AWS puts the AI in Australia

How businesses get started, skill up and achieve scale for their projects.

aws

Introduction

It's less than five years since artificial intelligence burst back into the business conscious, but in that time it has made enormous inroads worldwide.

So often an early adopter of new technology, Australian business is once again living up to its reputation in the race to adopt AI technology.

The majority of large - think ASX50, household name - brands are already experimenting with some sort of AI - whether machine learning, deep learning, chatbots or robotic process automation, according to recent market studies. [1]

A growing number of businesses have managed to shift out of experimentation and into live production use cases.

And yet, we're still at the very beginning of where this current iteration of AI will lead us.

Analyst firm Gartner's much-referenced hype cycle shows a two-to-five year lead time before AI technologies such as machine learning and deep learning become a mainstay driver of business productivity.

That is perhaps overly conservative. The pace of technology development, innovation and adoption within the AI space at present suggests it will become a pervasive part of business' ways of working in a much shorter time frame.

This report shows businesses wanting to participate in the AI boom and accelerate their adoption and realisation of value should do three things:

- ◆ Get started
- ◆ Get skilled
- ◆ Get scale

In this qualitative study, we examine how six Australian businesses - ANZ Bank, nib, Airtasker, Stackla, Whooshka and Tech Mpire - are stepping through this journey.

We explore in detail their use cases, their technology choices, and how they envision their future in an AI-powered world.
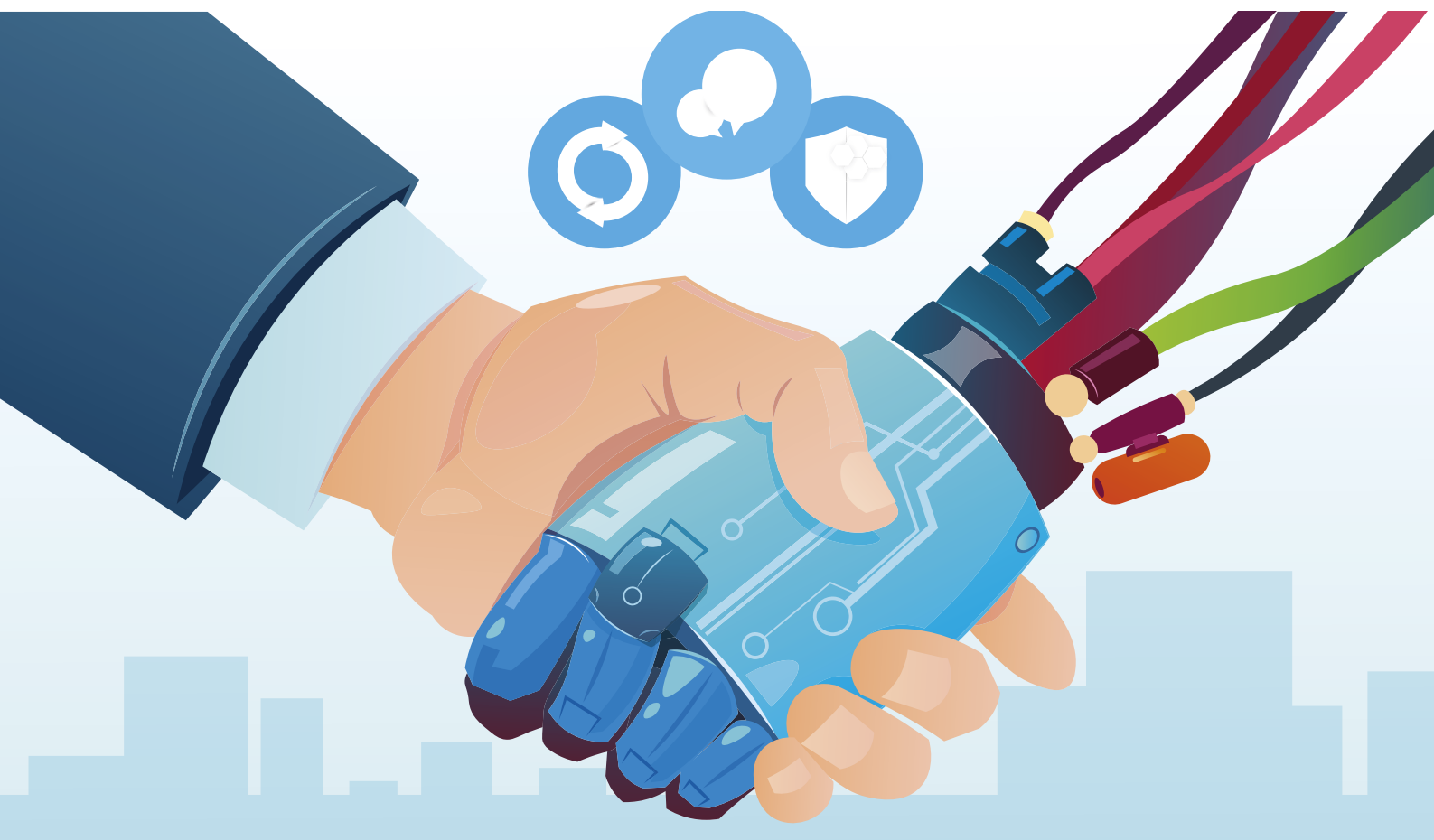
Get started

"The question that's often asked is, what is the business case to start investing in AI? The first part of that question should be: what do I want to get out of using AI within the business?"

