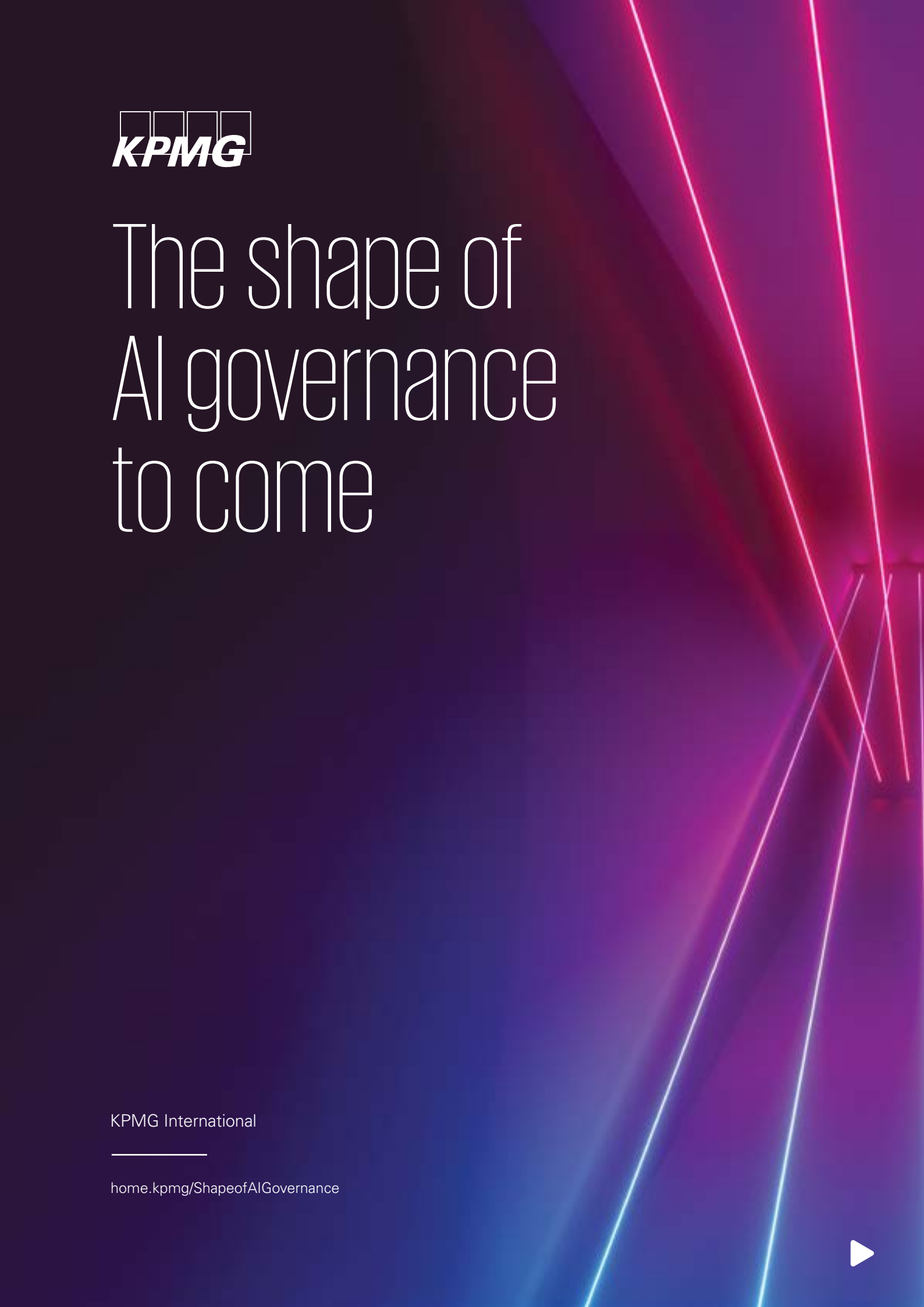

The shape of AI governance to come

KPMG International

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In jurisdictions worldwide, new policy initiatives and regulations concerning the governance of data and AI signal the end of self-regulation and the rise of new oversight. As the regulatory environment continues to evolve at traditional pace, leading organizations are addressing AI ethics and governance proactively rather than waiting for requirements to be enforced upon them.

