FOREWORD

We are excited by the potential of artificial intelligence (AI) to deliver tremendous benefits for our society across all industries and ultimately drive a better quality of life for every Australian. We believe advances in these areas will see job creation and breakthroughs that lead to new solutions for some of the largest and most intractable problems we face.

As with any new technological revolution, there are significant challenges emerging, that need to be addressed in order to safeguard national values and rights for all. As the pace of the development of smart technology outpaces regulation, it’s up to the trailblazers to illuminate the risks we need to pre-empt.

Earlier, this year, KPMG hosted the Future AI Forum at our offices in Sydney, to showcase the power of AI and also stimulate debate around ethics, principles, standards and regulation. The event was attended by over 120 leaders from across corporates, education, government and not-for-profits and revealed that there is strong need and support for evidence-based policy and regulation to address the specific challenges AI presents.

This report expands on this base by delving into the complexities of the landscape with respect to ethics, principles, standards and regulation. It explores the diverse perspectives of experts from across the AI ecosystem in Australia and the need for different types of governance and frameworks to drive transparency and accountability in the development and use of AI, while protecting the personal freedoms of the whole community.

KPMG is proud to have partnered with C-Suite Exchange in the facilitation of this important dialogue. We look forward to continuing to actively participate and collaborate with industry leaders and policy makers to stimulate ethical investment in AI for the benefit of our society into the future.

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Artificial Intelligence: Perspectives on Fate in AI
Fairness, Accountability, Transparency and Ethics for a more equitable future

An insight into the opportunities and challenges posed by artificial intelligence for industry – and why governance and frameworks around transparency, ethics, and fairness cannot be ignored.

As the artificial intelligence revolution gathers pace, it is raising important ethical and governance questions surrounding its responsible use. This was among the key issues addressed at the C-Suite Exchange Women Ambassadors Luncheon in collaboration with KPMG, DiUS, Western Sydney University and pymetrics.

The event held in Sydney on April 5 brought together a distinguished group of experts in the field of AI not only to discuss its many applications permeating every aspect of our lives, but also debate the governance, ethics, and transparency challenges in helping to shape the future of this emerging technology.

Overview

Despite being in the early stages of development, AI now powers many real-world applications from bots in contact centres, driverless cars, facial recognition (biometrics), driver fatigue management systems to weather prediction and cancer detection systems. Just looking at how Google is making Gmail an all-encompassing AI platform alone is incredible.

The fact that Gmail can now intelligently work out what you’re trying to write and complete an entire e-mail for you is impressive. Given the relentless pace of AI innovation, imagine what Gmail can do in the next two years.

The growing adoption of voice-activated AI devices such as Alexa and Echo in households across the US and globally is another significant trend. The number of Amazon Alexa skills in the US more than doubled in 2018 while the number of skills surged by 233% and 152% in Alexa’s two other top markets, the United Kingdom and Germany, respectively.

Advancements in AI hold great promise for industry and society as data-enabled technologies help to predict and provide intelligence to boost industrial efficiencies and improve the wellbeing of society. For instance, the coming together of IoT (Internet of Things) and AI in the automotive industry is helping to prevent road accidents, ultimately promoting safer driving.

AI is also making significant inroads in the healthcare sector with various applications assisting medical professionals in their decision making.

FotoFinder Systems, for example, has developed an AI application called the Moleanalyzer pro that allows physicians to confirm their skin cancer diagnosis using evaluation techniques combining specialist expertise with AI, including the option of getting a second opinion from skin cancer experts around the globe. Skin cancers account for about 80% of all newly diagnosed cancers each year in Australia according to the Cancer Council Australia.
The Australian Government identified 14,320 new cases of melanoma skin cancer diagnosed in 2018, accounting for 10.4% of all new cancer cases diagnosed. AI-driven development could be useful in improving skin cancer diagnostics.

The vast amounts of data sets collected and analysed by AI to predict patterns and outcomes are raising issues around privacy, security, ethics, and transparency to ensure individuals and organisations are comfortable about the way data is used. Based on discussions and conversations at the C-Suite Exchange event, here are my three key takeaways from the event:

**No real regulation governing AI**

According to the IEEE global initiative on the ethics of autonomous and intelligent systems, the industry requires policies or standards in the following areas:

1. **Legal accountability:** Whether property laws or legal responsibility cover the potential harm caused by AI systems.
2. **Transparency:** To reinforce the data usage policy and reasonable access to the rules embedded in these systems along with audit trails.
3. **Policies:** To ensure strategies measuring the impact and implications of these systems are in place.
4. **Embedding values into AI applications:** To express norms in terms of obligations and prohibitions computationally.
5. **Governance frameworks:** To ensure standards, processes, and procedures do not infringe upon basic human rights.

Dr Catriona Wallace CEO and Founder of Flamingo AI, pointed out the lack of existing industry regulation, law or ethics frameworks with no one really checking algorithms; bad AI predicting, according to her, can lead to poor and biased results.