-- Glenn Gore, Chief Solutions Architect, AWS.

Early adopters of AI have shown a willingness to get the technology in and experiment with it on a small scale to uncover potential use cases.

These companies are taking test datasets and spinning up inexpensive proof-of-concepts using AWS services like Machine Learning, Amazon Lex, Amazon Rekognition, Amazon Polly and Amazon SageMaker.

But even at this early stage, they are going in with at least some idea of the value that they hope to derive from their AI projects.

ANZ Bank wanted to improve the way it writes employee and operational policies and make them easier to understand.

"They could be internal policies for employees for gift and entertainment, travel or expense claims, policies around how much credit can can lend someone, or policies around operational risk and compliance," Group General Manager for Risk Transformation, Nick Reed, said.

Health insurer nib wanted to improve its customer experience.

"We weren't going to do AI just for the sake of it," Chief Information Officer Brendan Mills said.

"We wanted some sort of efficiency gain at the end of it, whether that be improved NPS [net promoter scores], improved customer retention, or lower operating costs."

Odd jobs marketplace Airtasker turned to AI because it needed to be able to categorise the enormous number of tasks posted to its platform for insurance purposes - though it also saw a broad range of potential use cases for machine learning, within reason.

"Getting lots of data is great and having insight is fantastic but what you need to find is what is actionable and what can give you a return on investment," Chief Technology Officer Paul Keen said.

Content marketing engine Stackla wanted to improve the accuracy of recommendations it made to brands about the best user-generated content to display in their marketing.

ASX-listed adtech firm Tech Mpire saw AI as a path to mitigate fraud and improve the quality of traffic for the online advertisements it served.

And podcasting platform maker Whooshkaa saw an opportunity to innovate in the media space, helping traditional players participate in new media hubs such as Alexa.

Only once these companies had a hypothesis for their use case did they go about trying to test whether it would actually hold up.

That is a departure from some of the earlier AI projects, where tech teams would effectively run as a skunkworks in order to understand the capabilities of platforms and determine whether the technology might be applicable to known business challenges.

For those with a start on AI, experimentation has often been a varied experience.

Understanding the limits of technology tools and platforms has largely been a process of trial and error. "It was a bit 'here you go, on your way'," Stackla's Product Director Steven Birchall said.

However, as AI platforms and services have rapidly evolved, these kinds of technology choices are becoming easier for those just starting out.

In addition, businesses that jumped into the AI space early are now able to replace any custom components with newer cloud-based services that have launched in the interim.

For some, adoption of AI is a natural extension of their adoption of cloud.

nib, Stackla and Whooshkaa all leveraged existing AWS relationships to quickly get started with AI.

"From an Australian perspective, we are heavily partnered with AWS," nib's Brendan Mills said.

"We've been working with AWS for quite a while around a number of initiatives, including a very significant push to cloud, and on some other significant pieces.

"They're very closely aligned to where we're headed so that drove the AI technology decision".

For Stackla's Steven Birchall, having AWS accounts and approvals in place also made for a pain-free start.

"The fact that we were already using Amazon for a number of things had benefits from costing perspective, in terms of not having to jump through hoops for internal budgeting and compliance," he said.

AWS Chief Solutions Architect Glenn Gore said Australian businesses had "built a huge amount of IP, expertise, and experience in how to refactor applications moving from on-premises to the cloud".

"We know how to build digital native applications, and how to be experts in DevOps and microservices," Gore said.

> *That's what's game-changing about bringing AI to the cloud: it allows us to use world's-best technologies that have been exercised billions of times per day."*
>
> -- Glenn Gore, Chief Solutions Architect, AWS.

Get skills

"Many people think it will just happen by osmosis, that their teams will pick up new technology skills over time. AI and machine learning are not in this category. If you want to deep-dive, it takes a conscious effort to learn the skills you need, and how you can apply those within the business."

-- Glenn Gore, Chief Solutions Architect, AWS.

As important as it is to get the technology foundation for AI right, businesses must also focus on developing the right skills internally to drive their AI ambitions forward.

Demand for AI is in part built on the rise of data science - a field in which there is already fierce competition for talent.

Those skills continue to be in hot demand as businesses look to scale up experimental uses and move deeper into AI, adding complexity with technologies such as deep learning.

