation, and facilitate open markets.

- **Section two** provides an overview of the Report recommendations to APEC economies and private and public stakeholders to support AI at scale in the APEC region through International Standards.
- **Section three** summarises AI at scale, including what it looks like and how it can be achieved. It also provides an overview of the barriers to operationalising and scaling AI in the APEC region.
- **Section four** outlines the AI related measures that are in place and are emerging in the APEC region. It reviews the domestic AI policy and regulatory settings among APEC economies and the extent to which they are interoperable across the region.
- **Section five** provides an overview of what AI international standards are and how they can support AI at scale in the APEC region. It also highlights how international standards can support regulatory harmonisation across the region.
- **Section six** summarises the international standards ecosystem for AI, including completed standards and work underway within key Standards Development Organisations (SDOs). Specifically, it focuses on ISO/IEC JTC 1/SC 42 Artificial Intelligence, and other multinational SDOs.
- **Section seven** provides more detailed clear and actionable recommendations to APEC economies and private and public stakeholders to support AI at scale in the APEC region and **Section eight** concludes.

During the *Supporting AI at Scale in the APEC Region Through International Standards* project Workshop and in the Project Survey, participants identified that, even as we see the social and economic potential of AI, there are several risks and complexities that impact uptake in both the private and the public sectors across the APEC region. Barriers to operationalising and scaling AI include: **(1) the risk of poor data quality and biases in AI systems; (2) data privacy and security considerations; (3) lack of skilled personnel and knowledge to develop, implement, and maintain the technology; (4) lack of access to guidance and standards; and, (5) ethical and regulatory considerations**. It was also identified that there are cross border challenges, as varying policies and regulation across sectors and jurisdictions, including on data privacy and security, can act as barriers to trade of AI solutions. In addition, there is the issue that public and private trust in AI remains low and there is a low level of understanding of AI and its benefits.

In response to these challenges, the participants also identified how international standards for AI can play an important role in enabling the widespread use of responsible AI in the APEC region. Responses included that international standards for AI provide a common view on good practice by establishing specifications, frameworks, and requirements upon which AI technologies can be built, tested and deployed. For business and consumers, it was noted that standards:

- Support business by setting globally agreed-upon principles and processes for AI technologies that ensure consistency in the development, deployment and use of AI.
- Support trust and confidence in AI products and services by providing assurance of safety and reliability to users and consumers.
- Facilitate interoperability of products and services across borders, supporting trade,

innovation and competition.

While for government, it was noted that international standards for AI can support establishing and underpinning AI policies and regulations. New and emerging AI technologies are challenging established approaches to public policy and regulation. International standards present agile and fit for purpose globally developed solutions that cover topics from ethical and responsible development and use of AI to data management and use, as well as key topics such a trustworthiness, privacy and cyber security.

Survey respondents reported the view that policy makers and regulators in the APEC region should (**1) leverage international standards in the development of regulatory and policy frameworks; and, (2) leverage standards as a means of demonstrating conformance**. In doing this, policy makers and regulators will promote harmonisation in approaches to managing risks in AI across sectors and jurisdictions. They will also support establishing alignment and regulatory compatibility across different APEC economies, helping to avoid fragmentation, conflicting regulation and cost and red tape impediments for business.

In an increasingly complex ecosystem, standards are vital to removing obstacles and addressing complexities that impede the scaling of AI. They provide frameworks for managing data quality across the AI lifecycle, as well as for managing privacy, cyber security, bias and explainability, and provide tools for oversight of AI systems and the management of risk. It is our hope that this Recommendations Report and the mapping of AI standards that is included within it will serve to increase industry and government awareness and implementation of AI standards. In addition, we hope that, through actioning key recommendations in the Report, APEC economies will support the responsible development and adoption of AI in both the public and the private sectors in the APEC region.

2.0 Recommendations – At a Glance

The responders to the project survey and the participants in the *Supporting AI at Scale in the APEC Region Through International Standards* identified a range of recommendations to support AI at scale in the APEC region through international standards. An overview of these recommendations is included below.

2.1 Regional level recommendations

1. APEC SCSC to encourage and support APEC economies to participate in the development and adoption of AI international standards.

2. APEC SCSC to facilitate sharing of information on AI standards and their use in policies and regulatory settings in APEC economies to support harmonised approaches, best practice and successful models being adopted.

3. Develop a comprehensive international and APEC economy-specific AI standards mapping to identify opportunities for harmonisation and to support the private and public sector to adopt implement relevant standards.

4. Develop an APEC Guideline and Best Practice for the adoption of AI international standards to assist APEC members, policymakers, regulators and industry to adopt and implement standards to support responsible design and use of AI in APEC economies.

5. Develop guidance and training materials to support the public and private sector in the APEC region to adopt and implement AI international standards in support of responsible design and use of AI.

6. Support APEC economies to adopt and implement international standards as per the APEC Guideline and Best Practice for the adoption of international standards.

2.2 APEC member economy recommendations

7. Increase participation and support business participation in developing AI standards in international standards bodies.

8. Develop comprehensive roadmaps and guidelines that identify and adopt relevant international standards to support responsible design and use of AI.

9. Use international standards as a basis for establishing or as a means to demonstrate conformance to any AI regulation, where appropriate.

10. Invest in capacity building and training for public and private sector to adopt and implement AI international standards.

11. Raise awareness among the public regarding the benefits and risks of AI, and how international standards can support mitigating risks.

2.3 Private sector recommendations

12. Increase participation in developing AI standards in international standards bodies.

13. Conduct an internal gap analysis and review mapping of AI standards and identify the standards that can support business efficiencies and ambitions, and/or assist with adhering to regulatory requirements.

14. Align business practice with relevant standards to support responsible design and use of AI.

15. Attend capacity building and training on AI standards to increase understanding, where there is interest.

3.0 Scaling AI in the APEC region and its impediments

3.1 What is AI at scale?

AI is no longer exclusively for Big Tech companies. The recent example of the rapid development of RNA-based COVID-19 vaccines, and the key role that AI technology played in supporting this innovation, showcases AI's world-transforming power. While mRNA vaccines were not new, the use of AI in their development proved to be a gamechanger in helping multiple companies to identify potential molecular targets on the COVID-19 virus where vaccines might act.[11] AI also helped to optimise for vaccine efficacy and ease of manufacture in the development process. Once vaccines were developed, AI provided additional value by predicting the spread of the virus to support efficient testing and distribution. The case of mRNA vaccines is a success story of collaboration between government and industry that shows the world-transforming power of AI when used at scale.[12]

For business leaders and policy makers, AI at scale refers to how deeply and widely AI is integrated into an organisation's core products or services and business process. To reap the transformative benefits of AI, the technology needs to be scaled. AI is most valuable when it is it is a tool that organisations and government use as part of their day-to-day business to deliver quality AI-powered products and services.

Unfortunately, scaling AI in this way is not easy. While AI is embedding into the products and processes of virtually every industry, organisations and governments are still struggling to scale AI to reach its full potential. A recent McKinsey report found that while the business world is beginning to harness AI technologies and their benefits, fundamental transformation barriers remain, as adoption entails multiple, continuous, and simultaneous adjustments of an organisation's resources, culture and decision-making.[13] Similarly, a Deloitte report on *"Scaling AI in Government"* found that AI maturity is a challenge for government organisations due to technical limitations and governance challenges that limit large-scale adoption of AI platforms that vary in scope and complexity. [14] It also noted that the impact of this is that AI adoption often gets stalled at the pilot stage.[15]

While getting one or two models into production can be achievable, deploying AI across an entire enterprise or product often requires enterprise-wide digital transformation and brings significant complexity. A further challenge is that as AI is scaled, the risks associated with its use also increase. There are numerous examples of data privacy and security breaches, biased data perpetuating discrimination and a lack of transparency resulting in problematic outcomes from AI models. To mitigate these risks, and to build public and private trust in AI, organisations must adopt responsible AI practices, including robust AI and data governance to ensure trustworthiness, accountability, risk management, and transparency.

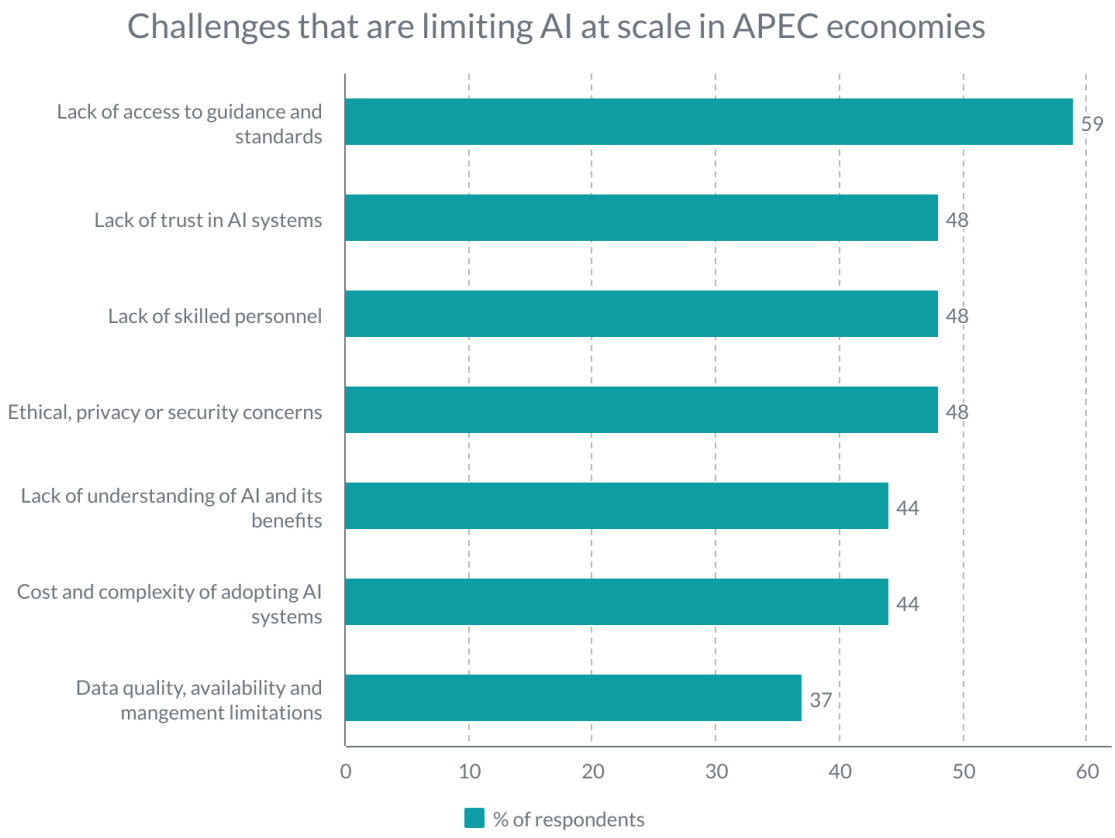
[11] Gunjan Arora et al., *"Artificial Intelligence in Surveillance, Diagnosis, Drug Discovery and Vaccine Development against COVID-19"* report, Pathogens 10, 8 (2021).
[12] Deloitte, *"Scaling AI in government"*, December 2021, https://www.deloitte.com/au/en/our-thinking/insights/industry/government-public-services/government-ai-survey.html.
[13] McKinsey & Company, "*Unlocking success in digital transformations"*, October 2018, https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/Organization/Our%20Insights/Unlocking%20success%20in%20digital%20transformations/Unlocking-success-in-digital-transformations.pdf.
[14] Deloitte, *"Scaling AI in government"*, December 2021.
[15] *Ibid.*

3.2 Barriers to operationalising and scaling AI in the APEC region

The ABAC report *"Artificial Intelligence in APEC: Progress, Preparedness, and Priorities"* finds that APEC is not optimally prepared to take advantage of AI, as a number of barriers impact member economies ability to operationalise and scale AI.[16] To gain a greater understanding of these barriers, Standards Australia with support of the APEC SCSC secretariat undertook an APEC-wide survey on *Supporting AI at Scale in the APEC Region Through International Standards* to evaluate the level of preparedness in APEC for AI at scale.

The survey was well supported with over 70 responses from 14 member economies. On the question of what are the key challenges that are limiting AI at scale in APEC economies (where multiple answers were allowable) the survey showed a number of significant challenges that were grouped around key themes. These include a lack of access to or awareness of guidance and standards that support responsible development and deployment of AI (59%), a lack of trust in AI systems (48%), lack of skilled personnel to develop, implement and maintain the technology (48%), and ethical concerns related to privacy, security, bias, or accountability (48%). See Figure 1 for the full results.

Figure 1: Challenges that are limiting at scale in APEC economies. Source Supporting AI at Scale in the APEC Region Through International Standards Survey.



These survey results are unlikely to be surprising. There have been numerous reports and

[16] ABAC, *"Artificial Intelligence in APEC: Progress, Preparedness, and Priorities"*, 2021.

articles written about the risks and challenges that AI poses and the impact that they have on the uptake of AI systems. The concerns have been fueled by high profile cases of AI use that was biased, discriminatory or unlawful. There are many examples of AI being used for potentially harmful purposes, such as:

- perpetuating and amplifying existing bias in the data they are trained on;[17]
- creating fake content and misinformation;[18]
- generating deepfakes for harmful or deceitful purposes.[19]

To complement these quantitative findings, we asked attendees at *the Supporting AI at Scale in the APEC Region Through International Standards* Workshop to identify: "What concerns you or your stakeholders most about the use of AI in your economy?" The responses reinforced that representatives across the APEC region are concerned most about transparency in AI use and decision making and risks associated with AI causing harm due to manipulation or error. Responses included concerns regarding:

- a lack of standards, regulations, policies and governance in place in their economy and internationally to make AI use safe and ethical;
- a lack of transparency regarding when and how AI is being used, what decisions it is making and how it comes to an outcome;
- cybersecurity attacks, hacking and privacy breaches;
- harmful use of AI, including unintended bias or system failure causing harm; and,
- poor or biased decisions and loss of human judgement in decision making.

Table 1: Case study – Bias in data-driven technologies

Case Study: The risk of data driven biases in AI technologies

In 2014, a team of engineers at Amazon began working on a project to automate the review of resumes in the Amazon hiring process. They built an algorithm that reviewed resumes and determined which applicants Amazon should interview. It was discovered in 2015 that the system discriminated against women for technical roles, such as software engineer positions, having developed a bias due to the existing pool of Amazon software engineers being overwhelmingly male.[20]

The software was fed data about the existing engineers' resumes, including indicators for gender such as schools attended and associations that they participated in, resulting in a systemic bias. Despite efforts to rectify this, it is reported that Amazon recruiters did not use the software to evaluate candidates because of these discrimination and fairness issues.[21]

This is an example of how bias in AI can lead to decisions that can harm humans. AI can make decisions that affect whether a candidate gets a job with outcomes being impacted by unintended bias. Without the appropriate safeguards in place, AI can exhibit biases that stem from their programming and data sources, such as in this example, where the data driven software was trained on a dataset that underrepresents a particular gender.