She also highlighted the little knowledge CEOs and Boards have about AI; the only teams playing an important role in AI development are the developers and innovation teams within organisations. Successful application of AI in many different areas of the organisation requires serious involvement of senior management in understanding how the technology can fundamentally impact their organisation and the services they offer customers.

Wallace stressed the need for frameworks in place from Day One, stating that while data privacy frameworks currently exist, there is nothing on AI both globally or in Australia.

Grace Kerrison, Managing Director of pymetrics, which uses neuroscience data and AI to help clients make their hiring and internal mobility more predictive and
less biased, believes that regulation, or at least clearer ethical frameworks, is just around the corner given the rapid advancements in the field.

She said that while many HR tech vendors in the market talk about AI and have AI-based platforms, few understand the implications around AI and the need for transparency, fairness and accountability.

When embarking on an AI project, she advised organisations to not work with a vendor just for the sake of technology alone. Pertinent questions around the integrity of your data set, for example what it is trying to solve and how the data will be used should be addressed in detail before going live.

For instance, if you are trying to solve the problem of attrition or diversity, make sure the sample sets address these concerns. Kerrison also advised users to check on the potential adverse impacts of the outcome before the data goes live to ensure that there is no unintended bias built into the data.

The need for AI regulation poses a dichotomy of views among its proponents according to Wallace.

She stated that data scientists and machine learning specialists typically do not want regulation of algorithms as these could create a certain level of “sameness” and potentially interfere with the value of AI. However, she did agree that from the data scientist’s perspective, the domain should be regulated, not the algorithms.

Beth Carey, CEO and Co-Founder of machine intelligence startup, Pat Inc, a company that represents human language for computers, weighed in on the regulatory direction pointing to the growing number of organisations providing AI certifications.

The Federation of Responsible Robots in Europe is one such company offering this service. Pat Inc. is currently working with US-based Virtue Consultancy to check and certify if algorithms and processes used in developing AI are accountable, non-biased, and transparent.

Carey anticipated many such organisations offering these certifications to emerge in the next few years.

Liesl Yearsley, Co-Founder and Chief Executive of A.kin, a Silicon Valley and Sydney-based company conducting intensive R&D into the application of neuroscience in AI platforms, cautioned that too much talk about regulating and policing AI could weigh down organisations in keeping up with technology.

She described AI as the single-most pervasive technology she has ever worked on, stating that when you start policing a rapidly progressing technology like AI, there is a chance other countries might overtake Australia.

Regulation, she opined, will not be able to keep up. Yearsley suggested measuring time-driven outcomes instead; for instance, how AI is impacting our
health, our daily routines, the wellness of families or improving organisational efficiencies in say, the next three years.

Kate Marshall, Partner at KPMG Law raised that although there isn’t currently any overarching legislation governing the AI industry there are laws that already apply. Examples include privacy and anti-discrimination laws.

There is also regulatory reform being considered to address autonomous vehicles and the new consumer data rights will help give individuals more control and access over their data. The question is whether that ad hoc approach is enough.

A 2019 AI study by Ecosystm with input from 1,234 decision makers across the globe concurs with the views of the panellists. Findings from the Ecosystm research show that compliance and regulation are the biggest concerns for IT decision makers and CIOs when embarking on AI implementation (Figure 1).

Figure 1: Top Challenges in Procurement and Implementation of AI

Over 50% of IT decision makers highlighted regulation as a challenge they are frequently queried about and its importance in ensuring the successful outcome of projects to benefit clients and consumers.

As organisations embark on adding AI capabilities to their products and services or enabling bots or conversational bots for customer experience, concerns are being raised around compliance especially since AI involves analysis of massive data sets.

Could AI become the next frontier in cyber warfare?

The more prevalent a technology becomes, the more it can open doors to new opportunities or be used for sinister purposes. From CIOs to CISOs, AI presents two prominent risks that could change the very nature of their jobs. First, criminals, bad state actors, unscrupulous competitors, and insider threats could...
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manipulate their companies’ fledgling AI programs. Second, attackers could use AI in a variety of ways to exploit vulnerabilities in their victims’ defences.

Dr Yun Bai, Director for Computer Science Programs at the Western Sydney University, added that hackers could become extremely dangerous when equipped with AI tools using it to launch stealthy, large-scale attacks targeting the organisation.

In order to build ethics and regulatory frameworks to address security and privacy concerns, Yun suggested having an open dialogue with graduates involved in writing the code as the crucial first step.

Increasing the accountability and transparency among the people building the systems is essential, with advice on what they can and cannot build. Yun emphasised that humans and machines must work hand in hand to avoid creating a “cyber war” within the organisation.

The industry needs to seriously grapple with this mounting problem in terms of identifying the vulnerabilities of AI systems within organisations before hackers can infiltrate these gaps causing massive data leaks, manipulation, and exposure of sensitive corporate secrets.

A recent Ecosystem study on cybersecurity in 2019 which surveyed 1,307 CIOs and CISOs found that close to 70% of respondents in Australia emphasised that AI projects will drive a greater need for security (Figure 2).

Figure 2: What is driving the continued focus on security?

