

Artificial Intelligence in Action: Case Studies Summary

July 2019

TOWARDS OUR INTELLIGENT FUTURE TE ARA MŌ TĀTOU ATAMAI O ĀPŌPŌ

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Summary

Artificial Intelligence in New Zealand: Case Studies Summary

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July 2019

OPINION AND SUMMARY

New Zealand AI deployments range from off-the-shelf chatbots to complex bespoke models. Vendors are finding success with more mature use cases such as chatbots, conversational AI and digital humans.

Other organisations are building their own bespoke AI solutions in-house. Spark says its AI use cases are niche and complex. It is better for Spark to use an internal talent pool than try to fit a vendor solution to its needs. Spark's agile teams also experiment and innovate with AI, usually without vendor involvement. AgResearch designed its translational research project in part to help its cross functional team learn by doing. The proof-of-concept will inform a 'buy vs build' decision in the future.

New Zealand AI vendors and enterprises both say it is difficult to find the right skillsets for their teams. There are also problems accessing data; a critical component to train a machine learning model.

The benefits of deploying AI solutions vary depending on use case. The most quoted benefits are that AI can work 24/7 and be faster, more accurate and consistent than humans for specific tasks. These benefits enable operational efficiencies.

AI solutions can also improve revenue. Ambit says its conversational AI solution results in increased sales conversions. AI solutions can improve loyalty and advocacy. FaceMe says its digital humans bring 'humanness' into a digital customer experience. This improves customer advocacy.

The interviewed companies say there are three key prerequisites for success with AI. First, organisations' customers should already be interacting with the company in a digital way. Second, the company must be able to expose the datasets required for the solution. Third, companies must be able to deploy security and privacy measures to maintain trust in the AI solution.

COMMON USE CASES

IDC interviewed New Zealand AI vendors and end-user organisations for case studies for the following use cases:

- **Digital Humans.** FaceMe is a digital human platform that uses AI to create a natural humanlike interface for machine to human communication.
- **Conversational AI.** New Zealand start-up Ambit deploys chatbots on its conversational AI platform.
- **Transfer Learning.** Precision Driven Health is working with Waitemata District Health Board. They will create a machine learning model they can transfer to other healthcare use cases.
- **Program Advisers and Recommendation Systems.** AgResearch is developing its own machine learning model. The model will classify and extract data from scientific literature to enable scientists to undertake better translational research.
- **Intelligent Document Processing.** Xtracta's AI powered system uses AI technology to read, understand and process documents.
- **Intelligent Analytics.** Spark uses bespoke AI solutions to analyse massive telecommunications data sets. For example, to predict and prevent churn.
- **GeoAI.** Orbica runs geographic imagery through an AI model. Its geospatial analytics system derive intelligence, such as feature extraction.

AGRESEARCH'S COGNITIVE TEXT MINING FOR NITRATE LEACHING SOLUTIONS

Research is a New Zealand Crown Research Institute. Its science and technology intend to benefit New Zealand agriculture and the wider economy and society. The institute conducts research and develops solutions across all sectors of the pastoral agriculture including pasture seeds, pest control, high value food production, and farming systems. The faster scientists can find solutions to problems the agricultural sector faces the more advantage New Zealand gains on the world markets.

Often solutions to problems already exist but scientists need to find linkages and solutions that apply in their domain. For example, a scientist discovers a statement that says, "a affects b". In another source a statement says, "b affects c". The scientist can infer a relationship between 'a' and 'c'. These statements are often in different pieces of research literature. As mentioned before, it's getting harder for humans to conduct literature reviews when there is a vast number of new scientific publications.

AgResearch recognises how AI has the potential to change the way it does science. It wants to utilise AI powered literature related discovery as a way of finding out new hypotheses to test. The company is particularly interested in discovery within the field of nitrogen leaching. There are a number of expert scientists in this field in New Zealand. The subject will be a good test of the system to see if it can find hypotheses scientists have not yet found. AgResearch says the issue is a pressing challenge for the New Zealand agricultural sector.

AgResearch is taking a 'learning by doing' approach to understand what AI can do. In part, this learning will help the institute make a later decision around whether to 'buy' or 'build' a production solution.

BENEFITS

The benefits of using an AI powered solution to solve a business problem depend on the use case the organisation is deploying.

For AI powered chatbots and digital humans, Ambit, FaceMe and JRNY said the benefits to end user organisations are:

- **Standardised and consistent responses.** Fewer repeat calls. More consistent responses than with humans and fewer errors made.
- **High availability 24/7.** The consumer can interact with the business at the time and place it suits them.
- **Immediate responses.** No queuing or putting customers on hold.
- **Each interaction improves machine learning.** Analysing the data set of the customers' interactions with the chatbot means companies can make faster, better, fact-based decisions and improvement actions.
- **Reduced workload for humans.** Shift human resources to higher value work.

- Increased sales conversions. Increased conversions for sales journeys where chatbot makes quoting and signing up easier.
- **Higher customer advocacy by bringing humanness into the experience.** This includes emotional context and the embodiment of brand.

The benefits Xtracta noted for its AI powered automated data entry software are similar in nature to benefits of a chatbot. The solution means standardised more accurate data entry, continuous service (available 24/7), auditability of data streams. The system learns from each document it receives for processing. Further benefits include improved customer satisfaction, gaining operational efficiencies, and cost reduction.