There is widespread understanding among AI's adopters that the technology is not conducive to a set-and-forget type of deployment model.

While good results can sometimes be achieved with a minimum amount of effort, businesses recognise it takes time to train AI in order to achieve higher levels of accuracy - and better return on investment.

"We went in eyes wide open," nib's Brendan Mills said.

"The technology's good, but it's not the sort of thing you spend weeks or months on, put into production, leave it alone and it solves things for the rest of its working life. We're probably not at this stage just yet.

"What we've found is that we've certainly had to couple the technology with a fair bit of training. We're constantly refining it, teaching and helping it learn."

nib has dedicated resources in its frontline teams whose job it is to refine front-facing AI models.

That's been a win-win for the company, allowing nib to incorporate institutional knowledge into the AI while also upskilling frontline employees on an emerging area of technology.

"It's been great for the frontline employees because they get the opportunity to work on tasks outside of the transactional customer experience," Mills said.

"In time, AI could be potentially confronting from an employee experience perspective. At the same time, those who are learning about it are enjoying the experience and what they're able to do."

Stackla is also basing its AI efforts on internal skills. "We try and use as much in-house skill as possible," Steven Birchall said.

Responsibility for the "pinnacle data science work" at Airtasker rests with a data scientist who sits within a shared services team.

However, Airtasker's Paul Keen has found no shortage of volunteers internally wanting to skill up in the area.

"What I find interesting is every developer in our team has a learning path for the next 12 months, and a huge proportion of our people want to learn data science," Keen said.

"Everyone is seeing AI is becoming the next computer science mandatory requirement. "We're sending people on courses because it needs to be part of the culture.

"It can't be down to one person in the long term."

Get scale

"Typically, running a low latency, highly scalable and secure API in production is not within the core skillsets of a data science team. Proving the concept of a business problem using machine learning is one thing, deploying and managing it in production is a totally different game. Customers want to remove dependencies and the undifferentiated heavy lifting of managing machine learning pipelines. Simply, they want to scale their data science and development capabilities and narrow their focus on what brings value to the business. That is the reason you see a great focus from AWS on services such as SageMaker which enables data scientists to train models and push them to production in a few clicks." --Koorosh Lohrasbi, AWS Solutions Architect and co-founder of Sydney Machine Learning meetup group

One of the lingering challenges for AI is that while it can be easy to experiment, getting those experiments to scale up to production deployments can be a trickier proposition.

> " *We use AWS to scale up and down as needed, without having to concern ourselves with the underlying infrastructure.*"
>
> **-- Luke Taylor, Chief Technology Office, Tech Mpire.**

A lot depends on the architecture of the chosen technology, and the size and nature of the production dataset to which it is being applied.

Tech Mpire's Chief Technology Officer Luke Taylor saw that as a reason why the AWS AI ecosystem made sense.

"Our fraud mitigation solution consumes real-time data on a massive scale and we experience drastic fluctuations on an hourly, daily, and seasonal basis," Taylor said.

"We use AWS to scale up and down as needed, without having to concern ourselves with the underlying infrastructure."

Scaling is easier with automation, and in that regard the arrival of platforms like the Amazon SageMaker managed service for machine learning have captured the imagination of business.

"The whole process from development (of the algorithm) to taking care of the infrastructure to hosting and monitoring of it, is all simplified with SageMaker. We have also recognised cost savings from moving to serverless at compute, analytics, and real-time data processing," Tech Mpire's Raigon Jolly said.

"We are looking at SageMaker to help us manage our machine learning pipelines. It spins up the cluster, you give it the training data, and then it automatically scales up required training infrastructure and creates endpoints to be used for prediction and A/B testing.

"Auto-hyper parameter tuning also streamlines the development of our ML implementations.

"All this is really helpful to build our invalid-traffic mitigation platform, TrafficGuard, which like any security solution, needs continuous development inline with the evolving threat landscape.

"With the AWS platform including SageMaker and Kinesis Analytics, we are able to achieve a level of automation that helps us bring ML implementations to TrafficGuard faster. This enables my team to focus on developing trail blazing AI while leaving the foundational elements to AWS."

"The AWS offering around AI has changed a lot in just 12-18 months ago," Stackla's Steven Birchall added.

"Building upon some of the already very powerful offerings, new products like SageMaker will open up a whole host of new opportunities for our future development."

If scaling up is still a problem for businesses, it is not slowing their ambitions to drive AI deeper into their organisations.

ANZ Bank is expanding its use of AI both within the Risk function where its AWS experiments started, but also more broadly across the organisation.

For this, it is taking direction from the Risk function's project, which is viewed internally as a "real case study" for making AI work at scale.

"The time has come to stop doing proof-of-concepts and mucking around on the periphery because we've got enough information to know the answers," ANZ Bank's Nick Reed said.

nib is looking at expanding AI into frontline sales processes and backend claims processing. It is also examining its options in the 5-10 year horizon to combine AI with sensor data to help its insurance customers more proactively manage their health.