[17] Erika Ota-Liedtke, Madhuri Raghunath, *"New AI technologies can perpetuate old biases: some examples in the United States"*, OECD.AI Website, October 18, 2022, https://oecd.ai/en/wonk/ai-biases-usa.
[18] A Satariano and P Mozur, *"The People Onscreen a]re Fake. The Disinformation is Real"*, New York Times website, 7 February 2023, https://www.nytimes.com/2023/02/07/technology/artificial-intelligence-training-deepfake.html.
[19] K Hiebert, *"Democracies are Dangerously Unprepared for Deepfakes"*, Centre for International Governance Innovation website, 27 April 2022, https://www.cigionline.org/articles/democracies-are-dangerously-unprepared-for-deepfakes/.
[20] Rachel Goodman, *Why Amazon's Automated Hiring Tool Discriminated Against Women*, ACLU, October 12, 2018, https://www.aclu.org/news/womens-rights/why-amazons-automated-hiring-tool-discriminated-against.
[21] *Ibid.*

3.3 Challenges that are limiting AI at scale in APEC economies

Realising the benefits that AI offers at scale and the return on investment in AI technologies requires responding to the risks and challenges that threaten responsible deployment of AI and impact the public's trust in AI solutions.[22] Sustained scaled AI in the APEC economies is reliant on addressing the key challenges identified in the survey results above and expanded upon below.

Table 2: Challenges that are limiting AI at scale in APEC economies. Source Supporting AI at Scale in the APEC Region Through International Standards Survey.

Challenges that are limiting at scale in APEC economies	
Lack of awareness and trust	The lack of awareness and understanding of AI is a significant issue that impacts its uptake across industries. Many businesses, particularly micro, small and medium-sized enterprises (MSMEs), and policy makers do not comprehend the potential benefits and applications of AI. This is also the case for the public, where recent reports show that people who perceive more benefits from AI are also much more likely to trust AI systems. Conversely, a lack of understanding can lead to skepticism and fear.[23] Misconceptions, as well as incidents of misuse and the perception that AI will create job loss, can create resistance to adoption and acceptance of AI technologies, with recent studies showing that most people are wary about trusting AI systems and have low or moderate acceptance of AI.[24] This lack of awareness and understanding of AI is highlighted by the survey results that show that there is a perception across APEC that a lack of access to guidance and standards, including a lack of consensus on guidance, that support responsible development and deployment of AI is the key challenge that is limiting AI at scale in APEC economies.
Data Quality and Availability	Highly accurate AI systems require high-quality, relevant data to function effectively. However, organisations often struggle with data quality and managing data throughout the AI system lifecycle. This creates a bottleneck to uptake of AI solutions, as data sets can be incomplete, not representative or balanced, outdated, or a combination of these.[25] Poor data quality results in unreliable or inappropriate AI models with inaccurate or biased outputs. Additionally, data silos and poor data management and governance within organisations can limit the availability of relevant and complete datasets that are necessary to enable AI models. According to Gartner, 85% of data driven projects (like AI and IoT) fail to move past preliminary stages, citing the lack of suitable data as a big factor.[26] To respond to this, organisations must effectively manage data to enhance performance and reliability during the data preparation stage, during model

[22] Gillespie, Lockey, Curtis, Pool, Akbari, *Trust in Artificial Intelligence: A Global Study*.
[23] *Ibid.*
[24] *Ibid.*
[25] Mori, L. Richardson B., Saleh, T., Sellschop, R., Wells, Ian., *Clearing data-quality roadblocks: Unlocking AI in manufacturing*, McKinsey's Digital Practice, January 20, 2023, https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/clearing-data-quality-roadblocks-unlocking-ai-in-manufacturing.
[26] Gartner, *"Nearly Half of CIOs Are Planning to Deploy Artificial Intelligence"*, February 13, 2018, https://www.gartner.com/en/newsroom/press-releases/2018-02-13-gartner-says-nearly-half-of-cios-are-planning-to-deploy-artificial-intelligence.

	training and during data quality monitoring for "launched" models.[27] Comprehensive data management systems are necessary for AI deployment as they play a crucial role in ensuring the quality, accessibility, and reliability of data used by AI systems.
Privacy and security	AI systems require rich, large and quality data sets to allow AI systems to be designed, tested and improved. Often these datasets include sensitive and personal information. There is the potential for individuals' data to be used in ways that raise privacy and security concerns. Cybersecurity risk from hacking or malware was the dominant concern raised by 84 % of people in a KPMG and University of Queensland global survey on perceived risks from AI use.[28] The fear of compromising data privacy and security can lead to hesitancy in adopting and using AI technologies. Organisations must have in place robust data privacy and security measures to build and maintain responsible AI systems and to ensure that data is protected from unauthorised access, theft, or misuse and maintain customer trust.
Safety, legal and ethical concerns related to bias, fairness and accountability	Inaccuracies from AI models can result in misleading or erroneous outputs that raise safety, legal and ethical concerns. There have been several high-profile cases of unreliable or inaccurate AI systems creating safety risks. AI automated decision making increases the risk of automating unwanted bias and inequalities, and risks a lack of fairness, accountability and transparency. Algorithmic bias, which is the systematic or repeated decisions that privilege one group over another, is often seen as one of the biggest risks of AI. Bias in AI can result from datasets that are not comprehensive and from flawed model design or interpretation, such as machine learning software being trained on a dataset that underrepresents a particular gender or ethnic group. Increasingly, it is recognised that AI bias can also be a result of systemic biases that result from institutions operating in ways that disadvantage certain social groups and human biases that can relate to how people use data to fill in missing information.[29] There have been numerous recent high-profile cases of discrimination against individuals based on race or gender. Another ethical risk is that of system accountability and transparency. This is the question of validity and whether the reliability of data used to train models is appropriate for their intended purpose. Transparency and accountability are important for the AI market as it allows validation and trustworthiness of an AI model. To ensure responsible AI development and deployment, AI systems must be designed, tested and validated to mitigate for unwanted bias and to ensure accountability.
Lack of skilled personnel	AI requires a highly skilled workforce to develop, implement, and maintain the technology. The ability to generate value from AI depends on having the right AI solutions and skilled personnel to use them. However, there is a shortage of AI experts and data scientists, which is limiting the ability of

[27] Vikram Chatterji, *Data Quality: The Real Bottleneck In AI Adoption*, Forbes, February 1, 2023, https://www.forbes.com/sites/forbestechcouncil/2023/02/01/data-quality-the-real-bottleneck-in-ai-adoption/?sh=275d63af1022.
[28] Gillespie, Lockey, Curtis, Pool, Akbari, *Trust in Artificial Intelligence: A Global Study*.
[29] Schwartz, R., Vassilev, A., Greene, K., Perine, L., Burt, A., Hall, P., *NIST Special Publication 1270: Towards a Standard for Identifying and Managing Bias in Artificial Intelligence*, National Institute of Standards and Technology (NIST), US Department of Commerce, March 2022.

	organisations to operationalise and scale AI. An EY study found that 31% of US CEOs and business leaders believe a lack of skilled personnel is the greatest barrier to AI implementation.[30] While Deloitte's 5th Edition of the State of Ai in the Enterprise that surveyed 2,620 global business leaders found that the ability for an organisation to achieve differentiated tools and applications with AI still hinges in large part on the talent it is able to bring in-house.[31] In order to overcome barriers to maximising AI implementation, the same EY report found that the most important factors for responding to this were having a clear organisational strategic vision and commitment to AI that is driven by senior leadership.[32] While the Deloitte report argues that rewards can be lucrative for organisations that undertake four key actions to overcome the skill shortage: (1) invest in culture and leadership to establish new ways of working and to drive greater business results with AI; (2) transform operations to accommodate the unique demands of new technologies; (3) orchestrate tech talent by strategising based on the skill sets they have available, whether from humans or pre-packaged solutions; and, (4) select use cases that can help accelerate value.[33]

[30] EY, *"EY study: AI important to a company's success, but lack of skilled personnel remains a barrier"*, 14 Aug 2019, https://www.ey.com/en_gl/news/2019/08/ey-study-ai-important-to-a-companys-success-but-lack-of-skilled-personnel-remains-a-barrier.
[31] Deloitte, *Deloitte's State of the AI in the Enterprise, 5th Edition Report: Fueling the AI transformation: Four key actions powering widespread value from AI, right now.*, October 2022, https://www2.deloitte.com/content/dam/Deloitte/us/Documents/deloitte-analytics/us-ai-institute-state-of-ai-fifth-edition.pdf.
[32] EY, *"EY study: AI important to a company's success, but lack of skilled personnel remains a barrier".*
[33] [33] Deloitte, *Deloitte's State of the AI in the Enterprise, 5th Edition Report.*

4.0 AI Policy and Regulation in the APEC Region

4.1 The emergence of AI Policy and Regulation in the APEC Region

AI policy and regulation are rapidly emerging as key areas of focus in APEC economies. As AI technologies are increasingly being embedded in products, services, processes and decision making, there is a race to build guardrails for AI development and deployment to ensure responsible AI practices are developed in parallel with a rapidly accelerating AI landscape.[34] In the APEC region, principles and ethical guidelines; strategies, policies, roadmaps and regulation have all been developed in recognition of the need for frameworks to support the ethical, safe and lawful development and adoption of AI technologies. There are many additional regulatory changes coming, which will require major change for organisations across the APEC region.

In response to this momentum, we have looked at the evolving framework of policies and governance related to AI technologies among the APEC economies. Many APEC economies have already or are in the process of establishing AI roadmaps that seek to promote the benefits of AI in local economies and to stimulate local industries. While APEC economies are also beginning to consider both non-binding principles and regulatory frameworks with the aim of managing the risks of AI in their economies. In Southeast Asia, for example, ASEAN have developed a Guide on AI Governance and Ethics that provides guidance for organisations in the region that wish to design, develop, and deploy traditional AI technologies.[35] Singapore was among the world's first to articulate AI governance principles through the publication of a Model AI Governance Framework in 2019, which has been extended to cover generative AI, and seeks to present a systematic and balanced approach to address generative AI concerns while continuing to facilitate innovation. Malaysia has introduced a National AI Roadmap (AI-RMAP) aimed at making Malaysia an economy where AI augments jobs and drives economic competitiveness. Australia has also developed AI Ethics Principles and is considering developing targeted regulation to support safe and responsible AI.

We have assessed which policy and regulatory instruments exist on AI in the APEC region. We have also reviewed their purpose and objectives. It should be noted that this list is illustrative of the key policies and regulation and is not an exhaustive list.

Table 3: List of AI policies and governance in the APEC economies.

List of AI policies and governance in the APEC economies	
Australia	The foundation of Australia's policy approach to AI is set out in the **Artificial Intelligence (AI) Action Plan**[36] that was released in June 2021 and sets out a vision for Australia to be a global leader in the development and adoption of trusted, secure and responsible AI. The plan focuses on four areas: • lifting the development and adoption of AI to create jobs and boost

[34] The Commonwealth Scientific and Industrial Research Organisation (CSIRO), *National AI Centre's Responsible AI Network,* https://www.csiro.au/en/work-with-us/industries/technology/National-AI-Centre/Responsible-AI-Network.
[35] ASEAN, *ASEAN Guide on AI Governance and Ethics*, 2024, https://asean.org/wp-content/uploads/2024/02/ASEAN-Guide-on-AI-Governance-and-Ethics_beautified_201223_v2.pdf.
[36] The Australian Government, Artificial Intelligence (AI) Action Plan, June 2021, https://webarchive.nla.gov.au/awa/20220816053410/https://www.industry.gov.au/data-and-publications/australias-artificial-intelligence-action-plan.

	productivity; • growing and attracting world-class talent and expertise; • harnessing AI capabilities to solve challenges and to benefit citizens; and, • ensuring AI technologies are responsible, inclusive and reflect Australian values. The Action Plan compliments the **Australian AI Ethics Framework**[37] that was released in 2019 to guide businesses and governments developing and implementing AI in Australia. The framework includes 8 AI ethics principles that align with the OECD's AI Ethic Principles and aims to: • help reduce the risk of negative impacts from AI; and, • ensure the use of AI is supported by good governance standards in Australia. In addition to this voluntary Framework, the Australian Government is considering **regulatory approaches to AI** through its safe and responsible AI consultation held in 2023. The government has announced that it will consult on the case for a regulatory approach to AI in high-risk settings and on establishing guardrails for AI. In 2024, the Government released a **Voluntary AI Safety Standard** to support responsible and safe AI in Australia and will consult on the merits of a **voluntary labelling and watermarking scheme for AI-generated materials.** The voluntary standard gives practical guidance to all Australian organisations on how to safely and responsibly use and innovate with AI through 10 voluntary guardrails that cover the entire AI lifecycle. At a State and Territory government level, the **New South Wales (NSW) AI Assurance Framework**[38] assists agencies in NSW to design, build and use AI-enabled products and solutions. The Framework features and aligns with international standards prominently, with standards related to data, trustworthiness, use cases and specifications, computational approaches, governance and AI management systems referenced.
Brunei Darussalam	In 2023, the Government of Brunei Darussalam called upon Universiti Brunei Darussalam (UBD) and other higher learning institutions to establish **guidelines to support transparency, integrity and ethical use of AI**. The guidelines are intended to prevent the misuse of AI, while strengthening the administration of AI and supporting business and government to take advantage of AI-enabled efficiencies and productivity gains.[39] Brunei Darussalam, as a member of ASEAN, also supported the establishment on the **ASEAN Guide on AI Governance and Ethics**[40] that sets seven guiding principles (aligned with the OECD's AI Ethic Principles) for the design, development and deployment of ethical AI systems.
Canada	The key AI policy initiative in Canada is the **Pan-Canadian Artificial Intelligence Strategy**[41] that aims to drive the adoption of artificial intelligence

[37] The Australian Government, *Australia's AI Ethics Framework,* November 2019, https://www.industry.gov.au/publications/australias-artificial-intelligence-ethics-framework.
[38] NSW Government, *NSW Artificial Intelligence Assurance Framework*, https://www.digital.nsw.gov.au/sites/default/files/2022-09/nsw-government-assurance-framework.pdf.
[39] Borneo Bulletin, *Sultan calls for AI guidelines to shape smart nation*, August 22, 2023, https://borneobulletin.com.bn/sultan-calls-for-ai-guidelines-to-shape-smart-nation/.
[40] ASEAN, *ASEAN Guide on AI Governance and Ethics.*
[41] The Government of Canada, *Pan-Canadian Artificial Intelligence Strategy*, March 2017, https://ised-isde.canada.ca/site/ai-strategy/en.

	across Canada's economy and society. The Strategy has three pillars: • Commercialisation: that includes programs to enable commercialisation and adoption of AI in Canada; • Standards: that includes efforts to advance the development and adoption of standards related to AI; and, • Talent and Research: that includes initiatives that aim to attract, retain and develop AI related talent in Canada. The Government of Canada has also established the following principles and guidelines for AI use in government: • **Guiding Principles**[42] on the effective and ethical use of AI in government that include 12 actions that are aligned with the Digital Nations Shared Approach to AI and reflect core values and principles. The principles include provisions on promoting openness, prioritising the needs of individuals and communities, assessing and mitigating risk, lawfully collecting data, conducting legal or ethical impact assessments, explaining automated decisions, establishing test environments and oversight mechanisms, assessing and mitigating environmental risks, training and processes for inclusion. • **The Directive on Automated Decision-Making**[43] that aims to ensure that the government's automated decision-making systems are used responsibly and in a way that is compatible with core principles of administrative law such as transparency, accountability, legality, and procedural fairness. • **The Guide on the use of generative AI**[44] that provides guidance to federal institutions in their responsible use of generative AI, including on how to understand and define risk and approaches to determining whether to us AI tools.
Chile	The **Chilean AI Policy 2021-2030** sets Chile's approach to AI. It aims to empower citizens in the development and application of AI and to reach consensus about ethics, standards, cybersecurity and regulation between the private and public sectors for a human-centered development and use of AI. It focuses on three pillars: enabling factors; development and adoption of AI; and, ethics, regulatory aspects and socio-economic impacts. Chile is also taking steps to shape its approach to regulating AI. The Chilean parliament has begun to consider an **AI Legislation.** The AI Bill draws upon the AI Policy 2021-2030 and is also based on Europe's *2021 Artificial Intelligence Act*. It includes provisions for: • New definitions for AI; • Criteria for high-risk or unacceptable AI systems; • Establishment of a Commission for AI; • Authorization processes; and, • Financial and custodial penalties for non-compliance.[45]

[42] The Government of Canada, Guiding Principles, https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/responsible-use-ai.html#toc1.
[43] The Government of Canada, *Directive on Automated Decision-Making*, https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32592.
[44] The Government of Canada, *Guide on the use of generative AI*, https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/responsible-use-ai/guide-use-generative-ai.html#toc-4.
[45] Digital Watch Observatory, *Chile takes the first steps toward AI legislation*, 21 Jun 2023, https://dig.watch/updates/chile-takes-the-first-steps-toward-ai-legislation.