COVID-19, and the rapid increase in remote working necessitated by the virus, has accelerated the development and use of AI both across organizations and in consumer interactions.

Through the course of 2020 we've seen AI deployed to help organizations better anticipate COVID-19 impact across the globe and industry sectors, so that they can respond to it with greater resiliency. In 2020, we have also seen revitalized focus on the role technology and AI plays across the environmental, social, and governance (ESG) landscape. This includes AI use cases and applications in healthcare, education, law enforcement, and financial services among others.

Relative expansion of AI-driven use cases has highlighted both the benefits and the potential risks of AI — notably the issue of trust in technology. While trust has long been a defining factor in an organization's success or failure, the risk of AI now goes beyond reputation and customer satisfaction' — it is playing a critical role in shaping the well-being and future of individuals and communities around us — even as few fully understand how it works.

KPMG research shows that:

Eighty-seven percent of IT decision makers believe that technologies powered by AI should be subject to regulation.

— Of that group, 32 percent believe that regulation should come from a combination of both government and industry.

— Twenty-five percent believe that regulation should be the responsibility of an independent industry consortium.

Ninety-four percent of IT decision makers feel that firms need to focus more on corporate responsibility and ethics while developing AI solutions.

Source:

Per a study of 300 ITDMs from the UK and the US, conducted by Vanson Bourne on behalf of SnapLogic:

https://www.businesswire.com/news/home/20190326005362/en/AI-Ethics-Deficit-%E2%80%94-94-Leaders-Call

For AI solutions to be transformative, trust is imperative. This trust rests on four main anchors: integrity, explainability, fairness, and resilience. These four principles (enabled through governance) will help organizations drive greater trust, transparency, and accountability.

1. **Integrity** — algorithm integrity and data validity including lineage and appropriateness of how data is used
2. **Explainability** — transparency through understanding the algorithmic decision-making process in simple terms
3. **Fairness** — ensuring AI systems are ethical, free from bias, free from prejudice and that protected attributes are not being used
4. **Resilience** — technical robustness and compliance of your AI and its agility across platforms and resistance against bad actors

A comprehensive AI model framework to enable and operationalize trust, accountability and transparency is often insufficient or lacking within most organizations today. Furthermore, there is limited access to effective guidelines, leading practices, or government regulations. Businesses around the globe find themselves choosing between speed to market with AI-powered solutions and building comprehensive and foundational AI governance capabilities. While being aware of the existential threat that lack of trust in AI poses, organizations find themselves caught in an AI 'space race', whether they are established or new and nimble, companies utilizing AI to scale at speed.

No wonder, then, that many executives are starting to consider how effective AI governance can help them protect and gain competitive advantage, realize operational efficiencies, and, crucially, foster trust among their key stakeholders, including customers. While regulatory frameworks have been developed in recent years to tackle issues related to privacy, the progress towards a more holistic framework that incorporates AI is missing. For their part, governments are hinting that AI technologists and data scientists cannot be solely responsible for effective self-regulation. Governments have been drafting proactive AI regulation to protect the rights of citizens' but also to attract new industries and minimize the flight of intellectual property.

Deploying a governance framework for AI that encompasses technology-enabled methods can help leaders address AI's inherent risks. It can also help them drive a sustainable governance approach. Both business and governments realize that successful and sustainable AI regulation depends on partnership and collaboration to ensure that innovation, business growth and trust in AI can coexist harmoniously.

With that in mind, we have produced this paper as a guide for business leaders who are interested in, or tasked with, creating policies, governance, and oversight of AI technology. It highlights the value of proactive governance and monitoring of their organization's AI capabilities and how building governance into AI development leads to more trusted, impactful, and more widely adopted AI solutions.

