

Horizon Scanning Series

The Effective and Ethical Development of Artificial Intelligence: An Opportunity to Improve Our Wellbeing

SMEs and Start-ups

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Title: AI and SMEs and startups

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Abstract: A report commissioned by Google estimates that until 2030 Australia could increase its national income by \$2 trillion from productivity gains afforded by increasing automation and AI.¹ How can SMEs and startups be part of this? How can we help them benefit from the continuous progress in AI? In this paper we examine these and related questions.

1. How can AI increase the productivity of SMEs and startups?

Data and computers are critical resources to enable AI. Yet, these resources are unevenly distributed. At first this would perhaps suggest that large corporations are inexorably destined to be ahead when it comes to leveraging AI to grow their business. Not so. Young businesses have their own upsides. First, they are not burdened by a labyrinth of legacy IT systems or complex political landscapes and can adapt faster to technological changes. Second, AI can automate certain human tasks that are too costly for small companies to maintain. This frees up time, money and human resources and makes it possible for such businesses to more effectively compete with larger well-established organisations. Finally, key AI powerhouses such as Google and Amazon have been actively open sourcing many of their tools and APIs, effectively democratising their AI technology for the entire world to use.

Here we look into a few ways in which AI can improve the productivity of small businesses.

1.1. Machine Learning APIs

A Japanese cucumber farmer has been using a Google machine learning API to automate the sorting of cucumbers based on size, color, shape and texture.² His son is an embedded systems designer and helped with the project. Sorting cucumbers into several categories is required as market prices vary significantly depending on certain attributes of the cucumber. The sorting was previously done by hand and was the full-time job of the farmer's wife. The farmer and his wife are now pleased that she can focus her energy and time on more creative and less repetitive tasks.

Tech giants like Google, Amazon and Microsoft, as well as many other smaller actors, have developed APIs supporting the incorporation of AI functionalities such as natural language and text processing,^{3,4,5} speech processing,^{6,7} and image

¹ <http://www.alphabeta.com/wp-content/uploads/2017/08/The-Automation-Advantage.pdf>

² <https://cloud.google.com/blog/big-data/2016/08/how-a-japanese-cucumber-farmer-is-using-deep-learning-and-tensorflow>

³ <https://aws.amazon.com/comprehend/>

⁴ <https://www.textrazor.com/>

⁵ <https://cloud.google.com/natural-language/>

⁶ <https://cloud.google.com/speech-to-text/>

⁷ <https://aws.amazon.com/transcribe/>

processing and computer vision^{8,9,10}. Some of these, such as tensor flow, are open source, while others have pricing models that make them attractive for small businesses and startups. These tools are creating nothing short of a revolution in the proliferation of AI services. Any company can now create novel AI applications with the support of even a single software designer.

1.2. Off-the-shelf AIs

Not every use of AI requires a software expert. There are numerous off-the-shelf AI products that can add significant value to any business, and to SMEs and startups in particular.

For instance, SMEs usually do not possess a significant HR function, and as a result can greatly benefit from HR automation tools. Tangowork provides chatbots with HR functionalities, allowing employees to use natural language to ask questions or make requests about HR related matters, such as “I’d like to apply for leave from tomorrow until next Friday”.¹¹ Over time the chatbot learns the patterns of interaction of each employee and effectively becomes a personal assistant, anticipating requests and providing notifications accordingly.

AI can also be used to coach salespeople to refine their conversational skills during a call so as to maximise sales performance. For instance, solutions such as Gong record and transcribe calls, then correlate sales success with features of the call, such as choices of expressions, ratio of time talking vs listening, call duration, etc.¹² The analysis reveals ways in which a conversation can be shaped so as to increase the odds of closing a deal.

Some AI tools fit perfectly the need for finding product-market fit, a major challenge for a startup. Natural language processing can be used to create sentiment analysis tools such as Keatext, compressing and interpreting vast amounts of textual data.¹³ This allows startups to screen different market niches for similarities with potential product offerings.

Numerous other applications, from website optimisation via personalised A/B testing to the optimisation of hiring decisions can in principle be harnessed to increase the productivity of small businesses.

2. How can we help Australian SMEs and Startups to capitalise on AI over the next 10 years?

The innovation ecosystem is constructed of many elements, that are interwoven and mutually supporting. At the centre of the ecosystem are the entrepreneurs who

⁸ <https://cloud.google.com/vision/>

⁹ <https://aws.amazon.com/rekognition/>

¹⁰ <https://azure.microsoft.com/en-us/services/cognitive-services/computer-vision/?v=18.05>

¹¹ <https://tangowork.com/>

¹² <https://gong.io/>

¹³ <https://www.keatext.ai/>

create the SMEs and startups, with the other elements supporting and encouraging them on the path to building successful businesses.

Government is one of the key elements of the eco-system that is able to provide coordinated support mechanisms across a breadth of initiatives. The best approach is to nudge progress broadly, rather than invest in a few large programs in limited areas.

Leading nations are investing heavily to support AI in general and the AI business ecosystem in particular. The UK Government worked together with over 50 tech companies to develop an AI Sector Deal worth over £1 billion, articulated in a policy paper released in April 2018.¹⁴ The French Government in turn announced an investment of €1.5 billion in AI until 2022.¹⁵ In comparison, Australia's last federal budget allocated \$30 million to AI, a modest amount by comparison even when accounting for the differences in GDP and investment time horizons. Australia needs to invest significantly more in AI.

To achieve this we need to work simultaneously on three fronts:

- Financial incentives for AI development;
- Grow the AI talent pool; and
- Connect entrepreneurs to AI talent.

2.1. Financial incentives for AI development

There are several mechanisms we can use to support financial development of new technologies inclusive of AI-related businesses. Some options include:

- Relax restrictions and increase tax incentives for AI-related venture capital investment
- Introduce a class of investor visa specific to AI-experienced entrepreneurs and experienced startup mentors
- Work with the private sector to make it safer for financial institutions to provide credit for AI-related investments
- Support overseas investment in Australian venture capital
- Development of AI-specific startup grant programs
- Amend R&D tax incentive structures

2.2. Grow the AI talent pool

Without AI scientists and engineers, entrepreneurs can't materialise their vision. We should heavily invest in developing a strong AI skill base in Australia, retaining the existing talent in the country, as well as attracting overseas AI talent. This should be done through several independent initiatives such as:

¹⁴ <https://www.gov.uk/government/publications/artificial-intelligence-sector-deal/ai-sector-deal>

¹⁵ <http://www.sciencemag.org/news/2018/03/emmanuel-macron-wants-france-become-leader-ai-and-avoid-dystopia>

- Launch of AI-specific student postgraduate scholarships
- Create special visa programs to attract overseas AI talent
- Enhance the support for Australian AI academics heavily involved in teaching or research supervision
- Significantly expand investment into machine learning and AI within Data61/CSIRO
- Sponsoring AI-specific academic chairs for Australian universities
- Significantly increase AI-specific funding for the Australian Research Council

2.3. Connect entrepreneurs to AI talent

A wide range of mechanisms is needed to bringing together entrepreneurs and AI talent, with the aim of spreading ideas, brainstorming solutions and seeding new SME and startup teams. A range of activities will provide opportunities for connections, communication and collaboration:

- Build innovation precincts in key cities that bring together eco-system participants
- Connect these innovation precincts between cities
- Promoting events that bring together diverse stakeholders to share ideas and make connections through conferences, competitions, pitch nights, startup weekends and tech meetups
- Assist in creating support organisations such as young entrepreneurs' organisations
- Placing entrepreneurs-in-residence inside research organisations
- Create local newsletters promoting the opportunities and events