People's Republic of China	The key AI initiative in the People's Republic of China is the **National New Generational AI Development Plan**[46] that includes a broad range of initiatives and goals for R&D, industrialisation, talent development, education and skills acquisition, standards setting and regulations, ethical norms, and security. Other key policies include: • **Provisions on the Management of Algorithmic Recommendations in Internet Information Services** that regulate the use of algorithmic recommendation services in the People's Republic of China, including by setting prohibitions and requirements around application of algorithms and transparency when they are in use. • **Provisions on the Administration of Deep Synthesis Internet Information Services** that set specific prohibitions and requirements for deep synthesis service providers. • **The Governance Principles for New Generation AI – Developing Responsible AI** that provides principles for developing responsible AI with eight principles of harmony, friendliness, fairness, inclusiveness, respect for privacy, security and controllability, shared responsibility, open collaboration, and agile governance. • **The Ethical Norms for New Generation AI** that aims to integrate ethics into the entire lifecycle of AI by promoting fairness, justice and security while avoiding such problems as bias, discrimination, and privacy and information leaks. • **The Trustworthy Facial Recognition Applications and Protections Plan** that establishes trustworthy facial recognition applications and protections. • **White Paper on Trustworthy AI** that seeks to analyse credible paths to achieve controllable, reliable, transparent, and explainable AI with privacy protection, clear responsibilities, and diversity and tolerance and put forward suggestions for the future development of trustworthy AI. • **The Beijing Consensus on AI and Education** that offers guidance and recommendations on how best to harness the potential of AI technologies for achieving objectives set out in the UNESCO Education 2030 Agenda. • **The Guiding Opinions on Strengthening Overall Governance of Internet Information Service Algorithms** that aims to promote the safe, reliable, high-quality, and innovative development of algorithms.[47]
Hong Kong, China	In Hong Kong, China there are two key policies on AI. **The Guidance on the Ethical Development and Use of Artificial Intelligence**[48] aims to help organisations to understand and comply with the relevant personal data requirements when they develop or use AI. It outlines fundamental data stewardship values that should be considered when developing or using AI.

[46] State Council of the People's Republic of China, *National New Generational AI Development Plan*, https://flia.org/wp-content/uploads/2017/07/A-New-Generation-of-Artificial-Intelligence-Development-Plan-1.pdf.
[47] OECD.AI Policy Observatory, *Policies for China*, https://oecd.ai/en/dashboards/policy-initiatives?conceptUris=http:%2F%2Fkim.oecd.org%2FTaxonomy%2FGeographicalAreas%23China.
[48] Office of the Privacy Commissioner for Personal Data, *Guidance on the Ethical Development and Use of Artificial Intelligence,* https://www.pcpd.org.hk/english/resources_centre/publications/files/guidance_ethical_e.pdf.

	The Ethical Artificial Intelligence Framework[49] sets out an adoption framework for Government in considering the development and use of AI. It consists of ethical principles that are consistent with the OECD, as well as practices and assessment of AI.
Indonesia	**Indonesia's National AI Strategy from 2020 to 2045**[50] is aimed at guiding the economy in developing and adopting AI in focus sectors, including education and research, health services, food security, mobility, smart cities, and public sector reform. The focus of the strategy is to: • transform Indonesia into an innovation-based economy; • encourage AI research and industrial innovation; • improve data and data-related infrastructure; • establish ethical and relevant policies; and, • develop AI-related talents in the population. Indonesia, as a member of ASEAN, also supported the establishment on the **ASEAN Guide on AI Governance and Ethics**[51] that sets seven guiding principles (aligned with the OECD's AI Ethic Principles) for the design, development and deployment of ethical AI systems.
Japan	Japan's key AI policy is the **AI Strategy** that describes measures that Japan should take to overcome challenges in developing and using AI and opportunities to leverage its strengths to drive AI-enabled outcomes. It specifies the environment and sets out the supports conducive to effective future utilisation of AI. The Strategy is complemented by: • **The Social Principles of Human-Centric AI** that set principles for implementing AI in society. The Social Principles set forth three basic philosophies: human dignity, diversity and inclusion, and sustainability; • **The AI Utilisation Guidelines** that set voluntary consideration for AI users, especially those who provide AI services to others (AI service providers) and those who use AI systems (business users); • **The Contract Guidelines on Utilizing AI and Data** that provides a guide for businesses concluding contracts for utilisation of data or contracts for the development and utilisation of software using AI technology; • **The Guidebook on Introducing AI to SMEs** that provides a guide on how to introduce AI to SMEs; • **The Guidelines on Assessment of AI Reliability in the Field of Plant Safety** that provides a methodology for assessing AI safety and reliability in usage in petroleum and chemical plants; • **The Machine Learning Quality Management Guideline** that establishes a basis for quality for ML-based products and services. • **The Practical Guidebook on Providing Data for Employee Development in AI and Data Science** that sets out a guide on

[49] Office of the Government Chief Information Officer, *Ethical Artificial Intelligence Framework (Customised version for general reference by public)*, August 2023, https://www.ogcio.gov.hk/en/our_work/infrastructure/methodology/ethical_ai_framework/doc/Ethical_AI_Framework.pdf.
[50] OECD.AI Policy Observatory, *Policies for Indonesia*, https://oecd.ai/en/dashboards/policy-initiatives/http:%2F%2Faipo.oecd.org%2F2021-data-policyInitiatives-26968.
[51] ASEAN, *ASEAN Guide on AI Governance and Ethics.*

	employee development in AI and data science and summarises issues based on increasing benefit and risk reduction for businesses; and, • **The AI Governance in Japan 1.1** that outlines approaches to AI governance in Japan for the purpose of operationalizing the Japanese AI Principles.[52]
Republic of Korea	The Republic of Korea's **National Strategy for AI**[53] sets a strategy for the Republic of Korea to be a global leader in AI. The overarching goals include enhancing digital competitiveness, driving significant economic impact through AI, and improving the quality of life for its citizens by 2030. The strategy focuses on three major areas: • Fostering a global-leading AI ecosystem by supporting AI research, development, and innovation; • Making the Republic of Korea a leader in the practical application of AI across various sectors; and, • Realizing people-centered AI. **The Human-Centered National Guidelines for AI Ethics** provides guidance on the creation and end use of AI, focused on the proper protection of human dignity. The voluntary ethical standards recommended focus on three areas, human dignity, public benefit and the rightful purpose of technology. **The AI R&D Strategy** provides an analysis of the current state of AI technology, human resources, and infrastructure in the Republic of Korea and puts forward an AI R&D strategy to increase the economy's competitiveness in AI technology. **The Plans for the Regional Diffusion of AI** provides plans to diffuse AI across all regions and all industries in the Republic of Korea. It encourages inclusive growth and investment.[54]
Malaysia	**The Malaysia National Artificial Intelligence Roadmap 2021 – 2025 (AI-RMAP)**[55] sets out the vision for how Malaysia will responsibly develop and use AI to support competitiveness by expanding productivity and economic growth. It sets out strategies for supporting AI development and use in Malaysia, including related to establishing AI governance, advancing AI R&D, fostering AI infrastructure and talent, and kickstarting an AI innovation ecosystem. Malaysia's Ministry of Science, Technology and Innovation (MOSTI), in collaboration with Universiti Teknologi Malaysia, representatives of government agencies, higher education institutions and industry players, is developing a **code of ethics and governance for artificial intelligence (AI)**. The Code is expected to be released this year (2024).[56] Malaysia, as a member of ASEAN, also supported the establishment on the **ASEAN Guide on AI Governance and Ethics**[57] that sets seven guiding

[52] OECD.AI Policy Observatory, *Policies for Japan*, https://oecd.ai/en/dashboards/policy-initiatives?conceptUris=http:%2F%2Fkim.oecd.org%2FTaxonomy%2FGeographicalAreas%23Japan.
[53] MSIT, *the National Strategy for AI*, https://www.msit.go.kr/bbs/view.do?sCode=eng&nttSeqNo=9&bbsSeqNo=46&mId=10&mPid=9.
[54] OECD.AI Policy Observatory, *Policies for Korea*, https://oecd.ai/en/dashboards/policy-initiatives?conceptUris=http:%2F%2Fkim.oecd.org%2FTaxonomy%2FGeographicalAreas%23SouthKorea.
[55] The Malaysian Government, the Malaysia National Artificial Intelligence Roadmap 2021 – 2025 (AI-RMAP), https://airmap.my/wp-content/uploads/2022/08/AIR-Map-Playbook-final-s.pdf.
[56] CNA, *Malaysia developing AI code of ethics and governance, to be ready by 2024*, 11 Oct 2023, https://www.channelnewsasia.com/asia/malaysia-artificial-intelligence-ai-code-ethics-governance-technology-3836801.
[57] ASEAN, *ASEAN Guide on AI Governance and Ethics.*

	principles (aligned with the OECD's AI Ethic Principles) for the design, development and deployment of ethical AI systems.
Mexico	The key AI policy initiative in Mexico is the **Mexican National AI Agenda** that aims to support responsible design and use of AI in Mexico in support of economic and societal benefits. The Agenda aims to: • develop an inclusive governance framework; • identify the uses and needs of AI in industry; • open the medium and long term recommendations of the Policy Report for public consultation; • support Mexico's AI leadership in international forums; and, • promote continuity through changing administration. The agenda is complemented by: • the **AI Use Cases in the Public Sector Report** that lists different AI use cases in the Mexican public sector; • the **Principles and Impact Analysis Guide for the Development and Use of Systems Based on Artificial Intelligence in the Federal Public Administration** that provides guidance on assessing AI use and risks in the public sector; • the **Recommendations for the Processing of Personal Data Regarding the Use of Artificial Intelligence** that provides guidance on data protection principles and duties when applying AI in different sectors, including education, public security, and health; and, • the **Specific Guidelines for Compliance with the Principles and Rights that Govern the Protection of Personal Data in Artificial Intelligence Projects** that gives more detailed guidance on data protection principles and duties when applying AI in different sectors.
New Zealand	AI-focused policies in New Zealand include the **Algorithm Assessment Report**[58] that is a cross-government report of how the public sector uses algorithms to improve the lives of New Zealanders. It is focused on ensuring that the public are informed and have confidence in how the Government uses algorithms. The **Algorithm Charter for Aotearoa New Zealand**[59] that commits the New Zealand government agencies to improve transparency and accountability in their use of algorithms. The **New Zealand Principles for Safe and Effective Use of Data and Analytics**[60] have been established to assist government agencies to decision make regarding data analytics activities, including algorithmic decision-making. It supports stronger, more secure, and safer data use. The New Zealand Government is also in the process of establishing the **Cross-agency work programme on AI**[61] encompassing the public sector and wider NZ economy, addressing governance and economic and social

[58] OECD.AI Policy Observatory, *Policies for New Zealand*, https://oecd.ai/en/dashboards/policy-initiatives?conceptUris=http:%2F%2Fkim.oecd.org%2FTaxonomy%2FGeographicalAreas%23NewZealand.
[59] New Zealand Government, *Algorithm Charter for Aotearoa New Zealand*, https://data.govt.nz/assets/data-ethics/algorithm/Algorithm-Charter-2020_Final-English-1.pdf.
[60] New Zealand Privacy Commissioner, *Principles for Safe and Effective Use of Data and Analytics,* May 2018, https://www.stats.govt.nz/assets/Uploads/Data-leadership-fact-sheets/Principles-safe-and-effective-data-and-analytics-May-2018.pdf.
[61] OECD.AI Policy Observatory, *Policies for New Zealand.*

	development objectives, and security considerations.
Papua New Guinea	The Government of Papua New Guinea has established a **PNG Digital Transformation Policy**[62] to support transformation of public administration processes, culture, and citizen experiences using AI and other information and communications technology (ICT) advancement as an enabler. The Policy aims to support advancement of government service delivery on a Whole-of-Government basis. It is supported by the **Papua New Guinea Digital Government Plan 2023 – 2027**[63] that sets out a path for the delivery of digital services, resilient cyber environments, and for establishment and enforcement of digital services standards for public services in Papua New Guinea.
Peru	Peru's **National AI Strategy** aims to make Peru a leader in research, development, innovation, deployment, use, adoption of AI, and in its ethical and responsible use in the production of public and private goods and services. These efforts aim to accelerate development and promote digital inclusion while ensuring the reduction of social gaps. The Government of Peru has established **Law 31814, Law that promotes the use of artificial intelligence in favor of the economic and social development of the economy** that gives powers to the Presidency of the Council of Ministers, through the Secretariat of Government and Digital Transformation (PCM-SGTD) as the technical-regulatory authority at the economy level in charge of directing, evaluating and supervising the use and promotion of the development of AI. The law establishes that: • the use of AI will be promoted under an approach that privileges the person and human rights, guaranteeing ethical, sustainable, transparent, replicable, and responsible use; and, • AI-based systems are designed to function with different levels of autonomy.[64]
The Philippines	**The National Artificial Intelligence (AI) Strategy for the Philippines**[65] covers four important dimensions for AI readiness: • Digitisation and infrastructure; • Research and development; • Workforce development; and, • Regulation. The Roadmap provides advice on the use of AI to maintain the regional and global competitiveness of local industries, and identifies key areas for investing time and resources of government, industry and broader society. The Philippines, as a member of ASEAN, also supported the establishment