The current challenges to successful AI regulation

Across all sectors, business leaders are wrestling with the question of how their organizations should address AI governance and who should be accountable for AI programs and results. They are doing so against a backdrop of rapid AI adoption in business and general society that is highlighting the risks involved and creating some urgency about the immediate need for AI regulation.

Several risk themes have long accompanied AI innovation but have become more pressing in 2020 onwards. They include:

The precision and accuracy of the technology

The rise of computer vision including object detection and facial recognition now allows computers to recognize, analyze and process digital images or videos in order to infer and produce numerical or symbolic information in the form of decisions. These capabilities are being used to screen individuals at the airport, while shopping and for inventory management at retailers without employee intervention, to enhance self-driving vehicle performance and safety and even to help identify medical conditions and changes in patient health.

The potential benefits of computer vision are enormous but not without risk. One challenge is the great diversity of human demographics in terms of gender, age, ethnicity, nationality and income that is often not mirrored in training data sets. Also, the context of the training data images are important when training the AI models. These many variables pose numerous concerns about the technology's ability to accurately read and interpret the visual representations.

The appropriate use of consumer data and data privacy to inform AI

AI systems are contingent on vast amounts of quality data. But how do organizations ensure that only quality and approved data is used to train an AI system? As AI increasingly enters the mainstream consumer experience, a focus on privacy and the responsible use of data will be an important component of new AI regulation. Already, concern about how personal data is used (including consent required to use an individual's data) has led to both global and local regulation (GDPR in the EU and the California Privacy Act in the US) that can act as an initial building block or barrier in the absence of well-established AI governance.

Discrimination and bias in decisioning

Use cases for AI are increasingly based on sensitive personal information, which has raised much public concern about how unfair societal bias, developer bias, and model bias could impact decisions and ultimately lead to discrimination against consumers. For example when training a computer vision model to identify humans in a picture, the training data must not be skewed towards a certain gender or skin color. This will lead to the algorithms learning only a subset and hence inducing bias. As a result, AI models need to be fair. Decisions derived by those models ought to be explainable and traceable, and able to be altered if needed.

That's why proactive businesses and governments are evaluating how to ensure the decisions and results of an AI system are not inadvertently skewed or biased, and how a dataset can be used to train a model that is representative of a desired scenario. They are also looking to determine whether the assumptions and business logic with which a system was built contains inherent societal bias, and when bias should be included in a model as a fair indicator of the outcome. Also use of statistical confidence of the inferences becomes very essential when making business decisions.

For example, some bias that appears skewed towards one group may be appropriate if it can deliver an accurate indicator of the outcome — such as when assessing the likelihood of disease contraction based on gender or ethnicity.

Helping bridge the trust gap through regulation

As a result of the potential risks highlighted above, there currently exists a trust gap in the marketplace between what AI capabilities can do and how users experience them. This gap is exacerbated by two competing narratives in the media — one being that AI will radically and positively change the world, while the other paints a disturbing picture of the damage AI could bring.

In order to bridge the gap between AI's potential and the existential risks it may bring, many stakeholders across the AI landscape are calling for increased regulation or guidance on how to govern the technologies and manage the implications when decisions go wrong or outcomes are unintended. They realize that regulation can provide the broad framework through which organizations can be proactive in how to govern, manage and instill trust in their technologies. Organizations still have a responsibility to provide consumers and business users with an adequate level of transparency and explainability to ensure trust in these powerful technologies.

Governments are also waking up (belatedly, some might say) to the implications of AI technology after years of funding AI development and skill sets without fully understanding or fully considering the potential societal impact and risks.

In the past, both government and business have implemented small pockets of regulation but nothing at the scale or scope to meet the new opportunities and challenges posed by AI.

Some of those previous regulations were implemented at an early stage of technology evolution and were seen to be counter-productive, inhibiting innovation. As technology matures and becomes part of how society functions, regulating it effectively becomes increasingly complicated. Further complications result from the lack of a common language and definitions for enhanced automation capabilities (consider the various interpretations of machine learning and AI that exist in the marketplace) and gaps in AI literacy among various stakeholders.