"We're watching that with interest to work on where we might play a role as an insurer," Mills said.

> **AWS cloud is giving businesses the confidence to start small, gain skills through online training and certifications, and then scale up those experiments to handle production datasets."**
>
> **-- Paul Keen, Chief Technology Officer, Airtasker.**

Airtasker's "longer-term play" is the creation of a recommendation engine for its platform.

This could help new users to the platform "have a really good experience" by pairing them with experienced workers; recommend tasks that new users can perform easily to build their 'brand' on the platform; or find tasks that were listed at the wrong time to attract quality bids, and recommend they be re-listed.

"To build these recommendation engines you've got to understand each facet of what makes something worth recommending," Airtasker's Paul Keen said.

"We can keep feeding those results back to the feature teams to either feed the machine more data or use that data to enhance the platform."

"AWS cloud is giving businesses the confidence to start small, gain skills through online training and certifications, and then scale up those experiments to handle production datasets.

What follows are case studies on how nib, Airtasker, Stackla, Tech Mpire and Whooshkaa got their start, acquired skills and achieved scale in AI. We hope it gets you excited to also begin your AI journey." --

Case study #1

ANZ
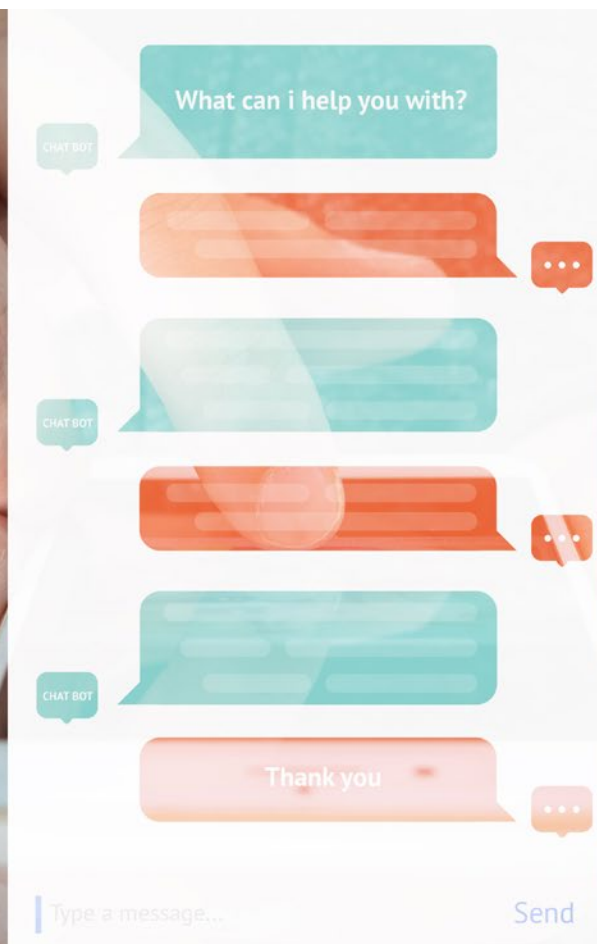
ANZ Bank is using a chatbot to give over 50,000 staff a definitive answer on everything from what they can and can't claim or accept as employees, to when they are able to sell down personal share holdings.

The institution's normally conservative Risk function has emerged as an early adopter and incubator for artificial intelligence technology.

In doing so, it has established credentials as a key source of domain knowledge and case studies that could help ANZ formulate an organisation-wide approach to AI use.

"Outside of Risk, ANZ is right in the middle of deciding its future as it relates to AI and chatbots," Group General Manager for Risk Transformation, Nick Reed, said.

"What we provided was a really good use case for the bank to make decisions around".

Risk defines the internal policies and procedures for the bank. It is not uncommon for these rules to be hundreds of pages in length, with new rules added all the time.

"Policy is additive," Reed said.

"At some point in our past, we decided there was a requirement to write something down that defined the way in which we should operate.

"What's happened ever since that date is we've added to that

document, but almost never reviewed what is already in the policy.

"We can tend to add policy rather than rewrite, reconstitute or rethink about the way that policies work, which is why they get so long and complicated and have so much internal broken logic."

Back in early 2017, the policies were mostly housed on the intranet, where employees would have to consult them to understand how to operate or conduct themselves in accordance with the rules.

Reed's team figured there had to be a more "humanistic" method of deciphering the documents.

Was there a better way for staff "to interact with those policies and procedures by digitising them and creating natural language processing engines and decisioning trees to guide things like chatbots?"

"That was when we gave ourselves the permission to start experimenting and exploring whether there were better ways of being able to write policy, understand policy, and make it more user-friendly for employees," Reed said.