[62] The Government of Papua New Guinea, *PNG Digital Transformation Policy*, https://www.ict.gov.pg/Policies/Digital%20Transformation%20Policy/PNG%20Digital%20Transformation%20Policy_21122020_updated.pdf.
[63] The Government of Papua New Guinea, *Papua New Guinea Digital Government Plan 2023 – 2027*, https://www.ict.gov.pg/Digital%20Govt%20Plan%202023-2027/Digital%20Government%20Plan%202023-2027%20-%20Final%20Version.pdf.
[64] OECD.AI Policy Observatory, *Policies for Peru*, https://oecd.ai/en/dashboards/policy-initiatives?conceptUris=http:%2F%2Fkim.oecd.org%2FTaxonomy%2FGeographicalAreas%23Peru.
[65] Government of the Philippines, *the National Artificial Intelligence (AI) Strategy for the Philippines*, https://drive.google.com/file/d/1de5kfaGi3tdUgxu1UPV8iRxKpXECTkDp/view.

	on the **ASEAN Guide on AI Governance and Ethics**[66] that sets seven guiding principles (aligned with the OECD's AI Ethic Principles) for the design, development and deployment of ethical AI systems.
Russia	Russia's **National Strategy for the Development of AI**, released in October 2019, sets a number of qualitative goals designed to build Russia into a leading AI power. The Strategy highlights basic principles to guide Russia's development of AI. These include the protection of human rights, security, transparency, technological sovereignty, innovation cycle integrity, cost-effectiveness, and support for competition. **The Development of Artificial Intelligence Notice** establishes the MoED as the main AI policymaking body of the Russian government. It defines what "AI" means to Russia and describes the Russian government's plan to develop a robust AI industry. The plan stipulates that the Russian government will promote funding for science and technology, acquire datasets and hardware needed for AI development, formulate new methods to regulate AI, and absorb foreign capital and knowledge to accelerate the development of the Russian AI industry. **The Conceptual Framework for the Regulation of Artifical Intelligence and Robotics Until 2023** set foundations for legal regulation of the social elements emerging in connection with the development and application of systems using AI, including the creation and use of robots.[67]
Singapore	Singapore' introduced its first **National AI Strategy** in 2019[68], and refreshed this in December 2023 through the publication of its **National AI Strategy 2.0**[69] **(NAIS 2.0)**. Singapore's **NAIS 2.0** aims to harness "AI for the Public Good, for Singapore and the World". Recognising the latest AI advances, the need to anchor AI talent, resources and investments, and the growing need to ensure AI safety and security, NAIS 2.0 sets out Singapore's systems approach to AI, where it will develop peaks of excellence, while ensuring that its people and businesses are empowered to use AI with confidence and discernment. Undergirding this effort is Singapore's commitment to providing a "Trusted Environment" for AI, including through "ensuring a fit-for-purpose regulatory environment" that is regularly reviewed and updated to reflect emerging principles, concerns, and technological developments. Singapore adopts a wide range of levers to facilitate this: • Singapore issued a broad-based framework in 2019 for responsible AI use. One of the first such frameworks in the world, the **Model AI Governance Framework** provides organisations with detailed and practical guidance to address key ethical and governance issues when deploying AI solutions. Earlier this year, and keeping pace with recent developments, Singapore further extended the Model Framework beyond traditional AI to address generative AI and the novel risks it poses.

[66] ASEAN, *ASEAN Guide on AI Governance and Ethics.*
[67] OECD.AI Policy Observatory, *Policies for Russia*, https://oecd.ai/en/dashboards/policy-initiatives?conceptUris=http:%2F%2Fkim.oecd.org%2FTaxonomy%2FGeographicalAreas%23RussianFederation.
[68] The Singapore Government, *National AI Strategy 1.0: Advancing our Smart Nation Journey*, https://file.go.gov.sg/nais2019.pdf.
[69] The Singapore Government, *Singapore National AI Strategy 2.0: AI for the Public Good for Singapore and the World*, https://file.go.gov.sg/nais2023.pdf.

	• At the sectoral level, the **AI in Healthcare Guidelines** aims to support patient safety and improve trust in the use of AI in healthcare by providing AI developers and implementers with good practices to adopt when rolling out AI-augmented clinical services to patients. This set of recommendations encourages safe and responsible development and implementation of AI in healthcare and complements the Health Sciences Authority's AI-Medical Devices regulations. In addition, the **Principles to Promote Fairness, Ethics, Accountability an Transparency (FEAT)** provide guidance to firms offering financial products and services on the responsible use of AI and data analytics. • Singapore is developing technical tools that can meaningfully validate high-level principles for responsible AI at an operational level. In 2022, Singapore launched **AI Verify**, an AI governance testing framework and a software toolkit, which contains baseline standardised tests – covering 11 internationally-aligned principles such as fairness, explainability, robustness, safety, security, accountability, etc – to help companies be more transparent about their AI systems, objectively demonstrate responsible AI, and build trust in their products. Earlier this year, Singapore launched **AI Verify Project Moonshot**, which covers generative AI and evaluates the quality and safety of large language models (LLMs) and applications. • To advance AI safety R&D, Singapore has invested in Responsible AI, which includes research institutes like **AI Singapore** and the **Centre for Advanced Technologies in Online Safety**. The **Digital Trust Centre** has also recently been designated Singapore's AI Safety Institute (AISI), to work on addressing the gaps in global AI safety science, and partner with other state-backed AISIs on evaluation and testing. Singapore, as a member of ASEAN, also led the development of the **ASEAN Guide on AI Governance and Ethics**[70] that sets seven guiding principles (aligned with the OECD's AI Principles) for the design, development and deployment of ethical AI systems. At the United Nations (UN), Singapore convenes the **Forum of Small States (FOSS),** a grouping of 108 small states, and introduced a Digital pillar in 2022, where it provides baseline capacity-building for issues including AI, through initiatives like the development of an AI Governance Playbook tailored to small states.
Chinese Taipei	Chinese Taipei's key AI policies include the **Artificial Intelligence (AI) Action Plan** and the **Artificial Intelligence (AI) Action Plan 2.0** that seek to make the economy a hub of international AI innovation by fostering talent, industry development, enhancing work environments and increasing technological clout in overseas markets. Chinese Taipei is also in the process of creating an **AI Act** that covers the legal definition of AI, privacy protections, data governance, risk controls and ethical principles related to AI.[71]
Thailand	**The Thailand National AI Strategy and Action Plan** sets the framework for

[70] ASEAN, *ASEAN Guide on AI Governance and Ethics.*
[71] Lexology, *Keeping Pace with Global Trends: Chinese Taipei's Proposed Bill for Artificial Intelligence*, https://www.lexology.com/library/detail.aspx?g=a2bd13f9-dff3-4b97-ac69-f4474ec6265c.

	an effective ecosystem to promote AI development and application to enhance the economy and quality of life by 2027. It includes provisions that aim to support Thailand's readiness in social, ethics, law, standards and regulation for AI applications. **The AI Governance Guideline for Executives** aims to provide a practical and comprehensive framework for implementing AI technology in a responsible and ethical manner while maintaining business objectives.[72] **The draft Royal Decree on Artificial Intelligence System Service Business**, which was introduced in October 2022, focuses on regulating AI applications to reduce potential risks from AI systems to public health, safety, and freedoms. The framework emphasizes the importance of risk assessment, reporting requirements, and the establishment of specific measures and criteria deemed necessary to minimise AI risks. It takes a risk-based approach to regulation and specifically identifies prohibited or high-risk AI services that could cause harm. The draft AI royal decree prohibits AI systems that: • employ subliminal techniques to covertly influence human behavior (below the threshold of conscious awareness); • utilize social scoring; • access sensitive personal information like age or disabilities; or, • employ real-time remote biometric identification in public areas.[73] Thailand, as a member of ASEAN, also supported the establishment on the **ASEAN Guide on AI Governance and Ethics**[74] that sets seven guiding principles (aligned with the OECD's AI Ethic Principles) for the design, development and deployment of ethical AI systems.
The United States	The key policy approach on AI governance systems in the United States is set in **the Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence** that seeks to ensure that the US leads the way in seizing the promise and managing the risks of AI. The Executive Order seeks to: • establish new standards for AI safety and security; • protect domestic privacy; • advance equity and civil rights; • stand up for consumers and workers; • promote innovation and competition; and, • advance the US leadership around the world.[75] Other Orders that are key to US policy on AI include: • **the Executive Order on Promoting the Use of Trustworthy AI in Federal Government** that establishes guidance for Federal agency adoption of AI; • **the AI Clause in the Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal**

[72] OECD.AI Policy Observatory, *Policies for Thailand*, https://oecd.ai/en/dashboards/policy-initiatives?conceptUris=http:%2F%2Fkim.oecd.org%2FTaxonomy%2FGeographicalAreas%23Thailand.
[73] BE Laws, *Taking A Look At Thailand's New Draft AI Regulation*, May 2022, https://www.belaws.com/thailand/ai-regulation/.
[74] ASEAN, *ASEAN Guide on AI Governance and Ethics.*
[75] OECD.AI Policy Observatory, *Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence*, https://oecd.ai/en/dashboards/policy-initiatives/http:%2F%2Faipo.oecd.org%2F2021-data-policyInitiatives-27577.

	Government that places equity obligations on federal agencies that deploy AI systems, and directs agencies to prevent and remedy discrimination, including by protecting the public from algorithmic discrimination; • **the Executive Order on Maintaining American Leadership on AI** that outlines the policy of the US government to sustain and enhance the scientific, technological, and economic leadership position of the US in AI R&D and deployment through a co-ordinated Federal government strategy.[76] Key AI related US policies and strategies include: • **the National AI strategy of the USA** that is a coordinated program across the entire Federal government to accelerate AI research and application for the economy's economic prosperity and security by increasing AI research investment, establishing domestic AI research institutes, releasing AI regulatory guidance, and providing tools for researchers to leverage AI; • **the NIST Principles for Explainable AI** that provide guidance on AI systems, including expectations around delivering accompanying evidence or reasons for all their outputs, the need for meaningful evidence, and the expectation that AI systems should only be operated under the conditions under which they were designed; • **the Defense Innovation Board AI Principles** that are proposed to provide ethics for the Department of Defense for the design, development, and deployment of AI for combat and non-combat purposes; • **the Department of Defense AI Strategy** that directs the Department to deliver AI-enabled capabilities and to scale AI across the organisation; and, • **the Equal Employment Opportunity Commission's Artificial Intelligence and Algorithmic Fairness Initiative** that issues technical assistance to provide guidance on algorithmic fairness and the use of AI in employment decisions.[77] The US's approach to AI risk management is characterised as risk based, and highly distributed across agencies. The key tool in its approach is the **National AI Initiative Act (NAIIA)** that provides for federal coordination on AI research and development but leaves the power to pass independent legislation to the States. It also outlines several goals, including: • The US leadership in AI research and development, including the development and use of trustworthy AI; and, • preparation of the US workforce for the impact of AI on all sectors of the economy and society.[78]
Viet Nam	Viet Nam's **National Strategy on R&D and Application of AI**[79] promotes research, development and trusted and responsible application of AI in Viet Nam. The Strategy sets a range of targets, including targets for the development of innovative centers on AI and for big data and high-performance computing.

[76] OECD.AI Policy Observatory, *Policies for the United States*, https://oecd.ai/en/dashboards/policy-initiatives?conceptUris=http:%2F%2Fkim.oecd.org%2FTaxonomy%2FGeographicalAreas%23UnitedStates.
[77] OECD.AI Policy Observatory, *Policies for the United States.*
[78] Schwartz Reisman Institute for Technology and Society, *Discerning signal from noise*.
[79] OECD.AI Policy Observatory, *Policies for Viet Nam*, https://oecd.ai/en/dashboards/policy-initiatives?conceptUris=http:%2F%2Fkim.oecd.org%2FTaxonomy%2FGeographicalAreas%23VietNam.

	Viet Nam, as a member of ASEAN, also supported the establishment on the **ASEAN Guide on AI Governance and Ethics**[80] that sets seven guiding principles (aligned with the OECD's AI Ethic Principles) for the design, development and deployment of ethical AI systems.

4.2 AI policy and regulation and the need for consensus points

It is evident that there has been a proliferation of AI policies, roadmaps and regulation in the APEC economies as governments recognise the transformative potential of AI and grapple with the risks of its use. Each APEC member economy has developed or is developing policies or regulation to govern the use of AI technologies, often addressing concerns related to ethics, privacy, bias or security. While most APEC economies have or are in the process of developing roadmaps to support the uptake and use of AI technology to support competitive industries.

These efforts reflect that, with the rapid advancements in AI technology, there is a clear and growing need for guardrails that ensure responsible and ethical deployment of AI. However, to be effective, these policy and regulatory frameworks need to be consistent or at least be harmonised with common consensus points and norms, such as those provided by internationally agreed standards. Underpinning domestic frameworks with international standards will ensure that the different frameworks do not create impediments to business and barriers to trade. Adopting international standards in policies and underpinning regulatory frameworks with globally agreed standards will ensure global interoperability of AI systems, products and services, will enable trade and will facilitate competition and user choices.

In this increasingly complex ecosystem, international standards are vital to providing an underpinning to policy and regulatory frameworks to address the complexities that impede the scaling of AI. They provide internationally agreed frameworks for managing data quality across the AI lifecycle, as well as for managing privacy, cyber security, bias and explainability, and provide tools for oversight of AI systems and the management of risk. By adopting international standards in AI policy and regulation, APEC economies can tap into globally agreed best practice, rather than reinventing the wheel, while promoting transparency and harmonisation across the region.

[80] ASEAN, *ASEAN Guide on AI Governance and Ethics.*

5.0 Supporting AI at Scale Through International Standards

5.1 What are AI International Standards?

Nearly everything we touch and interact with is designed and developed in accordance with international standards. The International Organization for Standardization (ISO) defines a standard as:

> *As a formula that describes the best way of doing something. It could be about making a product, managing a process, delivering a service or supplying materials… Standards are the distilled wisdom of people with expertise in their subject matter and who know the needs of the organizations they represent"*[81]
>
> - *The International Organization for Standardization (ISO)*

International standards are voluntary documents that set out specifications, procedures and guidelines that aim to ensure AI products, services, and systems are safe, consistent, and reliable. They are established by a consensus of subject experts and approved by a recognised standards body. They are not made mandatory unless they are referred to in legislation, regulation or in contracts.

Up to 80 % of global trade is affected by standards or associated technical regulations.[82] For this reason, the creation and use of consistent standards, through the input of both the private sector and governments, is fundamental for the medium to long-term sustainable development of the global digital economy, including in relation to AI. The strength of the international standard system is that international standards are developed by technical experts from businesses, governments, academia, and consumer groups, from all interested economies across the world. International standards represent truly international solutions and when they are adopted by businesses and regulators, they promote harmonisation and interoperability in processes for products, services, and systems. They also support market access and help lower barriers to trade, promote convergence in regulation, provide a shared launch pad for innovation, and help manage security risks.

