SUBMISSION

Submission to the South Australian House of Assembly Select Committee on Artificial Intelligence

Submission to the inquiry into artificial intelligence

18 August 2023

The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

South Australia's defence, space and food and wine industries provide a unique opportunity to engage with AI development, and previous investments in the Australian Institute of Machine Learning and Lot Fourteen have positioned the state well to take up these opportunities. Australians are supportive of the potential of AI, with 69% believing that AI will have a net positive impact on the nation (Selwyn et al., 2020). However, unlike many traditional industries, AI development requires comparatively lower upfront capital and is less constrained by geographical factors (e.g. the location of resources), allowing the sector to quickly move and adapt to ever changing market conditions. The South Australian Government must ensure that a strong AI ecosystem and talent pool is available to ensure South Australia can retain a competitive and innovative edge.

AI systems, like all new technologies, also present challenges. A lack of user familiarity with AI systems and AI's overconfidence in its answers risks users relying too heavily on AI decision making, without appropriate checks and oversight. Biases in training data and violations of intellectual property rights are emerging issues that must be managed. In some instances, AI raises issues around privacy and civil liberties that must be acknowledged and potentially regulated. In a responsible democracy, users should be aware of these risks and understand how to use AI ethically to ensure they mitigated. AI should only be used to provide and support government services when its use meets community expectations and has demonstrable value.

ATSE has previously worked with the Australian Government through the National Science and Technology Council on a rapid report on generative AI and has provided submissions to the Australian Government on generative AI in the Australian education system, safe and responsible AI use and the National Robotics Strategy. ATSE makes the following recommendations for the South Australian Government's approach to AI:

Recommendation 1: Invest in AI research and development for critical South Australian industries, including defence, space, and food and wine.

Recommendation 2: Provide professional development opportunities, supported by professional development leave, to teach existing educators how to engage with AI both inside and outside the classroom.

Recommendation 3: Support investment in cost-effective and clinically meaningful AI and robotics for state managed hospitals and health care providers

Recommendation 4: Develop and provide ethics and AI use training for all members of the South Australian public service who interact with AI systems that support decision making.

Recommendation 5: Require regular reporting and monitoring of AI-supported decisions made by government.

Investing in AI powered industries

AI provides opportunities across South Australian industry. South Australia's nation-leading defence and food and wine sectors can be enhanced through deploying AI systems. South Australian innovations and companies are already showing a global impact – like Fivecast, which emerged from the Data-to-Decisions CRC and is now a multinational company providing AI driven insights into policing and national security. AI systems already exist that can support South Australian industry including systems that help vineyards monitor the health of their vines. The Defence Force is also investing heavily into AI, with the Australian Defence Force's equipment acquisition plan identifies six AI-relevant projects, worth more than $10 billion this decade (Layton, 2022). Each industry will have unique needs – for example, defence will require maximum levels of cybersecurity and failsafe procedures – meaning that bespoke industry-specific AI applications will need to be developed.

To lead these emerging AI-enabled sectors, South Australian industry needs to not only embrace AI, but be at the forefront of its development. Targeted investment is needed across the research and development pipeline to support this transition to AI-enabled industry. This will support South Australian AI experts to develop the next generation AI systems and then bring them to market. By focusing investment in areas crucial to the South Australian economy, the state can benefit through both the development and application of AI systems. Support for AI-enabled sector will need to have a long-term focus. The relatively low level of required capital investment in AI technologies means that the industry will be highly responsive to changing

market conditions and incentives and will move to make the most of new opportunities. A long-term investment plan will help to incentivise AI developers to set up, and remain, in South Australia.

Recommendation 1: Invest in AI research and development for critical South Australian industries, including defence, space, and food and wine.

Training the next generation to use artificial intelligence

This investment will need to be supported by the development of an AI-ready workforce. This workforce will need to include both people who are trained to use AI systems, and those who can develop the next generation of AI systems to meet changing needs and adapt to evolving technologies. ATSE applauds the South Australian Government for standing alone as the only Australian state to allow the use of generative AI in public schools (Jaeger, 2023), a stance ATSE has previously recommended the other states adopt. AI is emerging as the next big technological leap forward, changing the way we live and work on a level on par with that of the internet. It is essential that students are comfortable using AI systems, to fully participate in the workforce of tomorrow and enable productivity gains for the South Australian economy into the future. Crucially, the curriculum needs to be flexible to account for rapid change in AI technology and ensure students develop the skills needed to become AI innovators. This will empower Australian students to become the next generation of AI leaders, developing and embracing future generations of AI technologies.

Current content on programming and coding within the Australian Curriculum needs to be supplemented with specific AI education. To ensure that these educational opportunities can be seized, educators and administrators should be supported to feel confident in employing this technology in their classrooms. Professional development opportunities need to be created and encouraged, with appropriate time off to encourage and support educators to engage with this new technology and implement it to enhance their learning and teaching activities. For the near future, ongoing professional development will be required each year to ensure educators are able to adapt their teaching practice to the changing technology as it matures. Teachers can also work with programs like Grok Academy, which is already working to integrate digital and AI skills into classrooms and provides free support for Australian teachers with teaching digital technologies.