The upshot is that, after years of accelerated AI development, both business and government find themselves needing to play catch-up on devising standards and regulation that will earn trust, protect the digital rights of individuals and foster responsible growth.

The current state of AI regulation and what happens next

At present, AI regulation around the world is piecemeal at best. Except for a select few countries most geographies have yet to develop a prescriptive set of guidelines or legislated specific AI governance laws for business and society. Many countries, territories or jurisdictions are still in the exploratory stage.

However, global and localized research around AI regulation points to a few trends that indicate the potential shape and direction of AI regulation and how it might evolve. We have identified the following five trends of AI adoption and development that we believe will likely play an important role in shaping the future of AI regulation.

1. Shaping a regulatory future around R&D

Some of the most developed AI markets are putting in place guidelines and regulation that protect and promote domestic R&D, including the creation of innovation incubators to foster the advancement of AI capabilities. By doing so, these nations hope R&D will deliver them a competitive advantage both regionally and globally.

In the US, Executive Order 13859 signed in 2019 established the *American AI Initiative*. The order aims to develop AI capabilities within the US and propel AI inventions in the country's interest. A key objective is to support long-term R&D in AI through increasing access to federal data. The intent is to drive technological breakthroughs by prioritizing AI investment and strengthen the US R&D ecosystem with an emphasis on public–private partnerships to stimulate innovation and maintain the country's leadership in AI technologies.

In Singapore, the central bank, Monetary Authority of Singapore (MAS), worked with financial industry partners to create Veritas, an R&D framework to promote the responsible adoption of AI and associated data analytics. Veritas is considered an integral part of Singapore's AI strategy, which includes significant investments in R&D to advance AI discoveries.

A key goal of Veritas, which has 25 members consisting of large financial institutions and technology partners, is to strengthen and enforce internal governance around the use of AI and the management and use of data.[1]

Potential implications

By focusing on R&D, governments hope to realize long-term benefits through increased overall operational efficiency for both the public and private sectors. They also can create intellectual property that is related to AI — countries will be able to obtain patents, copyright and trademarks for various AI intellectual property. Effective R&D programs also can attract top talent — people will want to work in a country that is leading the way in an emerging field — and can promote creativity and innovation.

However, R&D can be complex, time-consuming and, in the short-term, expensive. One of the risks is that countries will not see the expected return on their investment with AI. Also, there is a need to ensure that AI development remains in line with current policy and regulation. A research team could spend months working on new AI capability only for it to be non-compliant with current regulation.

The same is true for the ever-shifting demands of consumers — something that COVID-19 has made clearly visible. Depending on how long the R&D process takes, there is a possibility that consumer demand may change during the innovation process (i.e. an AI-focused product that was previously needed may no longer be relevant to the current market). Those changing consumer needs or tastes also impact potential regulation. If a nation's AI regulation is too closely tied to R&D ventures, it risks shaping governance that will have little relevance for how AI is being used in consumer society.

2. Create steering groups to discuss and ideate on governance constructs, public policy and ethics

In 2018, the European Commission created a steering group called the High-Level Expert Group on Artificial Intelligence, made up of 52 experts from academic, civil society and industry to produce the EU's Ethics Guidelines for Trustworthy AI.[2]

The Guidelines, released in April 2019 after a year of consultation, identified seven key requirements AI should meet to be deemed trustworthy:

— Human agency and oversight

— Technical robustness and safety

— Privacy and data governance

— Transparency

— Diversity, non-discrimination and fairness

— Societal and environmental well-being

— Accountability

Having agreed on the requirements, the group undertook a piloting process in which all interested stakeholders could participate, in order to gather feedback for its improvement. In addition, the group created a forum to exchange best practices for the implementation of trustworthy AI.

A year later, the Organisation for Economic Co-operation and Development (OECD) launched its Principles on AI to promote innovation that is trustworthy and respects human rights and democratic values. The principles were adopted by 44 countries (37 member countries and seven non-member countries) to facilitate discussion about embedding them into policy and regulation.