Precision Driven Health said the benefits of an AI Transfer Learning model are:

- Transferring model to different use cases.
- Better insights from multiple data sets.
- Time and cost savings.

CHALLENGES

People

Nearly every organisation IDC spoke to identified recruiting for AI skillsets as a challenge. This includes recruiting data scientists and software developers. AI vendors noted that larger companies can offer candidates higher salaries. This makes it hard for start-ups to compete for candidates. Interviewees told IDC that it is hard to find candidates proficient AI and with domain expertise. Spark solved this by creating a multiskilled team.

Both vendors and enterprises said gaining engagement can be a challenge. There's three parts to this. First, people in the organisation need to be comfortable with what AI (and isn't) and how it can benefit the business. Second, it can be difficult to change mindsets, or "the way we do things around there". Third, cross functional AI teams must develop a common language for a base understanding of each other's expertise.

AgResearch is taking a 'learning by doing' approach to engage end users. The company recognises it needs this approach to help build engagement and change its employees mindsets. The scientist's mindset traditionally was to filter down datasets to what they already think might be the solution. AgResearch's AI system analyses all the available data to seek a solution. 'Learning by doing' helps users to switch mindsets to explore different methods of using literature to solve problems.

Data

Data is the core foundation of AI solutions. Gaining access to data is a top issue. It may be difficult to extract from source system or BI systems. One vendor said public data is not always easy to access and does not come in easy-to-use formats.

Gaining approval to use data can be troublesome. There are issues to consider around data security, privacy, ethics and social license. Cleansing data to make it acceptable for use can also be challenging. For example, Precision Driven Health needed access to a set of historical triage records. PDH needed to gain data ethics approval as well as anonymise the data. Anonymising free text data has proved challenging as links to individual's identities are difficult to find.

The cost of data can be a barrier, for example purchasing Google Earth data. This can mean small to medium commercial enterprises can't develop AI solutions because they can't afford to source data to determine feasibility.

Customisation

Off-the-shelf AI products may still need customisation. For example, chatbots need geographic specific personalities. A Brazilian chatbot will have a different personality to a Chinese chatbot. There are geographic and

cultural linguistic modalities to consider as well. For example, how might chat bots understand sarcasm, hyperbole or humour?

Orbica notes that GeoAI solutions need customisation for different geographic areas. The machine learning needs lots of training data to make a universal model. A geographic AI product for New Zealand is unlikely to work in Mexico. There are differences in image quality, light and shadows, types of buildings, types of environments, for example. Organisations should seek to understand the level of effort required when it considers which vendors and whether to buy a solution or build a solution.

Deploying, Productionising and Scaling Up

The time delay between a proof of concept and Productionising an AI model can be a challenge. Over time, situations change, inconsistencies develop, or datasets may look different. The project team may need to rework the model before putting it into production.

Scale can be a barrier to adoption, particularly if it is not considered early on. Spark found it could be difficult to productionise and scale proof-of-concepts. Now it considers how to solve scale and production issues when the team is running a proof-of-concept, not afterwards.

Organisations can come up against issues by biting off more than they can chew. For example, Spark's earlier projects involved a wide variety of experimental solutions. Often the team needed to pivot fast in their thinking. They recommend starting by solving smaller, specific problems.

AI Vendor Challenges

The AI vendors that IDC spoke to noted two other key challenges. First, raising capital can be challenging, particularly for the complex R&D required to get the product to a sophisticated level. Second, it is still an early adopter market. This means there is still a lot of "unknowns" and market education and getting traction with customers can be a challenge for service providers.

KEY REQUIREMENTS FOR SUCCESSFUL AI PROJECTS

Before embarking on a customer-facing AI project, customers should already be interacting with the company in a digital way. The organisation should also be in a position to deploy security and privacy measures. This is to maintain trust in the AI solution especially where it interacts with customers. It is critical for success that an organisation can expose data sets essential for AI machine learning models.

One AI vendors recommends the organisation creates a Centre of Excellence before embarking on AI projects. Centres of Excellence can build influence and autonomy which improves action and results.

KEY TAKEAWAYS

- Collectively, these case studies highlight several common takeaways. These include:
- Understanding from the outset whether AI is the right solution.
- Teams and organisations developing knowledge through learning by doing.
- Engaging a cross-functional team to achieve what siloed teams could not.
- Involving end users at the beginning of development
- Deciding what automation can and can't do as some tasks require human input
- Starting with a small project, then scaling once knowledge and performance are developed
- Ensuring that components of initial projects will produce useful products in their own right
- Taking the time to develop datasets, learn processes and experiment
- Ensuring data is sufficient for the goal.
- Using an iterative process and refining initial experiments
- Capturing, analysing and acting upon the data AI projects produce



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The Artificial Intelligence Forum of New Zealand is a non-government association with a mission to harness the potential of Artificial Intelligence (AI) to help bring about a prosperous and inclusive Future New Zealand.

The rapid development of AI technologies presents major opportunities and challenges for our country: from creating world leading AI businesses, nurturing a pool of talented AI engineers, applying AI technologies to our agriculture, government, manufacturing and service industries to holding a meaningful national debate on the broader implications for society, New Zealand needs to actively engage with AI now in order to secure our future prosperity.

The Forum brings together citizens, business, academia and the government connecting, promoting and advancing the AI ecosystem to help ensure a prosperous New Zealand.

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