International standards in ICT have increased interoperability and security across technology platforms, decreased barriers to trade, ensured quality and built greater public and user trust in digital products and services.[83] Standards, including those developed through the ISO and IEC, have transformed ICT technologies from supporting interconnected and harmonised physical ports for Universal Serial Bus (USB) technology, to reducing competing systems in the shift from 3G to 4G broadband cellular network technology, and providing universally recognised cyber security certification credentials, amongst countless other applications and impacts.

For AI, international standards play a crucial role in supporting responsible behaviour in development and deployment, whether through voluntary use that can support organisations to reduce risks and utilise global best practice, or as mandatory requirements when called up

[81] The International Organization for Standardization, *"Standards"*, Accessed at 14 July 2023, https://www.iso.org/standards.html.
[82] Outsell, *"Market Size Share Forecast Trend Report 20 June 2017 – Global Standards Publishing Market 2017"*, 2017, Outsell: Burlingame, California.
[83] Standards Australia, *"An Artificial Intelligence Standards Roadmap: Making Australia's Voice Heard"*, 2020, https://www.standards.org.au/documents/r-1515-an-artificial-intelligence-standards-roadmap-soft.

in regulation or in contractual agreements.

5.2 International Standards support AI at scale

> *AI standards that articulate requirements, specifications, guidelines, or characteristics can help to ensure that AI technologies and systems meet critical objectives for functionality, interoperability, and trustworthiness—and that they perform accurately, reliably, and safely"*[84]
>
> - *National Institute of Standards and Technology (NIST)*

International standards can play a constructive role in scaling the widespread use of responsible AI in the APEC region. In the rapidly evolving ecosystem of AI technology, standards establish common building blocks for companies and policy makers, and the risk management frameworks that manage risks to individuals, organisations, and society associated with AI. They can also provide globally recognised frameworks for data quality, trustworthiness, privacy, security and ethics that AI systems can be designed, tested and validated against. [85]

International standards play a critical role in creating frameworks that set the specifications and requirements upon which new technologies can be developed, adopted and safely deployed. They provide a level playing field for AI developers and users, enabling them to build upon existing technologies and existing best practice. They also provide internationally agreed-upon principles and processes that allow consistency of products and services across borders, in doing so promoting market access, competition and innovation.

Critically, standards also can act to mitigate the risks and address the ethical concerns that are the key challenges that are impacting scale of AI in the APEC region. They support consumer and developer trust in AI by providing confidence that systems are safe, reliable and fit-for-purpose. They also provide fundamental frameworks for benchmarking and auditing systems and organisations, offering a means for conformity assessment for AI systems entering the market. In addition, standards provide comprehensive baselines that support building reliability, ethicality, and transparency in AI systems.

Standards can play a critical role in shaping the operationalisation and deployment of new AI technologies in the form of governance standards (often targeted at Board Directors and senior executives) that provide a framework for organisations to navigate the complex landscape of AI and address challenges and concerns, management systems standards that can include specific risk management frameworks and controls for use by organisations and technical standards that define technical aspects of AI systems, including their design, interoperability, performance, and security.[86]

[84] NIST, *US Leadership in AI: A Plan for Federal Engagement in Developing Technical Standards and Related Tools* 2019, p. 8.
[85] Standards Australia, *"Data and Digital Standards Landscape"* July 2022, https://www.standards.org.au/documents/data-digital-standards-landscape
[86] Standards Australia, *An Artificial Intelligence Standards Roadmap: Making Australia's Voice Heard.*

5.3 International Standards can support regulatory harmonisation

The need for standards in the AI landscape has become increasingly evident considering the growing instances of AI policy and regulation across the globe. Recent years have witnessed a flurry of principles, guidelines, roadmaps and regulations developed unilaterally and through international bodies on AI. This activity has been triggered by emerging concerns about AI ethics, security and privacy and to promote the uptake of responsible AI in economies to achieve desired societal and economic outcomes.

In the APEC region, AI policies and regulation are gaining significant attention as economies recognise the potential benefits and risks associated with AI. According to the OECD.AI Policy Observatory, as AI has gained increased attention globally, the number of policies, strategies and frameworks on AI in the APEC region has increased to over 500 separate strategies or policies.[87] In addition, it is well publicised that a number of APEC economies are considering specific regulations on AI technologies aiming to address bias, discrimination, and privacy violation risks.

These efforts are critical to supporting the responsible development and deployment of AI. However, they risk creating confusion for business and fragmenting the market if they are not underpinned by common architecture. Uncoordinated unilateral measures raise costs of digital service trade, including for AI. A recent study[88] by the Organisation for Economic Co-operation and Development (OECD) and the World Trade Organization (WTO) found that the G20 economies can achieve savings worth USD150 billion in costs by implementing the principles in the WTO Reference Paper on Services Domestic Regulation.[89] One of the key recommendations in the Reference Paper is the adoption of technical standards developed through open and transparent processes, including those in international standards-setting bodies, in services regulation.

International standards can support businesses when they are utilised as a basis for establishing common approaches to regulation or as a means to demonstrate conformance, as they reduce fragmentation and barriers to trade across borders. They also can play an important role in helping businesses and government to implement AI principles, such as the Organisation for Economic Co-operation and Development (OECD) *Principles on Artificial Intelligence* and the principles that have been developed across the APEC region often with similar content. Here, standards can provide more granular technical solutions and guidance that supports adherence to these principles within organisations.

5.4 Case studies of international standards supporting AI

Case study 1: Microsoft – International standards for responsible conversational AI

Microsoft is putting international standards into practice for responsible AI. Microsoft wants to ensure partners and customers develop and deploy chatbots and other conversational AI technologies in line with international best practice to bolster society's trust in the technology.

[87] OECD.AI Policy Observatory, *"National AI policies & strategies"*, accessed on February 2024, https://oecd.ai/en/dashboards/overview/policy.
[88] OECD/WTO, *"Services Domestic Regulation in the WTO: Cutting Red Tape, Slashing Trade Costs, and Facilitating Services Trade"*, November 2021.
[89] WTO, *"Joint Statement Initiative: Reference Paper on Services Domestic Regulation"*, INF/ SDR/2, November 2021, https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/INF/SDR/2.pdf&Open=True.

Microsoft is a platform provider and developer of computer software, hardware, and related products. One AI technology it has developed and deployed is conversational AI.

Conversational AI ranges from FAQ chatbots to virtual assistants who can assist users to complete tasks or help them make decisions based on data analysis. For example, someone might ask 'why are sales in this city lower than others?'.

Microsoft provides the building blocks for conversational AI technology through tools like the Microsoft Bot Framework. Microsoft's partners and customers then customise and deploy that technology across the intended applications where people will use the technology. Microsoft supports its partners and customers to responsibly use the conversational AI technologies it provides to them.

One way in which it does this is through applying international standards to conversational AI.

Potential impacts of using AI technologies should always be considered from the beginning, even where the AI application appears benign. For example, customer service chatbots are a common conversational AI technology unlikely to cause severe harm. However, if a business uses or manages chatbots inappropriately, it may cause negative impacts, such as:

- personal data leaks involving customer details and purchase history;
- data breaches or other risks due to inappropriate security controls; or
- discrimination or 'hate speech', for example when bots engage in 'conversation' on topics unrelated to customer service.

Microsoft and its partners use international standards to respond to these risks. To ensure responsible AI Microsoft leverages a system of standards, including:

- **Foundational standards**
  - terminology and concepts standards that support a common understanding of AI terminology and concepts
  - risk management standards that support risk management processes
  - governance standards that set out key principles and practices for responsible AI
- **Function standards**
  - data quality management to safeguard personal data
  - high quality models for AI systems to support the development of AI systems
  - AI management system standards that outlines requirements for establishing, implementing and maintaining AI systems
  - AI system impact assessment standards that provide guidance on impact assessments of AI on impacted actors
- **Measurement standards**
  - standards related to quantifying and managing unwanted bias and measuring transparency and other trust elements
  - standards related to testing of AI systems
  - audit guidance standards
  - risk management standards that support risk management processes;
  - governance standards that set out key principles and practices for responsible AI

Through adhering to and promoting the adoption of these standards, Microsoft reported that they are helping to define and consider behaviours for good actors in AI technology. Standards support Microsoft to undertake efficient contracting and promote supply chain trust. They also support efficient development and deployment of AI technology and facilitate cross-border commerce.

Case study 2: Standards and the Malaysian Artificial Intelligence Roadmap 2021 – 2025 (AI-RMAP)

The National Artificial Intelligence Roadmap (AI-Rmap) describes how Malaysia's AI capabilities will be harnessed, catalysed and propelled within the next 5 years, from 2021 until 2025.

The main goal of AI-Rmap is to create a thriving and sustainable AI innovation ecosystem that will make Malaysia a high-technology and high-income economy by exploiting AI. The 5-year goal under AI-Rmap is to create a self-sustaining AI Innovation Ecosystem for AI development, guided by responsible AI principles and international standards.

The AI-Rmap sets a path for Malaysia to achieve the following:

- Establish AI governance through clear AI policy and collective action.
- Advance AI R&D.
- Escalate digital infrastructure to enable AI through initiatives that support technologies needed to sustain AI.
- Foster AI talents.
- Acculturating AI to get support for the transformation process.
- Kick-starting the AI innovative ecosystem in Malaysia through an AI Innovation Hub.

AI-Rmap also sets Principles for Responsible AI:

1. Fairness
2. Reliability, safety and control
3. Privacy and security
4. Inclusiveness
5. Transparency
6. Accountability
7. Pursuit of human benefit and happiness

In implementing the AI-Rmap, the Malaysian Government reports that key challenges to AI adoption in Malaysia are that concerns around the risks that AI can pose to society. AI is advancing rapidly and AI innovations accelerating. AI systems are complex, and there is a need to maintain a human centric approach to developing and adopting the technology.

In response to these challenges, the Malaysian AI Principles provide guardrails for acceptable use of AI in Malaysia. However, it has been found that the principles are too generic and that there is requirement for additional frameworks to support implementation.

International standards are seen as this additional support and are being adopted to support the AI-Rmap and the Malaysian AI Principles. It is considered that international standards:

- support a balanced approach to implementation and adoption, while considering risks;
- are the appropriate tools to become guardrails and best practice for AI in Malaysia; and,
- provide deeper guidance on best practice implementation of the disciplines defined in the Malaysian AI principles.

In support of AI-Rmap, Malaysia is adopting and promoting the adoption and implementation of international standards to promote implementation of global best practice as defined by the international standards community. Malaysia's AI Technical Committee (TC 17) was

established in 20 June 2023 to mirror the work of ISO/IEC JTC 1 SC 42, the preeminent international AI standards setting committee.

TC 17 is focused on adopting ISO/IEC JTC 1/SC 42 standards of interest to support the ambitions of the AI-Rmap, with an initial focus on adopting:

- **ISO/IEC 22989:2022 – Information technology – Artificial intelligence – Artificial intelligence concepts and terminology:** that establishes terminology for AI and describes concepts in the field of AI.
- **ISO/IEC 23053:2022 – Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML):** that establishes an Artificial Intelligence (AI) and Machine Learning (ML) framework for describing a generic AI system using ML technology.
- **ISO/IEC 42001:2023 – Information technology – Artificial Intelligence Management system:** that specifies requirements for establishing, implementing, maintaining, and continually improving an Artificial Intelligence Management System (AIMS) within organizations.

Case study 3: SCC's Accreditation Pilot for AI Management Systems

In 2022 the Standards Council of Canada (SCC) established the first-of-its-kind pilot to define and test requirements for a conformity assessment program for AI management systems. Certification to national and international standards for AI management systems will allow organizations to prove their dedication to responsible use of AI, raising the confidence of customers and partners in their operations.

The first stage of the pilot involved one conformity assessment body and one AI developer/user, assessing against the ISO/IEC 42001:2023 – Information technology – Artificial intelligence Management System (AIMS) standard requirements for AI management systems as well as the Algorithmic Impact Assessment (AIA) developed by Treasury Board of Canada Secretariat.

ISO/IEC 42001 provides guidance for organisations to develop trustworthy AI management systems. It supports responsible development, deployment and operation of AI by covering requirements for organisations to build risk management, AI system impact assessment and system lifecycle management.

Critically, it sets out a structured way to manage risks and opportunities associated with AI, balancing innovation with governance and sets a pathway to certification of trustworthy AI. To allow for certification to the AIMS standard, conformity assessment bodies need to be accredited to having the technical capability to perform their function.

Ernst & Young LLP (EY Canada) are the first conformity assessment body participating in the SCC initiative. They will play a key role in the standardisation process by leveraging the AIMS standard to certify the management system of an AI developer/user. As they test the application of these requirements, SCC are overseeing activities and progress to develop an effective accreditation program for conformity assessment bodies in the future.

ISO/IEC 42001:2023 – Information technology – Artificial intelligence Management system – the pathway to AI safety

ISO/IEC 42001 is an international standard that specifies requirements for establishing, implementing, maintaining, and continually improving an Artificial Intelligence Management System (AIMS) within organisations. It is designed for entities providing or utilising AI-based products or services, ensuring responsible development and use of AI systems.

is the world's first AI management system standard, providing valuable guidance for this rapidly changing field of technology. It addresses the unique challenges AI poses, such as ethical considerations, transparency, and continuous learning. For organisations, it sets out a structured way to manage risks and opportunities associated with AI, balancing innovation with governance.[90]

ISO/IEC 42001 requires organisations to:

- determine the scope of applicability of the AI management system;
- support the AI system development process by maintaining high standards for continual improvement and maintenance and to monitor the performance of the AI management system; and,
- make continuous improvement to the system based on previous observations and implementing corrective actions.

It includes controls related to risk management, AI impact assessment, system lifecycle management, performance optimization and supplier management, and will allow for certification against globally recognised management system processes.

ISO/IEC 42001 exists to help businesses and society at large safely and efficiently derive the maximum value from their use of AI. It lays the foundation for an ethical, safe resuponsible use of AI across its various applications.