Central to the OECD Principles are the following concrete recommendations for public policy and strategy:

— AI should benefit users by driving inclusive growth and sustainable development

[1] https://www.mas.gov.sg/news/media-releases/2019/mas-partners-financial-industry-to-create-framework-for-responsible-use-of-ai

[2] https://ec.europa.eu/futurium/en/ai-alliance-consultation

— AI systems should be designed in a way that respects the rule of law, and they should include appropriate safeguards

— There should be transparency and responsible disclosure around AI systems

— AI systems must function in a robust, secure and safe way

— Organizations and individuals developing, deploying or operating AI systems should be held accountable for proper functioning in line with the Principles.

To accompany the Principles on AI steering group, the OECD launched the AI Policy Observatory, an online discussion and best practice knowledge platform to help "countries enable, nurture and monitor the responsible development of trustworthy artificial intelligence (AI) systems for the benefit of society."[3]

The platform engages governments and a wide spectrum of stakeholders — including partners from the technical community, the private sector, academia, civil society and other international organizations — and provides a hub for dialogue and collaboration. Each participating country has its own dashboard on the platform that allows other users to learn about its published AI strategies and policies.[4]

Potential implications

One of the biggest advantages of setting up a steering group or committee is that it brings together a group of people from various industries, both public and private, who are subject matter experts (SMEs) or have experience in the AI field. Also, the creation of steering committees shows that governments, companies and organizations want to use technology to improve the economic output but also have a desire for AI to be used for social and economic good.

That said, there is always the possibility of 'groupthink' emerging within the committee. When that happens, how do you determine that the conclusion related to ethics is the best decision versus the most accepted one? This might also differ by country and industry. A key component of the committee decision-making process is ensuring that decisions are not compromised.

Another area of concern is the lack of accountability — who is holding the committee accountable and responsible for creating governing constructs and ethics? Who will ensure that the committee is looking out for the public good?

3. Create a forum for discussion and collaboration

This trend builds on the collaborative idea of the steering group but opens it up to key stakeholders, agencies, government and the private sector. In doing so it provides a platform for collaboration based on expert leaders in the AI space.

One good example of this in action is the Pan-Canadian AI Strategy, a US$125 million program launched in 2017 at the behest of the Canadian government by global research organization CIFAR. The national AI strategy was the first of its kind and a key pillar is AI & Society, which aims to develop global thought leadership on the economic, ethical, political and legal implications of advances in AI.

It runs workshops to explore how AI will affect issues like ethical medicine, climate change and inequality among vulnerable populations, as well as bringing future policy leaders together to discuss how AI will impact public policy.[5]

The Pan-Canadian Strategy also created a Solutions Network — a global team of cross-sectoral, interdisciplinary experts brought together to design and develop responsible and beneficial AI solutions. In 2020, one of the key challenges it aimed to solve was how to develop AI governance solutions to support responsible AI in low-middle income countries.

Another collaborative group dedicated to collaboration is The Institute of AI, which is a global non-profit working with legislators from across the world to better understand

[3] https://www.oecd.org/going-digital/ai/about-the-oecd-ai-policy-observatory.pdf
[4] https://oecd.ai/about
[5] https://www.cifar.ca/ai/pan-canadian-artificial-intelligence-strategy

the impact and regulation of AI. Discussions are centered around the ethical, societal, and geopolitical trends in AI development, including AI's role in preventing the spread of COVID-19. The Institute hosts roundtables and briefings with legislators who have an evidenced interest in technology policy and share content throughout their network.

Potential implications

Creating a dialogue for open discussion regarding what is needed to move AI forward in the country allows for a wide range of relevant different and expert perspectives. These can help sense check the current strategy and brainstorm ways for improvement and innovation.

It also allows for discussion and ideas from the public. Representatives from the private sector can offer areas of improvement for AI based on consumer needs and wants. By creating forums and workshops, the government also shows that AI development is a top priority from an economic, social and governance standpoint.

However, while the goal of the forum is to bring together various experts, there is a risk of differing priorities in how AI should be used. For regulators, they will need to choose which AI priorities to value and focus on first.