Reed decided to run an experiment on four employee policies: gift and entertainment, travel, expense management and share trading.

His internal team crafted the decision trees, meticulously converting hundreds of pages of policy into a machine-readable form.

The Risk function engaged Melbourne IT to build the technology elements using AWS services including Lex, Lambda and DynamoDB.

The result is Polli, a chatbot designed to answer questions "definitively" - that is, with 100 percent certainty, or not at all. It is available to employees via iOS and Android apps, as well as on emerging communications channels like Slack.

The need to answer definitively was important to ANZ.

"For these kinds of policies it has to be 100 percent accurate: either it has to elegantly tell you that it can't answer or give you a definitive answer," Reed said.

"A big conversation we had with Amazon was to say our approach to this is going to be different.

"This is not about showing that we can be smart at guessing. This is about saying let's be rigorous about being accurate."

When employees can and can't trade shares they own is one

> ❝ *We can tend to add policy rather than rewrite, reconstitute or rethink about the way that policies work, which is why they get so long and complicated and have so much internal broken logic."*
>
> **-- Nick Reed, Group General Manager for Risk Transformation, ANZ Bank.**

instance when a black-and-white answer is required.

"We have different periods of time where parts of the bank have internal knowledge about what's happening with other companies, and we have lots of trading periods and blackout periods, so questions about when you are and aren't allowed to sell shares happens 1000 times a day," Reed said.

"We wanted to find a way to quickly use natural language to get an answer to 'Am I allowed?'

"This is driven by a decision tree that uses who are you, the type of shares you want to sell and the context in which you want to sell them to give a definitive answer and an audit log that you went through the process."

As ANZ allowed more and more employees to interact with Polli, the chatbot was able to recognise and respond to a wider variety of "utterances".

"There are lots of different ways of describing things to a chatbot but it's also a discrete number at some point in time," Reed said.

"We just needed to work out where the boundary was of how many different ways can you describe that you want to sell shares."

What has emerged from the project is that artificial intelligence offers a powerful way to write and present policy.

"The discipline required and the ease of use of being able to structure decision trees using the AWS technology is a really valuable way of writing policy," Reed said.

"We now use the tools and techniques that we used to build the chatbot to help us write and manage policy.

"We didn't start the project that way but it's absolutely the most valuable thing that we've learned out of this entire experience."

Risk is also a case study for broader adoption of AI across the bank. While the bank is still determining how best to proceed, Reed is sure it won't be through more experiments.

"The time has come to stop doing proof-of-concepts and mucking around on the periphery because we've got enough information to know the answers," he said.

"We've just got to work out the next step." ∎

Case study #2

nib

Health insurer nib is making its first Australian Artificial Intelligence play with its Australian chatbot, nibby.

Built on the Amazon Lex deep learning chatbot service, nibby is designed to improve the way customers interact with nib and find information about their policies.

"nibby is really about trying to give some simple information back to customers about their everyday queries," Chief Information Officer Brendan Mills said.

"It also tries to get customers to the right resource as quickly as possible, whether that be to online chat, to speak to an agent in our contact centre, or to the customer portal.

"It enhances the quality of the conversation and the likelihood we can successfully close out the experience or customer call."

nibby is a joint project by nib's customer experience, digital and technology functions. It is being trained by frontline customer-facing employees to improve its efficacy.

Some of the training is about finding and fixing "dead-ends" - where a customer exits the interaction with nibby prematurely.

The ability to exit is built into nibby, but Mills and his team want to understand why a customer does it.

"We allow a step in the process or in the logic flow where a customer can say they just want to speak to a human," Mills said.

"We want to spend a fair bit of time analysing those instances to understand why it happened.

"Was it because someone didn't want to talk to a chatbot or because we have a dead-end there and they went around in circles because we couldn't actually answer the query?

"Quite often, we'll find it's because the customer is talking about a claim type we hadn't recognised in the utterances that might come through, so you embed that change, test the process again, and all of a sudden it's not a dead-end anymore.

"It's trying to make it the best customer experience we can make it."

nibby is built on a full AWS stack, comprising the Lex chatbot service, AWS Lambda for integration fulfilment, Amazon Cognito for authentication and AWS S3 for static hosting.

Mills said AWS was a logical choice because nib is presently involved in "a very significant push to AWS cloud".

"We've been working with AWS for quite a while around a number of initiatives," Mills said.

"Most of my tech employees are very close to the stack, and we work with [award-winning AWS partner] DiUS who are closely aligned to the AWS stack."

nib is "absolutely committed" to continue investing both in nibby and in future applications of AI across the business.

Some enhancements to nibby are predicated on the arrival of a locally-hosted instance of Lex, given the likelihood of sensitive data being transacted over the service.

Mills wants to expand the type of transactions that nibby can assist with, offering customers a way to update their contact details or change their payment type.

