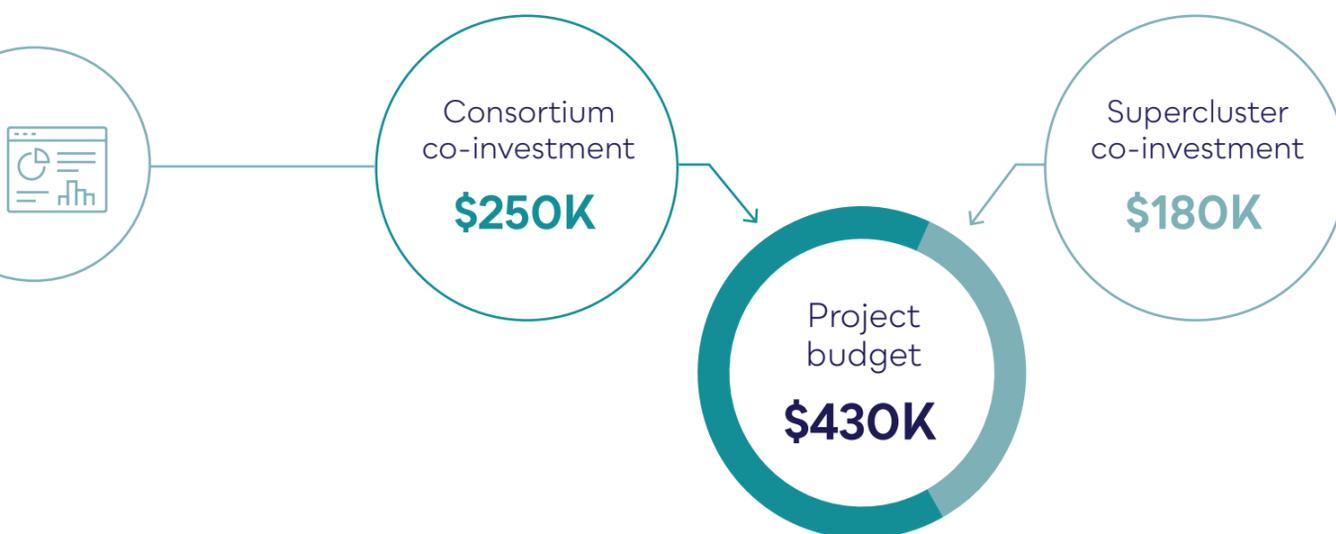




CANADA'S DIGITAL
TECHNOLOGY
SUPERCLUSTER

Predictive Analytics for Manufacturing Processes

The application of quantum computing to predict faults in the manufacturing process of advanced materials.



Project Overview

Avcorp Industries provides the world's leading aircraft manufacturers with supply chain solutions and repair support. Yield optimization, predictive maintenance, and equipment calibration are needs that are widespread throughout the manufacturing industry.

Complex manufacturing enterprises are a large and growing market for Software as a Service (SaaS) solutions with predictive capabilities. The development of applicable, tailored SaaS systems will reduce costly factory downtime, improve product yields and bottom-line performance.

The root cause of failures in product testing is often difficult to determine, particularly when the failure signals are sparse relative to the available background data. Compounding the problem, the process must meet a variety of specifications for multiple customers simultaneously.



This project aims to create a digital twin of the metal finishing line to leverage predictive analytics to analyze data (chemical, temperature, voltage) captured from the process line and provide new insights for an optimized manufacturing process.

Led by D-Wave, the world's leading supplier of commercial quantum computing systems, software and services, this research partnership includes Avcorp Industries, Solid State AI, and Simon Fraser University (SFU). In addition to leveraging the research capabilities in data analytics at Simon Fraser University, Solid State AI will use its unique predictive analytics tools and advanced machine learning techniques on the D-Wave 2000Q™ quantum computer to address situations when failure signals are sparse, relative to the available background data. These tools will move Avcorp's manufacturing fault detection processes from reactive to predictive-based.

This project will demonstrate predictive capabilities that can also be deployed in other manufacturing processes, including a wide array of typical industrial manufacturing and semiconductor fabrication plants.

The estimated market potential for these types of products is approximately \$5B over the next 10 years. Some studies suggest that predictive maintenance can enable the world's manufacturing industry to save up to \$700B USD over the next two decades. Success in this program will position Canada as a new challenger in the global predictive analytics field.

The project will also be a proof-of-concept for the much larger Learning Factory project, a single digital twinning platform that will digitize and optimize multiple processes at Avcorp's manufacturing facilities. If successful, this pilot could lead to further projects between the project partners for future supercluster applications. Other Canadian manufacturing enterprises working with the Digital Technologies Supercluster are also potential customers for the analytics solution.