4. Build the AI ecosystem including skills development, technology capabilities, partnerships, and cross-functional collaboration

To build a sustainable and competitive AI ecosystem of the future, organizations must dedicate funding to R&D, stimulate entrepreneurship, and commit to workforce training. This is especially important for countries seeking to bolster their standing in the eyes of investors, AI suppliers and AI consumers.

In 2017, China published its "Next Generation Artificial Intelligence Development Plan", a road map to becoming the world leader in artificial intelligence by 2030.[6] It includes initiatives for R&D, talent and skills development and industrialization, as well as regulations, ethical norms, and security.

At the heart of this strategy is a three-step plan to create an AI ecosystem for the entire economy and society. The first step was to bring China's AI industry up to speed by 2020 with global competitors by developing a 'new generation' of AI theory and technology. It included a set of standards, policies, and ethics for AI that could be applied throughout the world's second-largest economy.

Step #2 is to become world-leading in some AI fields by 2025, while the final step aims to establish China as the world leader in AI with an industry worth US$150 billion.

To help achieve the first step, China began construction on a US$2.1 billion AI technology park in Beijing that will house 400 companies.[7]

Potential implications

Many nations want to be the world or regional leader in AI as part of the 'next industrial revolution'. To do so will require a truly national effort to provide the resources to train people and build the proper tools. By shaping a vision for an entire AI ecosystem, it's possible to retrain the workforce and focus investment to prepare for the future.

Over the long term, by investing in AI development, training and technology, countries should see an increase in output (i.e. manufacturing and other products), increased efficiency and, hopefully, a return on their investment.

In the short term, however, countries will need to invest in training their people to ensure that the workforce is ready for the AI revolution, which may have societal implications.

[6] https://multimedia.scmp.com/news/china/article/2166148/china-2025-artificial-intelligence/index.html
[7] https://www.cnbc.com/2018/01/03/china-is-building-a-giant-2-point-1-billion-ai-research-park.html

5. Countries and governments are not only establishing AI frameworks, but also creating policies, laws and acts

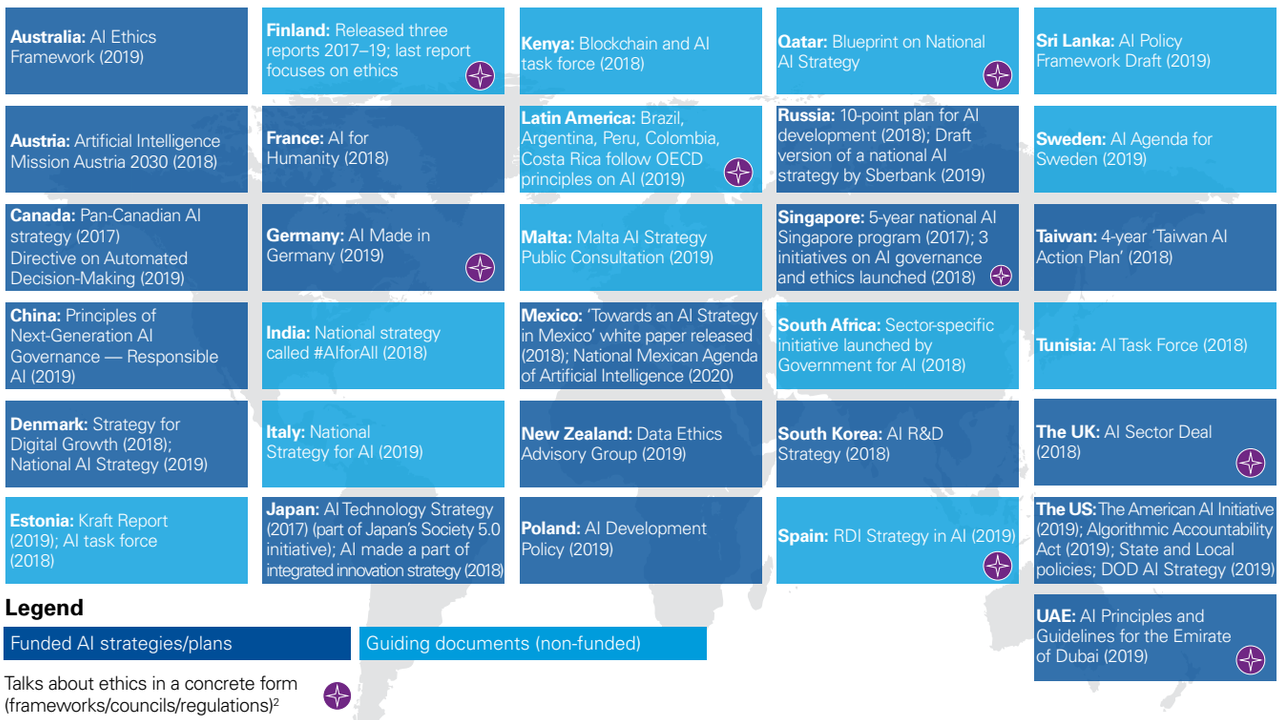
In 2019, US Senators put forward the Algorithmic Accountability Act[8] — the first federal legislative effort to regulate AI systems across industries in the US and a reflection in government of the growing concern regarding the lawful and ethical implementation of AI. The pending legislation would require the Federal Trade Commission to create rules for evaluating 'highly sensitive' automated systems such as AI. It would require companies to assess whether algorithms are biased or discriminatory and whether they put at risk the security or privacy of consumers.