"We're really looking to get to the point where some of those transactions can be done 24x7 straight-through without the need for a [contact centre] consultant," he said.

"Yes, some of those functions you can also do online but I guess the benefit of a chatbot is that it almost guides you through the process."

nib also sees an opportunity for nibby to handle the end-to-end process of signing people up to new health insurance plans.

"We get a lot of inquiries around sales so how can we create a

sales experience by leveraging that chatbot?" Mills said.

"Ultimately, we will still have the ability to hand off [a sales inquiry] to a human, but we want to get to the point where we can have the prospective customer go through a sales flow, be provided with the information they need, and perform a needs analysis as we go.

"Questions like 'Are you looking for hospital cover? Yes? Well here's our hospital cover. Do you think you'd need more or less cover'?

"This is what a consultant does when they take a call in the contact centre."

In the longer term, nib is watching the smart connected device space with interest.

Mills believes the combination of AI and Internet of Things (IoT) could play a major role in proactive health management in the next five-to-ten years.

"There's a whole space around IoT and using AI and sensors to provide better population health outcomes so we can intervene earlier using technology to gain insights that would ordinarily have been unaffordable or not cost effective to be able to monitor," Mills said.

"We think there's a whole raft of things in that space that will probably come of age in the 10-year horizon.

"We're watching that with interest to work on where we might play a role as an insurer." ▪

> **We've been working with AWS for quite a while around a number of initiatives"**
>
> -- Brendan Mills, Chief Information Officer, nib.

Case study #3

Airtasker

Airtasker, an Australian-based marketplace where you can outsource everyday tasks, is expanding the integration of AI capabilities into its business.

The service boasts over 1.6 million users and $15.4 million worth of jobs advertised each month.

"The general value proposition of Airtasker is we're connecting people who are trying to get tasks done with people who are trying to work for those tasks," Chief Technology Officer Paul Keen said.

"On Airtasker you don't want a house cleaner, you want your house cleaned.

"You want the end goal and we are financially tied to making sure everyone turns up and does the job."

Artificial intelligence at Airtasker involves a mix of AWS and proprietary algorithms, and Keen sees this hybrid approach as being right for the company.

"Image recognition and voice recognition are very hard to do," he said.

"It takes a lot of specialist skills and you need a lot of data to be able to get it right.

"Clearly those are services we won't venture into ourselves. Then you have services that might be customised for Airtasker or where we have capabilities we want to be able to enhance and that's where we would do it ourselves."

Where AWS already offers an AI service, Keen sees no reason to reinvent the wheel.

"For example, there's no point in us building an image search algorithm given the data and learnings Amazon have in its Rekognition service are far greater than we could ever achieve, so we just leverage off the back of that," he said.

Keen said he looked for "capability and extensibility" when evaluating third party AI services to incorporate into Airtasker's environment.

Airtasker is now looking to trial Amazon Comprehend, a new natural language processing service that can discover insights from text.

One of the challenges with running a marketplace is that a small number of users will try to circumvent established processes.

"For example, what we notice is in the text people will spell their mobile number phonetically," Keen said.

"If you share contact information [in your profile] there's a high propensity to take us out of that process."

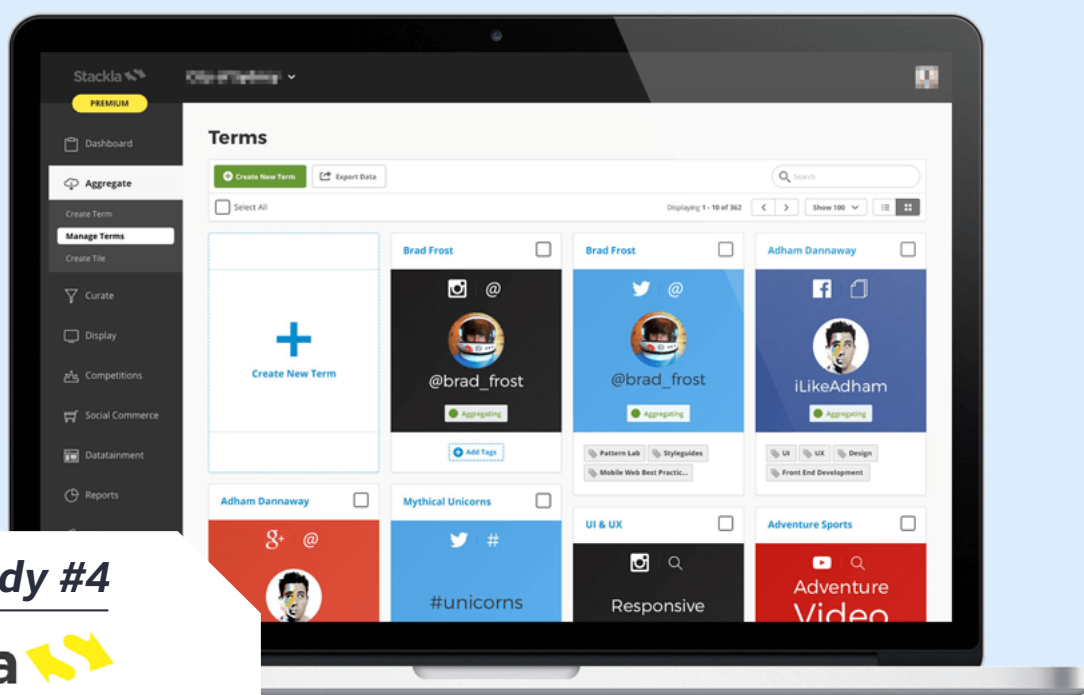Keen is looking to speech recognition to solve the challenge.

