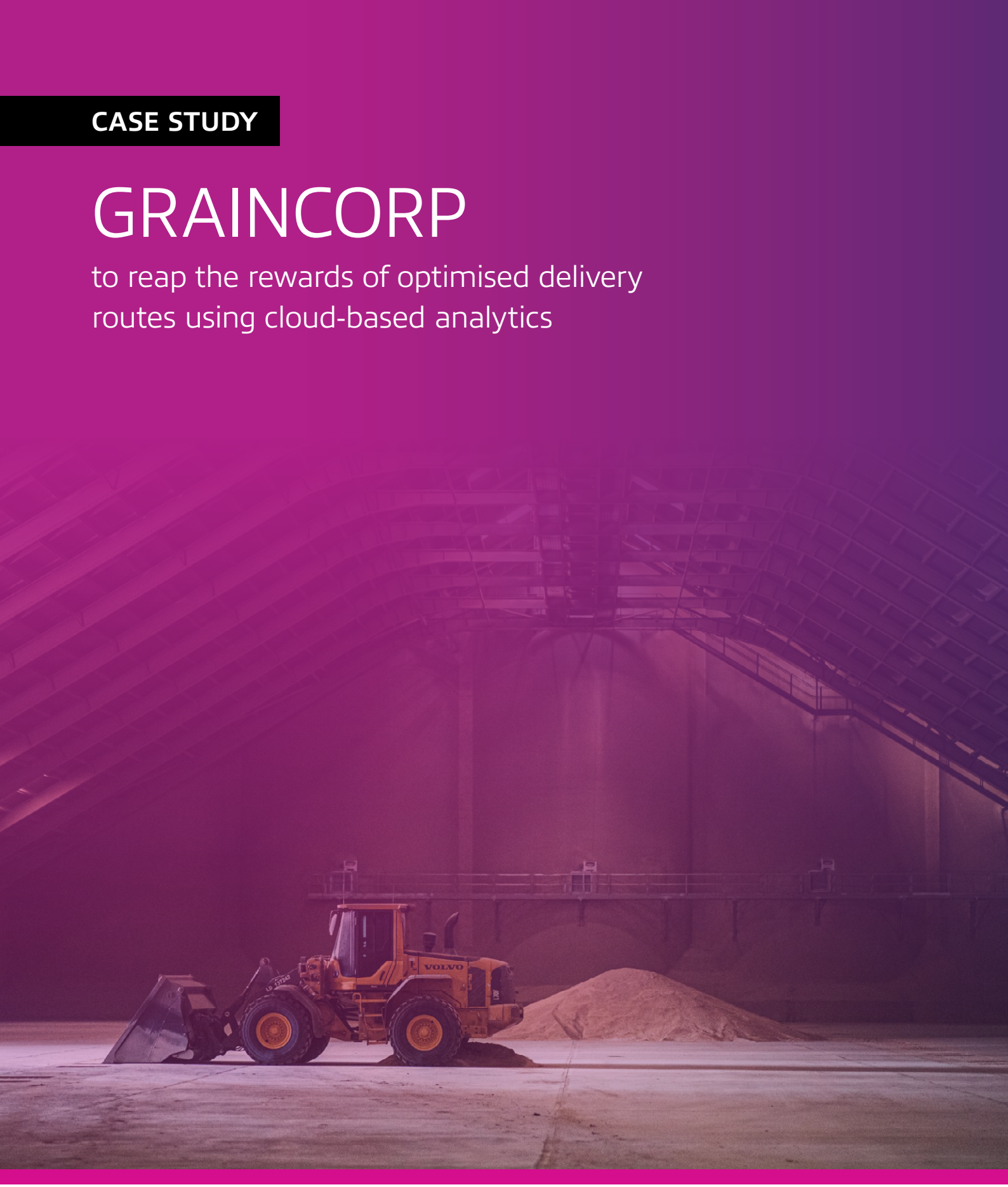
CASE STUDY

GRAINCORP

to reap the rewards of optimised delivery routes using cloud-based analytics



Insight

GrainCorp

Imagine you have a range of different grades of wheat, stored at a combination of silos, sheds and bunkers across the east coast of Australia.

There are local customers who want to feed it to livestock or process it into flour. There are international customers relying on bulk carriers to supply them with Australian grain to meet their production plans.