The Act would apply primarily to big technology companies and those that have at least 1 million people or device information, with average annual revenue above US$50 million and primarily act as data brokers that buy and sell consumer data.

The Bipartisan Commercial Facial Recognition Privacy Act was also put forward in 2019. The bill would prohibit commercial companies from using facial recognition technology without people's explicit consent. Users would need to be notified when their facial recognition data is used or collected by the commercial companies. The bill also called for the creation of an independent third party to test new technology to ensure it is unbiased and doesn't harm consumers.

It's not just the federal government that is looking to regulate AI. State and local governments are also pursuing algorithmic accountancy laws. In 2017, New York City became the first US legislature to pass an algorithmic transparency bill while, in 2019, the State of Washington introduced a bill aimed at eliminating bias in automated decision-making.

Global AI regulations in the following countries and jurisdictions



Note:
— Since AI strategies differ substantially on a country-wise basis, broader national AI level strategies launched by the respective governments have been considered — other initiatives as well as minor updates to these strategies may have been overlooked.
— Marked with a star are nations that have a relatively detailed in-depth plan on AI ethical frameworks or regulation (nations with passing references not taken into account).

Source: KGS Analysis, December 2020.

Potential implications

Smaller and emerging nations will be paying keen attention to the actions of countries that are leading in AI (such as the US, the UK and China). This will likely encourage or 'push' them to also create their own AI policies and frameworks.

Given the pace of AI adoption globally, we could well see a rush to regulate over the next 7 to 10 years. Right now, however, there is a 'pacing problem' — technology capabilities are outpacing the existing regulation.

[8] https://www.congress.gov/bill/116th-congress/house-bill/2231

What's the future of AI regulation and how can business play a role?

At present, business is operating and innovating AI in a sort of 'Wild West' environment of regulation. Some countries and regions are actively shaping policies and putting forward legislation while others are creating the frameworks for what best-practice regulation should look like. The majority of jurisdictions globally, however, have yet to fully grasp the full implications of how AI will shape their economies and societies. Furthermore, the pace of AI innovation is happening so quickly that even the most technologically sophisticated governments are struggling to keep up.

The country or region that can help influence standards of ethical global norms of AI and shape regulation to protect it, will likely have an influence. However, some nations will continue to be cautious about the 'overregulation' of AI while trying to understand and mitigate the risks and implications of what can go wrong with AI capabilities.

