

## Investigation

### In the public service? Artificial intelligence and government

***Artificial intelligence presents some marvellous opportunities for the public service. SEAN AUDAIN gives a summary of some of these along with the unique challenges.***

#### The digital experience

The human experience is increasingly a digital one. This digital reality touches our lives in a myriad of ways, from conscious actions like electronic transactions and streaming entertainment services to the more unconscious ones such as dynamic traffic management or Google searches. This digital experience is reshaping the expectations people have of their public services. Of the many strands that make up this digital reality, few are as hyped, misunderstood, or promising as artificial intelligence (AI). This article gives a very brief description of AI, it explores how it fits with other technologies that will reshape the way government operates, and it identifies what public servants should consider in developing and growing this capability.

#### The thinking machine

At the core of AI is the idea that people can build and train machines that can apply the autonomy, intelligence, and decision-making processes we use to perform tasks and respond to situations. These machines take the form of algorithms, sets of rules and equations written for a computer and then applied to sets of data. While the common image of AI is a robot, modern robotics is a distinct discipline and the vast majority of AI is operated within computers or devices. As AI has been developed, two major categories have evolved: General AI and Narrow AI.

- *General AI* – General AI is the AI of films and the public imagination – it is a synthetic intelligence that is recognisably human. This type of AI sees machines being able to display traits like abstract thinking, learning, reasoning, creativity, morality, emotional intelligence, and dealing with random occurrences. In short, General AI is equivalent to having an artificial consciousness.
- *Narrow AI* – Narrow AI is the AI most of us encounter – it is the algorithms that help produce weather reports, that are the computer opponent in our video games, or that count cars and bicycles in our streets. Narrow AI is exceptionally good at doing specific things, using a dataset of a particular type. Narrow AI is excellent at repetitive tasks that would fatigue, bore, or annoy a person trying to do them. Given that Narrow AI is the AI in commercial use today, this article will focus on Narrow AI.

To develop these artificial intelligences, people generally use two techniques: machine learning and deep learning. Machine learning is essentially training an algorithm to perform a task, for example, using recordings of breaking glass to teach an audio algorithm to recognise breaking glass in the street so cleaners can be sent out to clear it away. Machine learning comes in a number of variants depending on the nature of the training or the algorithm being used. Deep Learning is more complex. It seeks to mimic the way our neural systems work. Deep Learning takes the linear processes of machine learning and weaves them together to make webs that can support self-learning and basic reasoning.

The difference between machine learning and deep learning are important for public servants to understand because they have profoundly different ethical, transparency, and democratic decision-making considerations.

### **The art of the possible**

Government is an increasingly digital art, with almost every task from communication to application assessment, budget construction, and regulatory production having a digital dimension. As a tool, AI offers opportunities to free public servants to deliver better, more personal services and deliver more timely insights. AI has a number of potential advantages:

- *Automation* – There are tasks in the public service that are so mechanical, dangerous, remote, or tedious that they are often either not done or not done well. Generally tasks that involve repetition, counting, or limited decision making are suitable for automation. Examples already in use include understanding pest trapping metrics on offshore islands, counting swimming pools from aerial photographs for water-use planning, or counting different types of vehicles in road traffic.
- *Personalisation* – The personalisation that has helped make Google and Netflix the service leaders in their industries are also increasingly expected from public services. Chat bots can be used in application processes. This can make government services more accessible to a greater diversity of people and more effectively allow people to use public systems. An example of this is Better Rules, which is operated through Ministry of Business, Innovation and Employment and allows people to better understand their entitlements.
- *Accountability* – Machine learning can sit alongside people to ensure that key performance indicators and expenditure expectations are transparent, targeted, and being met. These auditing algorithms can publish their results to help set up and monitor budgets.
- *Augmentation* – Artificial Intelligence is not a binary technology, that is, it's not just about people or machines. It's about achieving outcomes. The augmentation of human capability using AI capitalises on the analytic capability of AI and the judgment, societal intelligence, and understanding of people. This augmentation allows public service managers to task capability away from data gathering towards interpretation and information production.
- *Awareness* – We live in a society where admitting we don't know is notable because it's so uncommon. The public often don't understand that search engines like Google know nothing – they find information given by others. AI and the data investment that is necessary to make it work can fuse understandings and make very large datasets intelligible, generating a far better awareness within the many ministries and departments of government.

This is not to say that these potential benefits do not come without costs – just as the application of our intelligence is highly influenced by our personalities and ethics, so too is the potential of AI. Government and technology share many similarities – good government, like good technology, builds humanity into its systems; poor technology, like government at its worst, is mechanistic and

inhuman. Government and technology also share an amplification quality – scaling poor decisions as quickly as good ones and amplifying the results.

### **Making the possible**

AI is often touted as a revolution, a phenomenon governments are often resistant to. Government is generally continuous and evolutionary. The question then is how can AI form part of the relationship between the state and its citizens, particularly in its various dimensions such as privacy, freedom, expression, identity, and safety. If we are to build a capability to realise the potential benefits of AI, we must do so in a way that avoids undermining trust, which sits at the heart of government. These are some of the challenges:

- *Abdication* – AI is a fundamentally different technology from many others as it allows for unsupervised decision making. The conscious exercise of power is key to our system of government, and the people responsible for using algorithms must not abdicate decision making to a “black box”.
- *Doing to versus doing with* – Government differs from private industry in its ability to compel and monopolise – customers have a choice of using a service, citizens do not. When setting up AI decision making, it needs to be clear who things are being optimised for. There needs to be measurable cultural values, and systemic errors must be able to be detected and corrected.
- *Visibility of ethics* – There is a great deal of literature on the bias of algorithms in decision making, but often this is a case of programming that reveals bias within the existing human systems. In these cases, it is important that government has a means of recognising these biases, preventing their propagation through AI, and improving the human systems the AI will serve.
- *Transparency* – AI is an arcane field that is not well understood. The public service must be fair, free, and frank, which requires openness. Companies can develop AI and then protect their intellectual property, but government can’t – it must remain transparent. If government is to develop a sustained relationship with industry and benefit from AI, then it needs clear data and procurement processes or it must develop it’s own capability.
- *Training* – The tasks that are first automated are often those that use junior staff or less-skilled workers. In this respect, AI must be deployed as part of workforce planning if the public service is to reflect the diversity of the country, and it needs succession planning to ensure there are pathways available for advancing people.

None of these challenges are unmanageable – but to safely and sustainably build an AI capability, the public service must be digitally conscious of its actions and investments.

### **Seeds of the future**

Government represents a particular challenge for the development of an AI capability because of the sheer number of industries and sectors it is exposed to and the variation in its roles. What holds true is that for intelligence to function, it must be able to learn – in AI’s case, this learning takes place through data. Government has been investing in its data estate under the Government Chief Data Steward and through work at LINZ and NZTA on data standards and investment paths. Similar foundational work can be found in the “rules as code” community, with pilot projects in ACC and

work on the RMA at Wellington City Council. In July, the government published the Algorithm Charter for Aotearoa New Zealand, a commitment to ensuring New Zealanders have confidence in how government agencies use algorithms. The charter is designed to demonstrate transparency and accountability in the use of data. What makes the creation of a public service AI capability different from those in other sectors is the requirements for disclosure and transparency. In this respect, the new Privacy Act and the insertion of open government into the purpose of the new Public Service Act represent useful anchor points from which to develop.

AI is already assisting the public service to help conservation, improve safety, and create better, more equitable systems. As AI is scaled and developed in the public service, it will be driven and governed by the relationship between citizen and state.