



Swinburne University takes IoT to the Nth degree

Customer success story





Customer Profile

Swinburne University of Technology is a world-ranked university, creating social and economic impact through science and innovation. It was founded in 1908 to serve those without access to further education in Melbourne's eastern suburbs. With three campuses in the Melbourne metropolitan area, as well as one in Sarawak, Malaysia, Swinburne has an international reputation for quality research.

New challenges

Swinburne sought a technology partnership to support the educational and research programs of the university's Manufacturing Futures Research Institute and Internet of Things (IoT) lab, as well as for expanding industry research impact in agricultural IoT and supply chain optimization.

Swinburne also looked to partner with a software company with an agile and scalable IoT platform to support and integrate directly with research customers.

Software AG solutions

Cumulocity IoT, IoT Edge, Streaming Analytics, Machine Learning

Key benefits

- Live monitoring of milk quality, temperature and quantity before and during transport
- Prevent milk wastage by optimizing milk pick-up
- Eliminate unnecessary journeys and decrease transportation costs
- Provide accurate milk supply forecasting
- Increase milk processing plant production efficiency
- Enable Swinburne's IoT lab to create real-life IoT solutions

Adding efficiency to the dairy industry

Have you ever considered the complicated journey a pint of milk has to make before you can buy it at your local store?

Consider this: Milk has to move from cow, to storage vat, to tanker truck; it has to take a drive to a factory where it goes into another vat. Then it has to be sterilized, cooked or fermented, packaged – and then it takes another trip to a retailer before it gets to you. Added to this, the milk has to enjoy tip-top conditions in storage and transportation units, to make sure bacteria or too-high temperatures don't spoil it faster, and high-quality milk has to be identified and separated in all these transport and processing stages.

From the minute milk comes from the cow it begins to spoil – it has only two days before it sours. In other words, its journey must be fast.

Bega Cheese chooses Swinburne

One of the largest dairy producers in Australia wanted to make its suppliers' milk journeys faster and safer. But how? It decided to investigate using the Internet of Things.

Bega Cheese, with its flagship cheeses and other iconic brands such as the world-famous Vegemite spread, saw that it was missing new opportunities in its supply chain. It wanted to make it faster, more efficient, more cost effective – and, at the same time, to reduce food waste.

Bega's Head of Supply Chain, Adel Salman, knew that the IoT could be an excellent solution. He could see the potential of using real-time data in the company's supply chain – both inbound and outbound. But he needed a partner – one with deep expertise in using IoT for agriculture and industry. One with excellent government connections and industry contacts.

He formed a committee that went around various universities in Australia to look for the ideal partner. And he found Swinburne University's Professor Dimitrios Georgakopoulos, Director of Swinburne's Internet of Things Lab – and the rest is history.

Georgakopoulos has deep insight into IoT, having started to innovate in IoT at Australia's national science research agency, the Commonwealth Scientific and Industrial Research Organization (CSIRO). At CSIRO he dove into smart farming, researching crop and plant behavior and the impact of environmental factors and fertilizer using real-time data from around 100,000 sensors.

At Swinburne, which Georgakopoulos joined in 2016 to start its IoT Lab, he got to experiment with several hundred commercial IoT sensors, sensor nodes, and other IoT devices. The university's IoT solutions have driven significant impact in the manufacturing, agriculture, retail, health and defence sectors in Australia and overseas.

Clearly, Swinburne had the prerequisites that Bega was looking for. Plus, Georgakopoulos heads the university's Industry 4.0 research program in the University's Manufacturing Futures Research Institute. He said: "We had a lot of experience on the production and factory side of the meat industry, which – as a \$16.5 bn export industry – has a lot in common with dairy," he said.

Swinburne did a lot of the heavy lifting to get the Bega Cheese project off the ground, which included a research grant from the federal government's Cooperative Research Centres Projects (CRC-P). Called the "Live Inbound Milk Supply Chain Monitoring and Logistics for Productivity and Competitiveness," it began late in 2019.

“Cumulocity IoT has the agility and scalability we needed for this project, giving us time to focus on building out the capabilities”

– **Dimitrios Georgakopoulos** | Director of Swinburne’s Internet of Things Lab



The project is in collaboration with Bega, Swinburne, Software AG, Optus and 100 Australian milk suppliers. Optus was chosen as partner to provide the narrowband data carriage for approximately 1000 sensor and related IoT devices that have been developed by Swinburne. They are currently being deployed in dairy farms and in trucks across Victoria. Then, what the project needed was an IoT platform for collecting this sensor data so it can be analyzed by the dynamic “pick-scheduling” and highly accurate milk-production forecasting applications developed by Swinburne. Together they provide the ability to start small and then scale to include Bega’s hundreds of farmers and suppliers.

That is where Software AG came in; to scale up the 2.5 year project with the use of its Cumulocity IoT platform. Georgakopoulos said: “Cumulocity IoT has the agility and scalability we needed for this project, giving us time to focus on building out the capabilities.”

Although progress was interrupted by the COVID-19 situation, Swinburne and Bega Cheese are now in the process of deploying sensors to three farms as the initial part of the project. They are fitting custom-made stainless steel enclosures to house sensors in vats; these monitor milk quantity, temperature and quality. Proximity sensors detect tanker truck arrivals and departures for dynamic scheduling. Sound and current transformers (CT) sensors monitor critical events in the milk pick-up process, and environmental sensors check for milk supply forecasting.

“This is the first effort of its kind in Australia where the IoT is focused on delivering a specific solution to the live inbound milk supply chain problems,” said Georgakopoulos.

Once the sensors are rolled out and the data starts to flow in, Bega will be able to leverage Cumulocity IoT to gather and analyze data for the program. Together, Software AG and Swinburne University are helping Bega to make milk’s journey a lot less perilous. And to get the freshest pint of milk to your store faster.

ABOUT SOFTWARE AG

Software AG began its journey in 1969, the year that technology helped put a man on the moon and the software industry was born. Today our infrastructure software makes a world of living connections possible. Every day, millions of lives around the world are connected by our technologies. A fluid flow of data fuels hybrid integration and the Industrial Internet of Things. By connecting applications on the ground and in cloud, businesses, governments and humanity can instantly see opportunities, make decisions and act immediately. Software AG connects the world to keep it living and thriving. For more information, visit www.softwareag.com.

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