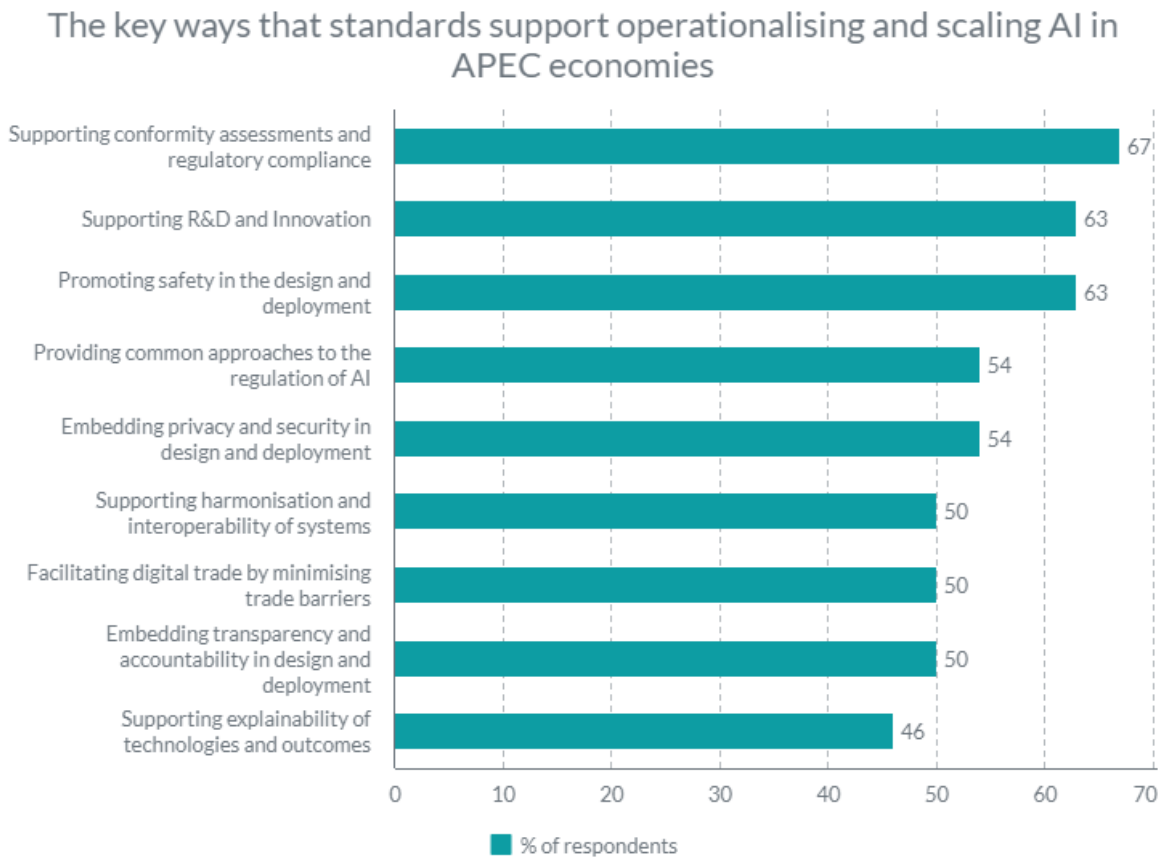
5.5 Supporting AI at scale in the APEC Region through International Standards survey results

AI standards can support AI at scale by promoting responsible behaviour in development and deployment of AI. To determine how standards are being used in the APEC region, the APEC-wide survey on Supporting AI at Scale in the APEC Region Through International Standards asked respondents to provide input on the ways that standards support operationalising and scaling AI in their APEC economy (multiple answers were allowable).

See Figure 2 below for the full results.

Figure 2: The key ways that standards support operationalising and scaling AI in APEC economies. Source Supporting AI at Scale in the APEC Region Through International Standards Survey.

[90] ISO, *ISO/IEC 42001:2023*, https://www.iso.org/standard/81230.html.



The survey found that the main areas where standards are supporting AI to scale in APEC include by supporting conformity assessments and regulatory compliance (67%), by supporting R&D and innovation (63%), by promoting safety and trust in the design and deployment of technologies (63%), by providing a basis for establishing common approaches to the regulation of AI (54%) and by embedding privacy and security in the design and deployment of technologies (54%).

Other ways where standards are supporting operationalising and scaling AI in APEC economies include by supporting harmonisation and interoperability of systems (50%), facilitating digital trade by minimising trade barriers (50%), by embedding transparency and accountability in design and deployment (50%), and supporting explainability of technologies and outcomes (46%).

6.0 The International AI Standards Landscape

6.1 International AI Standards

A number of international SDOs are developing and publishing AI standards. The standards that are being developed are typically related to:

- identifying foundational areas for ongoing technical definition and refinement;
- codifying existing good practice(s), drawing on broader ICT standards; and,
- engaging and responding to questions of ethics and responsible development, deployment, use and evaluation of AI.[91]

In order to support the public and private sector in the APEC region to gain a greater understanding of the landscape of international standards for AI, this section summarises the international standards ecosystem for AI, including completed standards and work underway within key SDOs. Specifically, it focuses on ISO/IEC JTC 1/SC 42 Artificial Intelligence, and other multinational SDOs.

6.2 OECD AI Principles

The OECD Principles on Artificial Intelligence promote AI that is innovative, trustworthy and respects human rights and democratic values. They were adopted in May 2019 by OECD member economies when they approved the OECD Council Recommendation on Artificial Intelligence. The OECD AI Principles identify five values-based principles for the responsible stewardship of trustworthy AI. These high-level principles are:

- AI should benefit people and the planet by driving inclusive growth, sustainable development and well-being.
- AI systems should be designed in a way that respects the rule of law, human rights, democratic values and diversity, and they should include appropriate safeguards – for example, enabling human intervention where necessary – to ensure a fair and just society.
- There should be transparency and responsible disclosure around AI systems to ensure that people understand AI-based outcomes and can challenge them.
- AI systems must function in a robust, secure and safe way throughout their life cycles and potential risks should be continually assessed and managed.

Consistent with these principles, the OECD also provides recommendations to government to support the adoption of these principles. Amongst these recommendations is encouragement for governments to “promote the development of multi-stakeholder, consensus-driven global technical standards for interoperable and trustworthy AI”.[92]

6.3 The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC)

In 2017, the ISO and the IEC created a joint technical committee on AI: ISO/IEC JTC 1/SC 42 (SC 42) that is tasked with developing international standards for AI.

To undertake its work SC 42 takes a comprehensive look at the ecosystem in which AI

[91] Standards Australia, *An Artificial Intelligence Standards Roadmap: Making Australia’s Voice Heard.*
[92] Organization for Economic Co-operation and Development, *Principles on Artificial Intelligence*, 2019.

systems are developed and deployed. By looking at the context of use of the technology, such as application domain, business, societal and regulatory requirements, SC 42 develops horizontal standards for applications that address areas such as data quality, privacy, security, trustworthiness and ethics.

The standards under development in SC 42 are managed by working groups that focus on delivering horizontal standards in areas including foundational standards, data, trustworthiness, use cases and applications, and computational approaches. The core of the committee's work is to develop guidance on foundational standards that establish underpinning concepts and terminologies, data standards that address data governance and management, model standards that define structure and support interoperability and compatibility and organisational standards that provide tools for oversight of AI systems and the management of risk.

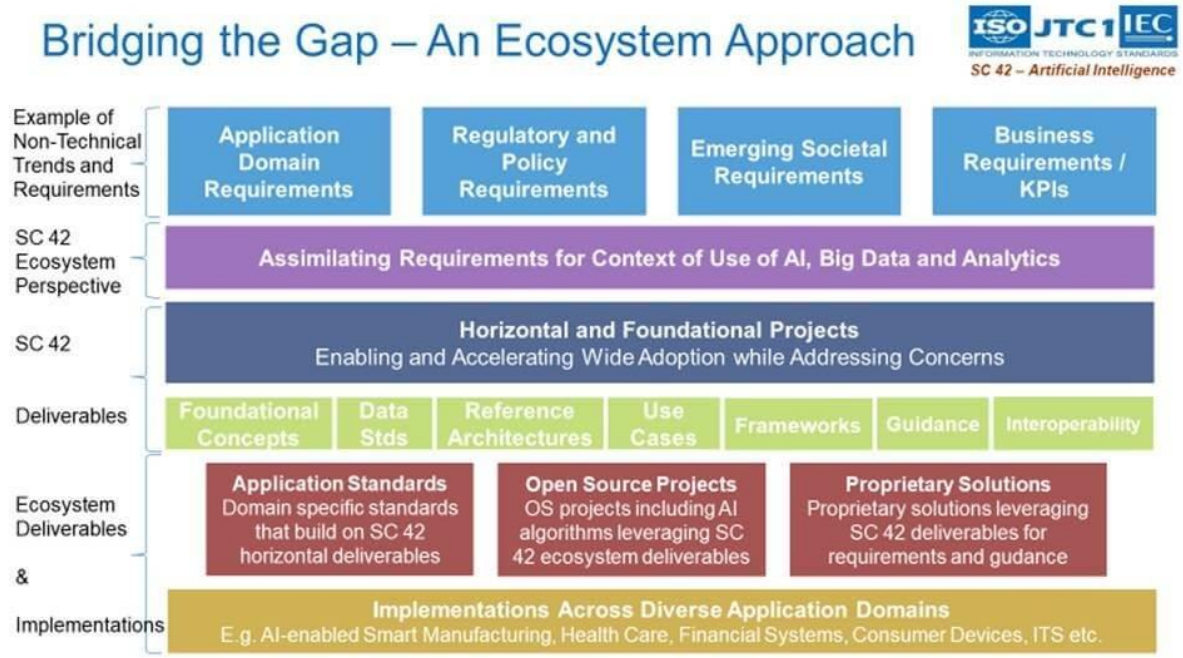


Figure 3: *SC 42 – An Ecosystem Approach. Source the American National Standards Institute.*[93]

At the time of writing, SC 42 is made up of 39 participating members and 25 observing members and has published 27 standards with a further 30 under development. Figure 4 represents the suite of ISO/IEC AI standards, including those in development.

[93] ANSI, *"Speaking The Same Ai Language Starts With Standardization"*, December 2022, Speaking the Same AI Language Starts with Standardization: Q&A with Wael William Diab, chair of ISOIEC JTC 1SC 42 (ansi.org).

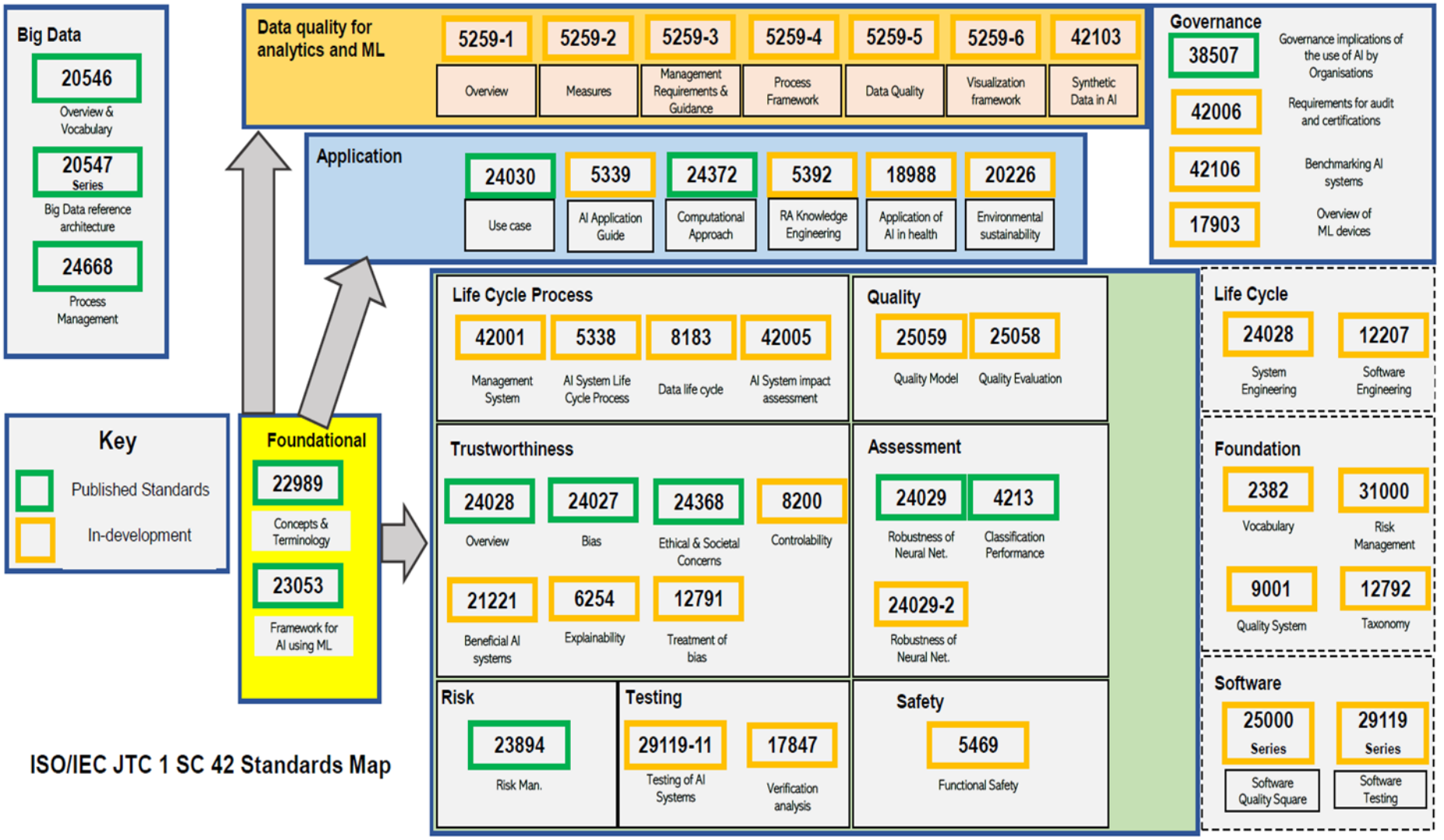


Figure 4: *ISO/IEC JTC 1 SC 42 Standards Map, as at January 2024.*

Figure 5. *Key ISO/IEC JTC 1 SC 42 Publications that support AI at scale, as of January 2024. Source Ethical AI Consulting.*

	Publications that support AI at scale
Data	**ISO/IEC 5259 series (Under development)** This set of standards will provide tools and methods to assess and improve the quality of data used for analytics and machine learning. The series includes guidelines for data governance, data quality assessment, measurement, and improvement for both training and operation.
Data	**ISO/IEC 8183:2023 Information technology — Artificial intelligence (AI) — Data life cycle framework** This standard defines the stages and identifies associated actions for data processing throughout the AI system life cycle, including acquisition, creation, development, deployment, maintenance and decommissioning.
Data	**ISO/IEC 12791 Information technology — Artificial intelligence — Treatment of unwanted bias in classification and regression machine learning tasks (Under development)** This standard will provide mitigation techniques that can be applied throughout the AI system life cycle in order to treat unwanted bias. This document describes how to address unwanted bias in AI systems that use machine learning to conduct classification and regression tasks.
Model	**ISO/IEC 23053:2022 Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML)** This standard establishes an AI and Machine Learning (ML) framework for describing a generic AI system using ML technology. The framework describes the system components and their functions in the AI ecosystem. This document is applicable to all types and sizes of organisations, including public and private companies, government entities, and not-for-profit organisations, that are implementing or using AI systems.
Model	**ISO/IEC TR 24028:2020 Information technology — Artificial intelligence (AI) — Overview of trustworthiness in artificial intelligence** This standard provides guidance related to trustworthiness in AI systems. It includes guidance on approaches to establish trust in AI systems through transparency, explainability and controllability; engineering pitfalls and typical associated threats and risks to AI systems, along with possible mitigation techniques and methods; and approaches to assess and achieve availability, resilience, reliability, accuracy, safety, security and privacy of AI systems.
Model	**ISO/IEC TR 24372:2021 Information technology — Artificial intelligence (AI) — Overview of computational approaches for**