What's the most time- and cost-effective combination of truck and train journeys to fulfil this demand while reducing the total distance travelled? It sounds like a brainteaser puzzle but it's a challenge GrainCorp faces daily, as it seeks to use resources more efficiently.

GrainCorp is a leading Australian agribusiness and processing company that partners with grain growers and producers to connect them with customers in Australia and more than 50 other countries. From more than 160 sites across the east coast of Australia, it handled 34.4 million tons of grain in the 2021 financial year and exported 7.9 million tons.

The company uses the expertise of a team of data professionals to solve challenges like maintaining grain stocks to meet forecast demand.

"Most of the analytics work that we were doing was very ad hoc," says Pip Garner, Head of Analytics at GrainCorp. "There was no consistency in our process and we were reliant on individuals to maintain different models. On top of that, access to data was really challenging."

Analysts would typically run data models using Microsoft Excel spreadsheets and send updates to source data by email.

We saw the opportunity to [find a technology] partner with better tools to make the process more systemised and repeatable. – Pip Garner

Building a cloud platform for data analytics

GrainCorp approached Microsoft, which recommended key certified partners from which, through an evaluation process, GrainCorp selected Insight Enterprises. The Microsoft Partner specialises in integration solutions and has 12,000 employees worldwide.

In early 2021, Insight conducted a data estate assessment to understand how GrainCorp operated its analytics and start building a pathway to a more efficient, cloud-based operating model.

"I started to speak to GrainCorp about machine learning, the different tools their teams were using, their pain points and some pathways I had seen working with organisations in the past," says Julian Wise, Principal Consultant at Insight.

"I was excited to work with them, especially considering the importance of food security globally. Whether you're looking at the floods in Australia or the war in Ukraine, anything we can do to get food distributed around the world more effectively is for the better."

Based on this assessment, Insight and GrainCorp designed a cloud infrastructure for analytics using a Microsoft Azure Data Lake with Databricks as the core computation drive. The infrastructure uses Azure Data Factory to orchestrate the integration with data sources across GrainCorp, and Azure Key Vault to securely store sensitive information.

"The Insight team were good at guiding us through the entire process," says James Drummond, lead architect at GrainCorp. *"Through that emerged the Databricks platform, which is a leading data science platform, and a way to ramp up and ramp down to meet short-term computational demand. "We're no longer paying for more costly fixed IT infrastructure that must be scoped to meet total peak demands. We're able to leverage IT as a utility with greater scalability."*

Optimising routes and resources

GrainCorp and Insight identified up to 25 use cases that could benefit from the new cloud infrastructure and selected a pilot project – the freight optimisation model.

"The [original freight optimisation] solution was working in a technically immature way, running locally on a single server, but it worked," says Wise. "There was a lot of manual work, and it ran slowly. "GrainCorp knew there was a way to improve the operations, speed up the calculations, standardise the workflow and integrate it with their systems, to remove the manual work from performing the calculations."

Combining the cloud platform with a proprietary routing algorithm, Insight and GrainCorp quickly prototyped the route optimisation model. This included a workflow that would update the central data store whenever a data analyst uploaded a spreadsheet with the latest grain volumes in each silo.

"It only took us about 12 weeks to get from the first ideation of what the model would look like to a minimum viable product," says Garner. "We try and find the cheapest and most efficient route anyway – we don't like to waste time and energy," says Garner.

The opportunity now is we can capture and use data in a way that provides insights beyond cost and volume optimisation, such as our strong commitment to environmental, social and governance reporting.

Deploying new analytical models with speed and flexibility

The flexibility of the cloud infrastructure has given GrainCorp the ability to develop and deploy new solutions quickly. "Once they've solved one problem, they can apply that solution to the next problem in an almost cookie-cutter fashion," says Wise.

GrainCorp has since deployed another model that helps to match current supply and demand without overcommitting stocks that will be needed by customers over the coming 12 months. It combines two predictive models to recommend which stocks to keep, and where to keep them, to meet the predicted demand.

"It can effectively tell you that you need to retain 30,000 tons of high-protein wheat for a specific customer that's going to call on it in six months' time," explains Garner. "That's not something that you would expect any individual to be able to predict, based on the size and complexity of our network. We've been really happy with the accuracy of that strategic tool."

This flexibility has enabled the team of analysts to do more with less, according to Garner.

"We've got a significant pipeline of use cases that we'd love to deliver, adding more value for the business and helping with that decision-making process, by providing better analytics and more robust decision-making across the value chain," she says.