"We'll do text-to-speech and then we'll send that speech back into text," he said.

"That will turn phonetically written-out [phone numbers] back into numerals again so we can process it."

"We're constantly enhancing our AI capabilities and learning as we go." ∎

Case study #4

Stackla

Marketers know the power of a strong customer voice. Good things customers say hold far more sway than anything a brand says about itself.

This has been amplified by the internet and social media, where there is an enormous array of channels in which customers can share their - often positive - experiences.

Big brands are increasingly turning to platforms like Stackla to stay abreast of everything that is being said - and to find a way to promote the best user-generated content in campaigns.

"Companies are moving away from brand-centric marketing to customer-focused marketing," Product Director Steven Birchall said.

"Stackla is a content marketing platform that allows customers to aggregate user-generated content around their brand, product or service. Users can then curate the best of that content and push it to any marketing channel — website widgets and eCommerce integrations, big screen and digital-out-of-home display, social and display advertising and so on.

"A common piece of feedback we have from brands that use Stackla is there is so much user-generated content out there about our brand, how do we move through that and surface the type of content that aligns best to our brand guidelines and more importantly, will engage our audience?"

In June 2017, Stackla launched Co-Pilot, a machine learning-powered content recommendation engine to help companies publish better content with less effort.

When a company signs up to use Stackla, they aren't hard-coding their brand guidelines into the platform.

Instead, the platform learns and recommends content it thinks the brand and its audience will like. The brand has final say on what content it surfaces - for example, through a Stackla-powered widget on its website.

"What it's trying to do is look for data on a particular brand in terms of

what content they're always approving," Birchall said.

"It takes whatever our data is able to extract from the user behaviour and actual pieces of content that they're curating and publishing."

"From that it tries to build a pattern with a certain level of confidence, and what it will do then is look for other similar content that's been aggregated into their stack which matches that pattern."

With the aid of Co-Pilot, Stackla is able to see what content is successfully approved or discarded as well as how a brand's audience interacts with that content and adjust future content recommendations based on that analysis.

Within the first fortnight of using Co-Pilot, most companies see content recommendations being made with an 85-to-90 percent degree of accuracy.

"For some customers whose use cases, patterns and types of content they want are easier to define, we've been able to work with them and tweak the model to get beyond that 95 percent accuracy level," Birchall said.

"For others, we are still learning and we're having to constantly review what kind of data and insights we're getting in to try to understand how we can get those extra percentage points."

AWS is at the core of both Stackla and Co-Pilot.

"We've had a pretty strong relationship with AWS since we started using them six years ago," Birchall said.

"We use AWS for the core machine learning component of Co-Pilot.

"AWS made a lot of sense in terms of being able to make the model our own, being able to start at ground zero and really tweak and work it to suit Stackla." ■

Case study #5

TechMpire

Australia's online advertising spend topped $7.6 billion in the last financial year; worldwide, the number was somewhere in the vicinity of $560 billion.

For global adtech company Tech Mpire, the goal is to enable advertisers to get the best return for online advertising spend.

"Fraud is major concern in the industry, and with the launch of TrafficGuard® in 2016, we were the first ad network using AI to proactively block invalid-traffic. In doing this, we deliver on our selling proposition to provide genuine traffic, not bots or IVT and maximise return on ad spend," Chief Technology Officer Luke Taylor said.

TrafficGuard is Tech Mpire's proprietary invalid-traffic mitigation solution, which uses AI to find and weed out sources of poor quality or fraudulent clicks or app installs.

"We analyse everything," Taylor said.

"Over the past 30 days we've processed close to two billion transactions."

Tech Mpire has spent the past two years fine-tuning its data pipeline and data lake, enriching the data before turning machine learning onto it to find patterns and get better at weeding out bad traffic.

"Our semi-supervised machine learning algorithm is trained on what we consider valid traffic. The model is able to learn the norm and predict traffic conforming to the norm well. Traffic

> **" Sometimes we've used other tools to get started and see what the machine learning can do and then we look to AWS because it's simpler to manage"**
>
> -- Luke Taylor, Chief Technology Officer, Tech Mpire.

outside the norm, which the model was not exposed to during the training process, will have less accurate predictions and higher reconstructions error. Sufficiently high reconstruction errors are then used to flag invalid traffic when the model is applied to new data," Taylor said.