	AI systems This document provides an overview of the state of the art of computational approaches for AI systems, by describing: a) main computational characteristics of AI systems; b) main algorithms and approaches used in AI systems.
Model	**ISO/IEC 6254 Information technology — Artificial intelligence (AI) — Objectives and approaches for explainability of ML models and AI systems (Under development)** This document will describe approaches and methods that can be used to achieve explainability objectives of stakeholders with regards to ML models and AI systems‘ behaviours, outputs, and results.
Model	**ISO/IEC TR 5469:2024 Artificial intelligence — Functional safety and AI systems** This technical report (TR) will cover the characteristics, potential hazards, and techniques and processes associated with the implementation of AI within safety-critical operations, the use of non-AI safety measures to guarantee safety for equipment controlled by AI, and the use of AI systems to create and develop safety-related functions.
Model	**ISO/IEC 8200:2024 Information technology — Artificial intelligence — Controllability of automated artificial intelligence systems** This document will define a basic framework with principles, characteristics and approaches for the realisation and enhancement for automated AI systems’ controllability.
Model	**ISO/IEC 5392:2024 Information technology — Artificial intelligence — Reference architecture of knowledge engineering** This standard will define a reference architecture of Knowledge Engineering (KE) in AI. The reference architecture describes KE roles, activities, constructional layers, components and their relationships amongst themselves and other systems from systemic user and functional views.
Model	**ISO/IEC 5338:2023 Information technology – Artificial intelligence – AI system life cycle processes** This document provides processes that support the definition, control, management, execution and improvement of the AI system in its life cycle stages. These processes can also be used within an organisation or a project when developing or acquiring AI systems.
Organisation	**ISO/IEC 42001:2023 Information technology — Artificial intelligence (AI) — Management system** This standard will provide a framework for a management system that an organisation can follow to meet its AI objectives using good practice. The standard takes a risk-based approach and targets AIMS, outlining guidelines for measuring effectiveness and

	efficiency of these systems, as well as for the responsible development and use of such systems that meet applicable regulatory requirements. It is designed to be auditable and is expected to be a pathway to certification.
Organisation	**ISO/IEC 22989:2022 Information technology — Artificial intelligence — Artificial intelligence concepts and terminology** This document establishes terminology for AI and describes concepts in the field of AI. This document can provide organisations with a better understanding of AI and can support them to consider AI initiatives. It also supports communications among diverse, interested parties or stakeholders by providing a common understanding of AI, and its concepts and terminology.
Organisation	**ISO/IEC 23894:2023 – Information technology – Artificial intelligence – Guidance on risk management** This document provides guidance on how organizations that develop, produce, deploy or use products, systems and services that utilise AI can manage risk specifically related to AI.
Organisation	**ISO/IEC 5339 Information technology — Artificial intelligence — Guidance for AI applications** This document provides guidance for identifying the context, opportunities and processes for developing and applying AI applications.
Organisation	**ISO/IEC 22989:2022 Information technology — Artificial intelligence — Artificial intelligence concepts and terminology** This document establishes terminology for AI and describes concepts in the field of AI. This document can provide organisations with a better understanding of AI and can support them to consider AI initiatives. It also supports communications among diverse, interested parties or stakeholders by providing a common understanding of AI, and its concepts and terminology.
Organisation	**ISO/IEC TR 24027:2021 Information technology — Artificial intelligence (AI) — Bias in AI systems and AI aided decision making** This standard provides guidance on how organisations that develop, produce, deploy systems and services that utilise AI can manage risk specifically related to AI. The guidance also aims to assist organisations to integrate risk management into their AI-related activities and functions. It describes processes for the effective implementation and integration of AI risk management and its application can be customised to any organisation and its context.
Organisation	**ISO/IEC TR 24368:2022 Information technology — Artificial intelligence — Overview of ethical and societal concerns** This standard provides a high-level overview of AI ethical and societal concerns. It also provides information in relation to principles, processes and methods in this area, including an overview of International Standards that address issues arising from AI ethical and societal concerns.

Organisation	**ISO/IEC 42005 Information technology — Artificial intelligence — AI system impact assessment (Under development)** This document will provide guidance for organisations performing AI system impact assessments for individuals and societies that can be affected by an AI system and its intended and foreseeable applications.

6.2 The Institute of Electrical and Electronics Engineers Standards Association (IEEE)

The Institute of Electrical and Electronic Engineers Standards Association (IEEE SA) is a globally recognised standards development organisation with international membership that is focused on developing standards that advance technology and technological innovation. The IEEE has 40,000 individual experts who create standards in engineering, computing and information technology.

The IEEE has undertaken significant work in developing AI standards in several key areas, including ethics, transparency, accountability, and interoperability. This includes the release of a number
of documents regarding the ethical design and development of AI through their Global Initiative on Ethics of Autonomous and Intelligent Systems. They aim to address the challenges and concerns associated with AI, such as bias, fairness, privacy, and algorithmic transparency.

The IEEE's P7000™ series of standards includes a number of specific standards that address different aspects of AI design, development and evaluation. Key IEEE Standards that have been developed or are under development in relation to ethical AI are listed below.

Figure 6. *Key IEEE publications and initiatives that support AI at scale*

IEEE 2089-2021 IEEE Standard for an Age Appropriate Digital Services Framework Based on the 5Rights Principles for Children

A set of processes by which organizations seek to make their services age appropriate is established in this standard.

IEEE SA P2863 – Recommended Practice for Organizational Governance of Artificial Intelligence

This standard provides a framework of recommended practice and outlines criteria for trustworthy AI, such as transparency, accountability, and safety. It also provides guidance on how to responsibly develop or use AI, such as auditing, training, and complying with regulations.

IEEE 7010-2020: IEEE Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Well-Being

This recommended practice provides specific and contextual well-being metrics that facilitate the use of a Well-Being Impact Assessment (WIA) process in order to proactively increase and help safeguard human well-being throughout the lifecycle of autonomous and intelligent systems (A/IS).

IEEE 7000-2021: IEEE Standard Model Process for Addressing Ethical Concerns during System Design

This standard provides a model process for addressing ethical concerns during AI system design. It provides a clear methodology to analyse human and social values for an ethical system engineering effort. The standard establishes a set of processes enabling organisations to include consideration of human ethical values in the design of AI and AI systems.

This standard has been adopted as ISO/IEC/IEEE 24748-7000:2022 - Systems and

software engineering — Life cycle management — Part 7000: Standard model process for addressing ethical concerns during system design.

IEEE 7001-2021: Standards for Transparency of Autonomous Systems

That describes specific, measurable levels of transparency that can be assessed objectively, and identifies various levels of compliance that can be determined during system design.

IEEE 7002-2022 IEEE Standard for Data Privacy Process

This standard defines the requirements for a systems/software engineering process for privacy-oriented considerations regarding products, services, and systems utilizing employee, customer, or other external user's personal data.

IEEE P7003 Standard for Algorithmic Bias Considerations (Under development)

This standard will provide individuals or organisations creating algorithmic systems with development framework to avoid unintended, unjustified and inappropriately differential outcomes for users.

7005-2021 - IEEE Standard for Transparent Employer Data Governance

This standard describes specific methodologies to help employers in accessing, collecting, storing, utilizing, sharing, and destroying employee data.

IEEE 7007-2021 IEEE Ontological Standard for Ethically Driven Robotics and Automation Systems

A set of ontologies with different abstraction levels that contain concepts, definitions, axioms, and use cases that assist in the development of ethically driven methodologies for the design of robots and automation systems is established by this standard.

IEEE P3119 Standard for the Procurement of Artificial Intelligence and Automated Decision Systems (Under development)

This standard will establish a uniform set of definitions and a process model for the procurement of Artificial Intelligence (AI) and Automated Decision Systems (ADS) by which government entities can address socio-technical and responsible innovation considerations to serve the public interest.

IEEE P7009 -Standard for Fail-Safe Design of Autonomous and Semi-Autonomous Systems (Under development)

This standard will establish a practical, technical baseline of specific methodologies and tools for the development, implementation, and use of effective fail-safe mechanisms in autonomous and semi-autonomous systems.

IEEE CertifAIEd™

IEEE CertifAIEd is a certification program for assessing ethics of Autonomous Intelligent Systems (AIS) to help protect, differentiate, and grow product adoption. The resulting certificate and mark demonstrates the organisation's effort to deliver a solution with a more trustworthy AIS experience to their users. The Mark helps organisations to demonstrate that they are addressing four key areas: transparency, accountability, algorithmic bias, and privacy.

First level criteria for CertifAIEd are available below. These are a small subset of the licenced set of criteria available during assessment.

- IEEE CertifAIEd Ontological Specification for Ethical Transparency

- IEEE CertifAIEd Ontological Specification for Ethical Privacy
- IEEE CertifAIEd – Ontological Specification for Ethical Algorithmic Bias
- IEEE CertifAIEd - Ontological Specification on Ethical Accountability

The IEEE Applied Artificial Intelligence Systems (AIS) Risk and Impact Framework Initiative (Under development)

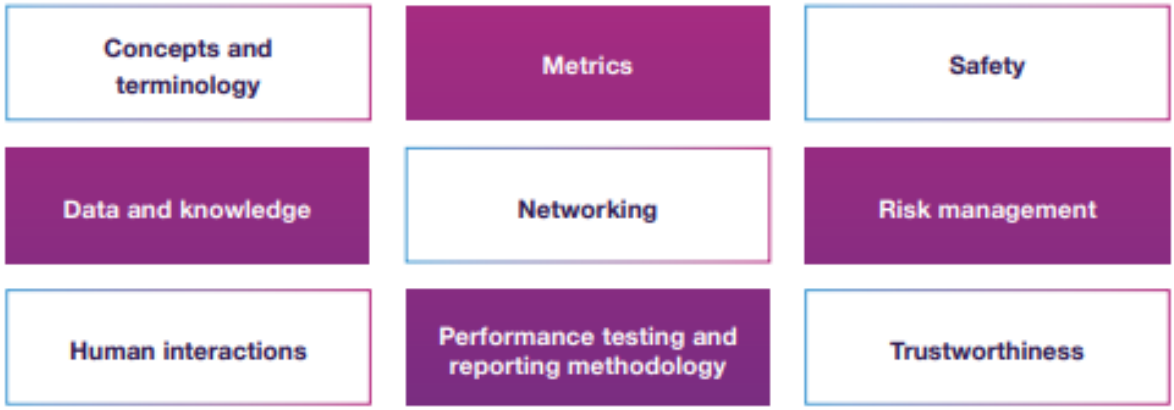
This initiative will provide a risk assessment and mitigation paradigm based on previous models but tailored to AI. It will identify existing risk approaches (in the fields of finance and cybersecurity) as well as gaps, to create an AI risk assessment for risk management.

6.3 The National Institute of Standards and Technology (NIST)

The National Institute of Standards and Technology (NIST) was founded in 1901 and is now part of the U.S. Department of Commerce. In its role as federal AI standards coordinator, NIST leads and participates in the development of technical standards, including international standards, that promote innovation and public trust in systems that use AI.

NIST aims to cultivate trust in the design, development, use and governance of AI technologies and systems in ways that enhance safety and security and improve quality of life. NIST focuses on improving measurement science, technology, standards and related tools — including evaluation and data.

NIST focus areas for standards development include[94]:



One of NIST's focus areas is aligning the NIST AI RMF Roadmap and related guidance with applicable international standards, guidelines, and practices. The roadmap specifically cites *"Alignment with International Standards and production crosswalks to related standards (e.g., ISO/IEC 5338, ISO/IEC 38507, ISO/IEC 22989, ISO/IEC 24028, ISO/IEC DIS 42001, and ISO/IEC NP* 42005)."

On 26 January 2023, NIST released the AI Risk Management Framework (AI RMF 1.0)[95] along with a companion NIST AI RMF Playbook[96]. The AI RMF 1.0 is designed to equip organisations and individuals with approaches that increase the trustworthiness of AI

[94] NIST, *"US Leadership in AI: A Plan for Federal Engagement in Developing Technical Standards and Related Tools"*, 2019, US Department of Commerce.
[95] NIST, *AI Risk Management Framework (AI RMF 1.0)*, https://nvlpubs.nist.gov/nistpubs/ai/NIST.AI.100-1.pdf.
[96] NIST, *NIST AI RMF Playbook*, https://airc.nist.gov/AI_RMF_Knowledge_Base/Playbook.

systems, and to help foster the responsible design, development, deployment, and use of AI systems over time. It includes guidance on:

- Framing AI risk.
- Analysis of AI risks and trustworthiness.
- Specific functions to help govern and address risk.

The AI RMF Playbook provides suggested actions for achieving the outcomes laid out in the AI RMF 1.0. These suggestions are voluntary and actors can choose to apply as many as are relevant to their industry use case or interests.

6.4 CEN/CENELEC

The European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC) are two distinct private international non-profit organizations. There are 200,000 technical experts from industry, associations and public administrations who come from 34 Member Economies and relevant government bodies.

ISO/IEC have recently established the “Vienna Agreement” which secures collaboration between CEN-CENELEC and ISO/IEC JTC 1/SC 42 for the development of joint standards activities. This agreement supports the uplift of AI standards by establishing new joint projects and working groups,
agreeing to incorporate ISO/IEC standards into the European Union’s AI Act and streamlining the adoption of existing CEN and ISO/IEC publications. This collaboration will look to promote global uptake and harmonization of both product types.

6.5 European Telecommunications Standards Institute

ETSI is a European Standards Organization (ESO) with an international membership. They are the regional standards body for telecommunications, broadcasting and other electronic communications networks and services. ETSI has 60 members economies and 900 organisations. Key AI Standards include:

ETSI GR SAI 009 – Artificial Intelligence Computing Platform Security Framework

This standard sets out a reference security framework for AI computing platform developer and users to mitigate the security threats against AI systems in a cooperatively manner. It considers:

- the role of AI computing platform in AI systems, its common structure and security requirements in AI systems;
- the security components and interaction between these components that form the security framework of AI computing platform; and,
- the mechanisms which guarantee the security of the platform itself and provide services for relevant stakeholders in AI systems are studied in detail.

ETSI GR SAI 001 – AI Threat Ontology

This standard addresses the issue that there is no common understanding of what constitutes an attack on AI systems.

ETSI GR SAI 001 defines what qualifies as an AI threat and distinguishes it from threats to traditional systems. The ontology aligns terminology across stakeholders and industries.

7.0 Recommendations to support AI at scale in the APEC region

The responders to the project survey and the participants in the *Supporting AI at Scale in the APEC Region Through International Standards* identified a range of recommendations to support AI at scale in the APEC region through international standards.

These recommendations reflect the diverse roles played by the representatives that participated in this project. While these recommendations have been grouped by key actors, some are more suited to joint efforts by multiple actors, such as governments, the private sector and SDOs working together to support engagement in AI standards development and adoption.