[Bar chart showing factors driving security focus]

Source: Ecosystem Cybersecurity Study, 2019
N=1,307
Alexa, Siri, Cortana: Addressing gender bias

Machine learning is inadvertently amplifying certain deeply ingrained gender and social stereotypes. Panellists at the luncheon pointed out the tendency for most bots in the marketplace to have a female name or voice with familiar ones being Alexa, Rosie, Cortana, Siri, and Amy, among others.

Wallace revealed that nearly 75% of bots have female names, quoting various studies that found female names as having the lowest friction point between a human and a robot. If humans think a machine is somewhat human and has a female name, there tends to be lower friction for the individual when speaking to the machine. This is because women are perceived to be better listeners, show more empathy, and are able to better explore issues a customer is facing before getting to the root of the problem. Empathy and concern are viewed as two essential attributes for communication between the human and machine; hence, the trend in feminising bots and machines.

Yearsley agreed, relating to a project A.kin was working on with an insurance company, where they named the avatar Samantha or Sam for short. She added that people feel more comfortable talking to a woman for their ability to have empathetic dialogue.

With the growing role of AI in our lives, homes, and communities, AI developers are considering gender qualities when choosing the name of an avatar or device to create a certain level of comfort for humans when interacting with machines.

However, this trend could lead to gender biases and prejudices. Joy Buolamwini, an MIT scientist and Founder of the Algorithmic Justice League, published a study that uncovered large gender and racial bias in the AI systems of tech giants like IBM, Microsoft, and Amazon.

Given the task of guessing the gender of a face, all companies performed substantially better on male faces than female ones. The error rates were no more than 1% for lighter-skinned men while for darker-skinned women, the error rates soared to 35%. When asked to classify the faces of Oprah Winfrey, Michelle Obama, and Serena Williams, the systems failed.

Wallace, in an interview early this year with the Australian Financial Review, said that one of her favourite tricks at conferences is to ask audiences to take out their smartphones and Google “unprofessional hairstyle”. Almost every image that follows that search is of African-American women.

The example, she explained, illustrates how much discrimination is being hard-coded into society. Mobile phone manufacturers have also been similarly criticised for having facial recognition software that recognises women with lighter skin tones.

Machine-learning bias is a significant challenge ahead for the industry where constructed algorithms are unwittingly picking up the many racial and gender stereotypes we are striving to resolve and applying that to all scenarios of
applications as they are built. Issues around biases cannot be taken lightly as they could ultimately lead to bad decisions and adversely impact accuracy.

Rethinking the future of AI

It is undeniable that AI will continue to transform every facet of our work, play, and home lives, and benefit organisations in terms of making better decisions and predicting outcomes. The disruptive potential of AI also poses looming risks around fairness, ethics, transparency, and security prompting calls for greater governance to avoid negative repercussions.

Several panellists at the C-Suite Exchange event did anticipate the emergence of more regulatory frameworks in place with a growing number of countries announcing their intention to introduce governance frameworks. However, issues around what is regulated will be important.

For instance, should we look at controlling the domain, and not the algorithm? There is also the delicate balance between regulation and overregulation to contend with. While regulators in Australia could develop frameworks dictating fairness and ethics in AI, this could potentially inhibit technological innovation causing the country to fall behind other nations in this critical emerging domain.

A more viable path for organisations embarking on building AI capabilities perhaps would be to consider working with organisations that look at verifying AI outcomes and development before deployment.

These certifications work to assess outcomes and how the data will be used while identifying potential adverse impacts of the AI platform, including intrusion of privacy, biases, and unethical dissemination of data.

Developing AI systems that continually audit and self-govern biases and prejudices could minimise the risk of bad predictions and lack of trust in AI’s decision-making capabilities. This requires working with the right vendors and data scientists that can build different scenarios of how the data will be shared and used by external organisations before the project goes live.

At DiUS there is more diversity in roles in project teams – today it’s not all about data scientists - teams are 90% developers and 10% human-centred designers.

Sol Pandiella-McLeod, Principal Consultant - Human Centred Design at DiUS, says that artificial intelligence developers still have a heavy technical focus on solving a problem, with little thought to what it is that people really need solved and little focus on the implications and impact on society.

To change this tech-heavy system in AI-related projects, Sol says there is a need to combine the social scientists and user research (UX) designers to integrate data that the tech team has not considered – user journeys and user flows.
The cybersecurity industry also needs to play a pivotal role here to mitigate the serious implications around the use and possible misuse of AI.

While we ponder these issues, we should also recognise the immense possibilities of AI to transform and augment human potential. Attempting to legislate fast-moving fields such as AI, however, could prove challenging and potentially stifle its enormous benefits in improving the quality of life.

That said, building ethical and transparent frameworks is a must and cannot be ignored.

For real progress to happen, the government, as well as industry and academia in AI, need to ensure there are enough checks and balances in place in AI development and deployment to safeguard individuals from bias, unfairness, and threats to their safety. Innovation guided by responsible and ethical use is the smart way forward in harnessing the extraordinary potential of AI.