The company began with self-managed infrastructure but is increasingly pushing more of its artificial intelligence workload through AWS.

"Sometimes we've used other tools to get started and see what the machine learning can do and then we look to AWS because it's simpler to manage," Taylor said.

Tech Mpire's Head of Analytics & Data Science, Raigon Jolly, believes AWS will play a much greater role in underpinning the company's machine learning projects.

The company is trialling Amazon SageMaker managed service, which can be used to build, train, and deploy machine learning models.

"We like the simplicity of working with SageMaker. In the past, there has been a lot of steps involved in productising workloads," Jolly said.

With SageMarker, infrastructure, hosting, monitoring, and scaling are all streamlined which means Mpire's Data Science team can focus on AI that drives our competitive advantage."

Jolly predicted Amazon SageMaker will become the company's "go-to" platform for machine learning and deep learning.

"The highlight for us is how it's going to halve the time to develop our machine learning capability allowing us to bring our AI innovations to our clients sooner and my team to focus on building our competitive advantage," Jolly said.

"That is quite significant, and I think it will be really revolutionary for us." ∎

Case study #6

wh⌒⌒shkaa

Rob Loewenthal remembers when podcasting began to take off back in 2012. The then- Managing Director of the Macquarie Radio Network saw firsthand the trend of listeners wanting to consume audio content on-demand.

"We were very interested in the analytics but I'd go to my digital manager at the time and say how did we perform last month and his answer would be in terabytes," Loewenthal said.

"People would say to me 'last month we did 10TB of data' and I never knew how many downloads that equated to. Obviously we were more interested in how many humans actually listened to the content.

"So I set out to find a solution to that problem and we did."

The result is Whooshkaa, an end-to-end audio solution that provides free hosting for podcasters, as well as analytics, distribution, editing and the ability to stitch in dynamic ads.

The platform was built two-and-a-half years ago and launched about two years ago. It backs onto an AWS infrastructure stack.

Though podcasts have been around for a number of years, their use has steadily increased in recent times as popular podcasts like Serial have achieved widespread appeal.

"The numbers are also going up because the technology is coming on," Loewenthal said.

"More importantly, we've got some great new advancements with

connected homes and connected cars, so it's now easier to listen to digital audio than ever before."

Connected home devices like Amazon's Alexa are now driving demand for voice-based information.

Whooshkaa is helping companies get their information into audio format for consumption on these connected home platforms.

It is doing so with a new feature in its platform that is enabled by Amazon Polly, a cloud service that converts text into lifelike speech.

Launched in May 2017, the feature already allows The Australian newspaper, for example, to create an audio news bulletin in real time by combining their top stories of the day into a single podcast.

"We take a news RSS feed from them, pick up the first paragraph from the top 10 stories in real-time, stitch it together as a piece of content, and generate a podcast, and that podcast is shared on their website and into Alexa and other connected home devices," Loewenthal said.

Loewenthal saw newspapers as a key early market for his

technology, since they had content that other people were monetizing.

"I remembered thinking a lot of radio show hosts would actually sit in the studio and read the newspaper out loud live on air," he said.

"In Australia there's about $1.2 billion of ad revenue in the radio industry and $40 billion globally, and no newspapers were getting that revenue.

"Their content is used extensively in the production of radio shows. So I went to them and said 'why don't you compete with radio? You should be doing it yourself'."

Whooshkaa and the Amazon Polly integration are finding wider uses. The same technology is used to provide live football scores

> **"** *With Amazon Polly, it's really given us the opportunity to take podcasting and our infrastructure to another level and provide different use cases to different companies"*
>
> -- Rob Loewenthal, Founder, Whooshkaa.

on behalf of Telstra.

"They wanted to generate live scores for football teams so you ask Alexa about the game at the moment and they use our technology to generate live scores," Loewenthal said.

"When the games aren't playing we generate a story about the team, how they're performing on the leaderboard and some other statistics and that's read out."

Loewenthal demonstrated a third use at the AWS re:Invent conference, where he personalised a podcast for himself consisting of the weather, his commute conditions and a topline view of outstanding IT support tickets from Jira - which he could request to play via his connected home device, rather than having to check multiple sources.

"With Amazon Polly, it's really given us the opportunity to take podcasting and our infrastructure to another level and provide different use cases to different companies," Loewenthal said.

"Because audio is so mobile, relevant and convenient, you don't need to stop what you're doing to look down at a screen.

"You've got this perfect storm at the moment, with technology advances, great new content in digital audio and time-poor audiences.

"These factors are creating an environment where audio is beginning to thrive, and we'd like to think we're at the coalface of that with Whooshkaa." ■

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