7.1 Regional level recommendations

1. **APEC SCSC to encourage and support APEC economies to participate in the development and adoption of AI international standards.**
   Only 10 APEC member economies are participating members of JTC 1 ISO/IEC SC 42 – the international standards setting committee that is focused on AI standards development. The strength of the multilateral, international standards setting system is that it is a transparent process that supports participation. Actively participating in the process is necessary to have an economies voice heard. It is recommended that the APEC SCSC work with members to encourage and support their participation in the development and adoption of AI international standards to ensure that those standards are practical and relevant to the APEC regions needs, for example by participating in JTC 1 ISO/IEC SC 42.

2. **APEC SCSC to facilitate sharing of information on AI standards and their use in policies and regulatory settings in APEC economies to support harmonised approaches, best practice and successful models being adopted.**
   This Report found that APEC member economies have established numerous policies and are considering regulatory settings for AI. It is recommended that APEC SCSC facilitates discussions on AI standards and their use in domestic frameworks to support harmonisation of approaches and adoption of best practices.

3. **Develop a comprehensive international and APEC economy-specific AI standards mapping to identify opportunities for harmonisation and to support the private and public sector to adopt and implement relevant standards.**
   A comprehensive mapping of the international and APEC economy-specific AI standards will increase transparency and support gap and harmonisation analysis. It would also support AI actors to identify relevant standards for adoption and implementation.

4. **Develop an APEC Guideline and Best Practice for the adoption of AI international standards to assist APEC members, policymakers, regulators and industry to adopt and implement standards to support responsible design and use of AI in APEC economies.**
   An APEC Guideline and Best Practice for the adoption of AI international standards would assist AI actors to decision make in relation to adopting international standards to support responsible AI. It would also facilitate alignment of regional developments and best practices related AI development and deployment through harmonised standards adoption and implementation processes.

5. **Develop guidance and training materials to support the public and private sector in the APEC region to adopt and implement AI international standards in support of responsible design and use of AI.**
   Guidance and training materials would support member governments and the private sector in the APEC region to adopt and implement AI international standards. Ultimately, this would support responsible design and use of AI in the region.

6. **Provide capacity building to APEC economies to support them to adopt and implement international standards as per the APEC Guideline and Best Practice for the adoption of international standards.**
   This could include providing training and technical assistance to member governments and businesses within the APEC region to support them to adopt international standards to meet their organisational goals.

7.2 APEC member economy recommendations

7. **Increase participation and support business participation in developing AI standards in international standards bodies.**
   It is recommended that APEC member economies increase their participation in the development of AI standards, ensuring these standards are practical and relevant to their economies needs. Increased involvement, for example through participation in ISO technical committees, ensures that the standards developed are grounded in practicality and feasibility, leading to wider acceptance and implementation.

8. **Develop comprehensive roadmaps and guidelines that identify and adopt relevant international standards to support responsible design and use of AI.**
   Identify and adopting relevant international standards to support responsible design and use of AI in roadmaps and guidelines will support underpinning economy-level frameworks with international standards and norms. This will act to promote harmonisation and interoperability across policy frameworks in the APEC region.

9. **Use international standards as a basis for establishing or as a means to demonstrate conformance to AI regulation.**
   It is recommended that international standards are used as a basis for establishing or as a means to demonstrate conformance to any AI regulation that is developed in the APEC region, where it is appropriate to do so. This will act to promote harmonisation and interoperability across jurisdictions in the APEC region.

10. **Invest in capacity building and training for public and private sector to adopt and implement AI international standards.**
    It is recommended that APEC members support providing training and technical assistance to their public and private sector stakeholders on AI international standards and their benefits. This will promote greater adoption of standards that can support responsible use and deployment of AI.

11. **Raise awareness among the public regarding the benefits and risks of AI, and how international standards can support mitigating risks.**
    Raising awareness of the benefits and the risks of AI, as well as how international standards can support mitigating risks will reduce misconceptions and build trust in AI. It is recommended that APEC member economies run awareness campaigns to support responsible use and deployment of AI.

7.3 Private sector recommendations

12. **Increase participation in developing AI standards in international standards bodies.**
    It is recommended that the private sector increase their participation in the development of AI standards, ensuring these standards are practical and relevant to their needs. Increased industry involvement, for example through participation in ISO technical committees, ensures that the standards developed are grounded in practicality and feasibility, leading to wider acceptance and implementation.

13. **Conduct an internal gap analysis and review mapping of AI standards and identify the standards that can support business efficiencies and ambitions, and/or assist with adhering to regulatory or contractual requirements.**
    It is recommended that the private sector consider implementing the standards that are included in this report that are relevant to their interests, use cases and needs. Efficiencies may be found in doing so. Additionally, adhering to these standards may assist with adhering to regulatory or contractual requirements.

14. **Align business practice with relevant standards to support responsible design and use of AI.**
    It is recommended that the private sector in APEC member economies align their business practice with relevant standards, such as ISO/IEC 42001, to support responsible design and use of AI.

15. **Attend capacity building and training on AI standards to increase understanding and support implementation, where there is interest.**
    It is recommended that interested members of the private sector seek out capacity building and training on AI standards, where it is available to them. This will support them to decision make around adoption, and to implement relevant standards.

8.0 Conclusion

This Recommendations Report sets out key recommendations for actions that will support AI at scale in the APEC region through developing, adopting and implementing international standards. It is an important step in the ongoing efforts to develop and promote the APEC region's readiness to capitalise on AI. The Report provides an overview of the key barriers to operationalising AI and details how international standards can support responding to these barriers to enable responsible scaling of AI development and deployment in the APEC Region.

AI is everywhere. It is becoming more embedded in our lives every day – from facial recognition systems that unlock our smartphones, to AI systems that are used to recommend our favourite music, movie or to help us drafts emails faster, to systems that are used to detect cancer or find a vaccine against covid. There are countless and increasingly applications. Unsurprisingly, with its seemingly rapid emergence and democratisation, there is a lot of discussion about the benefits and indeed the risks of AI.

There are countless bodies of work internationally that are seeking to build guardrails for AI development and deployment to ensure responsible AI practices. Worldwide, economies are establishing AI policies and roadmaps, while others are pushing ahead with AI regulation. This is all critically important work yet as we are facing an increasingly fragmented ecosystem, we are at risk of
confusing, rather than empowering, business and making emerging technologies too difficult to adopt due to fragmented markets if it is not underpinned by common consensus points.

This is why international standards have a key role to play not only in facilitating the responsible adoption but also in enabling scaling of quality systems. The standards that are highlighted in this report are globally recognised benchmarks that present agile solutions to shape design, deployment and evaluation of AI that promote harmonisation and interoperability across markets. Importantly for AI, they also promote responsibility, trustworthiness, security, and confidence in emerging systems.

This Report sets out that international standards can support stakeholders in the APEC region to overcome the challenges and risks that are limiting scale of AI in the APEC region. International standards provide globally agreed frameworks that promote harmonisation and interoperability in products and services, and across borders. They establish common building blocks for companies and policy makers and set the specifications and requirements upon which new technologies can be responsibly developed, adopted and deployed. We encourage industry and policy makers across APEC to review and consider the findings outlined in this Report. Ultimately, increasing the use of these standards and the engagement from APEC economies in their development will support the use of AI technologies in the APEC region in a safe and appropriate way.

Appendix A: Project outcomes based on survey results

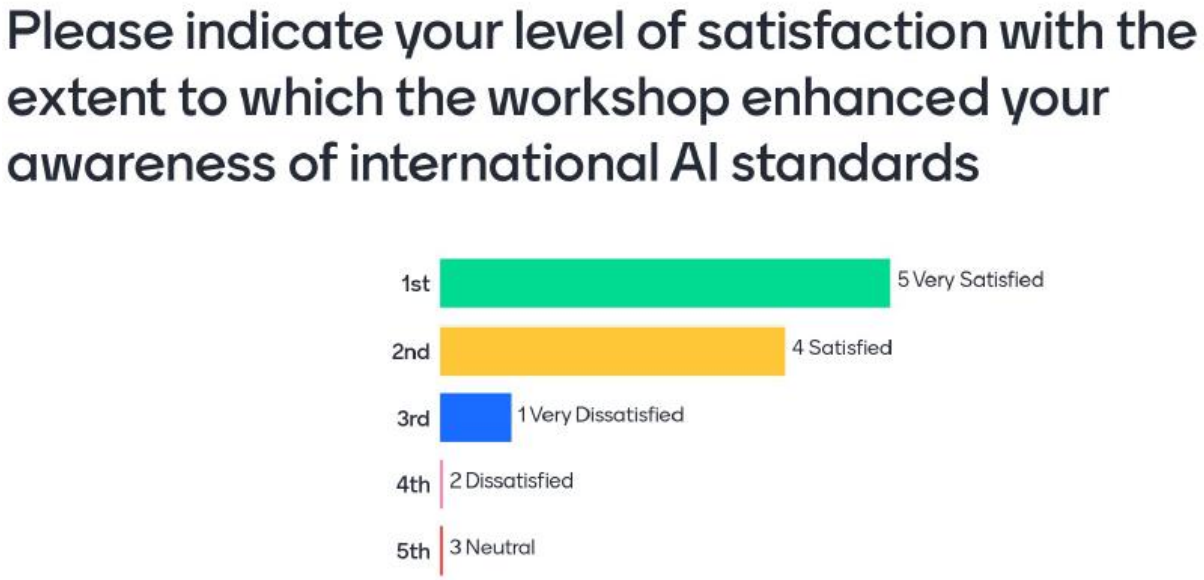
Monitoring and evaluation of the project outcomes was based on feedback gathered through a pre- and post- Workshop survey. These surveys were completed mostly by Workshop participants, who were standards experts, policy makers, regulators and representatives of AI industry. A total of 70 people from 14 APEC economies participated in the pre-Workshop survey and 25 in the post-Workshop survey.

Outcome 1. The quality of the presenters/speakers/facilitators during the workshop

Outcome 2. The usefulness of the topics covered in the workshop

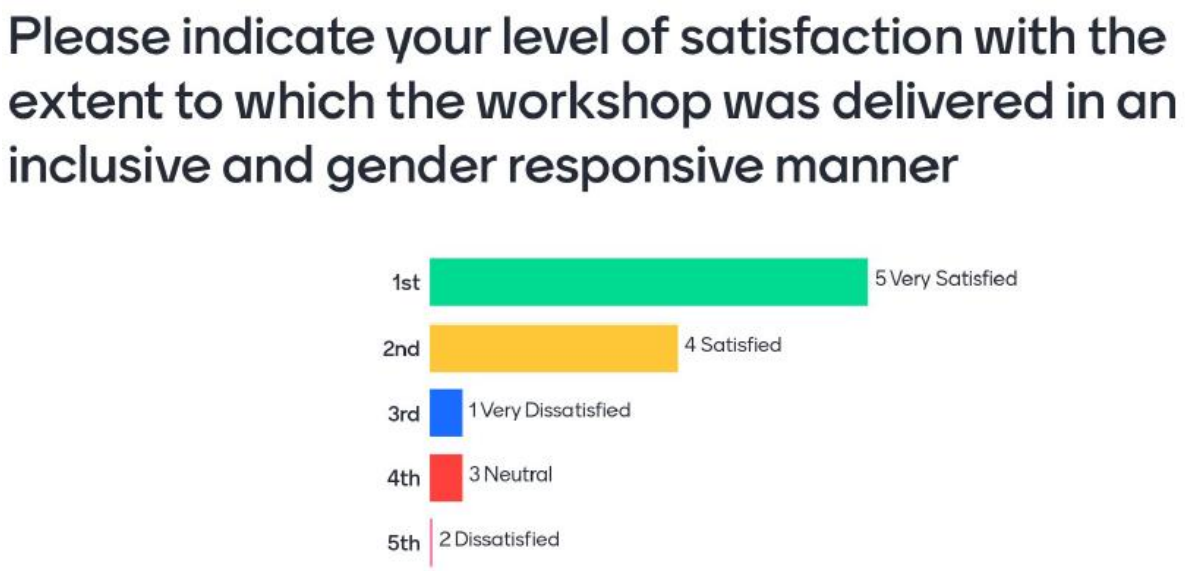
Outcome 3. The extent to which the Workshop enhanced your knowledge of AI

international standards



Outcome 4. The extent to which the Workshop enhanced your knowledge of how to incorporate AI standards in your economy

Outcome 5. The extent to which the Workshop was delivered in a gender responsive manner



Outcome 6. Your overall satisfaction with the Workshop

Outcome 7. What was the most important thing that you learned by participating in this Workshop?

How APEC economies view standards on AI and the different national AI Strategies

It was educational to learn the different levels of understanding and knowledge across APEC in AI and their main concerns.

The different views on AI standards and National AI strategies in APEC economies.

The wide lens of experts and speakers and participation of audience as well as the competence of the facilitators in habdling and managing the workshopI along with the inputs and answers provided

How different economies are using AI or thinking of regulating.

International standards aim to provide a level of guidance and compliance for APEC economies in the adoption and regulation of AI. We need to do more in terms of regulatory coherence and convergence.

There are multiple standardizing bodies setting standards of this area. In addition to that, private sectors also have their efforts in ensuring ethical AI.

Participation with standards allow collaboration with global community for best practises in AI adoption and implementation

Networking

Leaning from the various perspectives of different economies

Challenges from AI, however, this could be solved by the stakeholders Public, private and academics.

Standards on AI and how APEC can promote AI to each member economies. Challenges on the adoption of AI and how can they be addressed.Opportunities for collaboration within APEC like cross Cora events

Standards are imperative in ensuring safety, privacy, among others.Mitigating risks of AI may be covered by standards

We do not have a one size shoe fits all situation.Avenues to be created throught APEC Summit to encourage AI discussions on Standards development guidelines and processes.

The international collaboration as no one has launched the regulation about AI yet.

There are diverging issues and pace in adopting AI across economies. It's very helpful to bring economies together to share learnings and best practices to help develop global standards.

Collaboration, communication, trust and team work in AI advancement and development.

learning the thoughts of AI assisting with standards

How APEC members can collaborate on AI standards development.

Since the workshop is about standard, it provides more insight the importance on standards, in this case for AI. However, it cannot stand alone and a multi-parties cooperation and discussion is needed

It is good to hear ideas and insights from various perspectives

The importance of participation in development and adoption of AI standards

About the AI system's management standard

That int standards can support implementation of AI principals

Outcome 8. What change or action will you seek to make in your economy because of the Workshop?

Introduce the concept of AI to my economy, which is a developing economy

Distribute the information to the other parties

Participate actively & be more engaged.Coherent be more forward looking

Look for opportunities to seek and adopt standards for AI like providing inputs to policies and regulations and collaboration with other government agencies, the private sector and academe

Participate more actively and be more engaged.Be coherent of our policies that are forward looking and outcome focus.

starting up having conversations with related parties

Promote stakeholder engagement and multilateral collaboration.

Seem to encourage participation in my economy

I will share all insights I got from this workshop and see what our economy will do about it.

Increase awareness of AI standards that have already been developed internationally

I will consider assessing the standard to support AI operations in Thailand

To encourage other Ministry's to use AI standards

More water in the room

Support standards

standards.org.au