It is also unlikely that an over-arching set of global AI regulations — a one-size-fits-all approach — can be effective. That's because regulating AI is as much to do with regulating human values as it is technology. We may uphold a set of universal human values, but how they are interpreted and applied across different cultures and countries differs greatly. What is considered bias or discrimination in one nation might well be the law in another.

Getting the right balance between regulation and innovation will be vital for both government and business. That's why transparency and collaboration is so important.

Both government and the business community need to come together in a neutral environment to try to find what's best for everybody and to create something that is adaptable yet enforceable. As we've seen with some of the trends outlined above, that also involves bringing in outside stakeholders such as academics and civic groups. They won't be experts in AI, but they will understand the values that make their society function and thrive.

This type of cross-society and cross-sector collaboration can also create the building blocks for successful future regulation — whether it be principles of AI adoption or formulating a series of industry standards for AI. The more business is involved in the dialogue with society to shape regulation, the more informed all parties will be.

What business can do now

While comprehensive and enforceable, AI regulation may not emerge in the short term; standardized AI governance frameworks, with common AI principles, can be expected to materialize within 2 to 3 years in the relatively AI-mature economies. This means organizations should be proactive and prepared to consider the unique governance and risk implications as they are embarking on their AI journey, and help shape those frameworks and principles.

In absence of clear direction from regulators, organizations can take these six tactical steps to prepare as regulation evolves:

1. **Develop AI principles, policies and design criteria and establish controls in an environment that fosters innovation, flexibility, and trust while identifying the unique risks associated with AI. In addition, understand the footprint of AI within the organization in order to inventory capabilities and use cases.**
2. **Design, implement, and operationalize an end-to-end AI governance and operating model across the entire AI development life cycle, including strategy, building, training, evaluating deploying, operating and monitoring AI. Consider the need to set up separate governance committees and councils to address the unique risks and complexities associated with AI and data.**
3. **Assess the current governance and risk framework and perform a gap analysis to identify opportunities and areas that need to be addressed**
4. **Design a cross-functional governance committee and framework that deliver AI solutions and innovation through guidelines, templates, tooling and accelerators to quickly yet responsibly deliver AI solutions.**
5. **Integrate a risk management framework to identify and prioritize business-critical algorithms and incorporate an agile risk mitigation strategy to address cybersecurity, integrity, fairness, and resiliency considerations during design and operation**
6. **Design and set up criteria to maintain continuous control over algorithms without stifling innovation and flexibility. Consider the need to invest in new capabilities to enable effective governance and risk management enabled through tooling for AI.**

Conclusion

Anyone working in the field of AI already knows just how transformative it will be for business and society in the coming years. Today, companies have the opportunity to push forward AI innovations that will shape our world at a pace and on a scale unseen since the invention of electricity.

With this power comes great responsibility. At present, many governments are engaging and collaborating to better understand the impact AI may have. As the regulators continue down that path, the regulations they draft may seek to influence the cycle of innovation and application of AI across a wide range of industries and use cases.

The companies that are proactively formulating and operationalizing their own AI governance policies and principles now — ones that build trust and demonstrate transparency and high ethical standards — can help governments shape regional and global regulation and be better positioned to succeed when regulation is enacted.

By acting now, business can help frame AI regulation that can benefit all of society.

How KPMG can help

KPMG's AI In Control helps organizations address key inherent risks and misperceptions associated with AI and Machine Learning. This, in turn, can help foster transparency and confidence in AI and serve as a foundation for innovation and new use cases.

AI in Control incorporates our AI/ML experience, tools, and methodologies as well as multidisciplinary capabilities around governance and risk management into one solution designed to complement your AI program and strategy.

Learn more at:

home.kpmg/ShapeofAIGovernance

https://home.kpmg/xx/en/home/insights/2018/07/our-artificial-intelligence-capabilities.html

https://advisory.kpmg.us/content/dam/advisory/en/pdfs/kpmg-controlling-ai.pdf

https://home.kpmg/xx/en/home/insights/2018/12/kpmg-artificial-intelligence-in-control.html

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Designed by Evalueserve.
Publication name: The shape of AI governance to come
Publication number: 137220-G
Publication date: January 2021