Recommendation 2: Provide professional development opportunities, supported by professional development leave, to teach existing educators how to engage with AI both inside and outside the classroom.

Using AI to reduce health disparities

AI has a major role to play in the future of healthcare. Robotics surgery and AI-assisted diagnosis have already demonstrated superior outcomes compared to traditional medical practices (He et al., 2019; Hussain et al., 2014). By late 2021, there were already around 350 AI medical devices approved for use by the US Food and Drug Administration – a number likely to only continue to grow (Badal et al., 2023). It is essential that these tools are used to alleviate health disparities and reduce over diagnosis/treatment.

A funding deficit exists for these kinds of technology-assisted medical practices. Robotic surgeries have been found to have a funding deficit of around $4000 per case in Australia (McBride et al., 2021), which may result in procedures being limited to private healthcare providers. The South Australian Government must ensure that that all patients have access to these technologies when they need them. Investment is needed to adopt these emerging systems within the public healthcare network and ensure appropriate training for healthcare workers. Funding must cover the true cost of procedures to ensure that other services are not impacted, or public patients are not left covering the difference. Training medical professionals to use these tools effectively will take time and require strategic deployment of these resources where they can have the most positive impact. This should be balanced against other needs of the sector and focused on the most cost-effective and clinically meaningful systems to ensure the South Australian public gets the greatest possible benefit.

Recommendation 3: Support investment in cost-effective and clinically meaningful AI and robotics for state managed hospitals and health care providers.

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Ensuring ethical use of artificial intelligence in decision making

In addition to improving the efficiency and quality of decision making, AI tools present an opportunity to help break down a range of social inequalities and reduce bias by reducing the impact of human-centred unconscious bias, but only with the right safeguards in place (OECD AI Policy Observatory, 2022). Inequalities produced by AI systems are easier to identify and correct than biases in human decision making (Kleinberg et al., 2019). However, the impacts of AI are not always evenly felt, and AI systems have the potential to unintentionally reinforce and amplify existing societal disadvantage without proper safeguards. There is already evidence of racial bias in AI recruiting software (Zapata, 2021) and gender bias in facial recognition systems (O'Connor & Liu, 2023). Beyond overt bias, models trained on aggregated data may result in homogenised outputs that fail to consider biological, cultural or religious differences – a particular concern where this works to erase cultural identities of already marginalised groups. For example, AI healthcare models that lack sufficient data on Aboriginal and Torres Strait Islander populations may misdiagnose these patients or suggest inappropriate care options. The South Australian Government must ensure that AI systems used in decision making are subject to human oversight by those trained in the ethical use of AI systems. This will include public servants, as well as teachers, doctors and other service providers. A single set of AI use standards across the SA public service should be developed, and all staff interacting with AI systems that support decision making or content creation should receive appropriate training in the ethical use of AI. AI use standards should also require transparency. Members of the public should be made aware where decisions are AI assisted and have a right to access information about how an AI-assisted decision was made, where that decision affects them.

Feedback on individual decisions is essential to build trust in the use of AI systems but may not fully highlight systemic bias in an AI system. While individualised reports can be valuable, users must trust that they are an accurate reflection of a process that occurs in a 'black box' that makes it impossible to verify the rationale behind outputs. Individual reports may also disguise systemic effects, particularly where these reports are generated by the AI system itself. It is therefore necessary that all government uses of AI are subject to requirements to continually report aggregated outcomes. Producing usage-wide reports will help identify systemic issues and support individuals who wish to contest decisions where systemic bias has affected decisions. Crucially, this data should form the first step of a clear and transparent process to challenge AI-supported decisions, particularly where they affect government service delivery or are linked to human rights protections. This should be supported by public outreach to ensure people are aware of their rights and remedies.

The growing likelihood of AI-assisted decision making as part of government services also raises concerns around data privacy. These concerns include privacy of the underlying data upon which AI applications are trained, but also concerns around the use of information entered into these systems during the course of their usage, particularly for AI systems that could help the public service make important decisions that utilise sensitive information (e.g. medical records). Data privacy regulation is likely to be addressed by the ongoing consultation on safe and responsible AI being conducted by the Australian Department of Industry, Science and Resources,

Recommendation 4: Develop and provide ethics and AI use training for all members of the South Australian public service who interact with AI systems that support decision making.

Recommendation 5: Require regular reporting and monitoring of AI-supported decisions made by government.

ATSE thanks the House of Assembly Select Committee on Artificial Intelligence for the opportunity to respond to the inquiry into AI in South Australia. For further information, please contact academypolicyteam@atse.org.au.

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