

Project Insights Report

Evaluating Opportunities and Challenges with Digital Twin Technology Adoption



PARTNERS

University of Victoria



LOCATIONS

British Columbia



INVESTMENT

\$54,315



PUBLISHED

August 2026



CONTRIBUTORS

Report author: Katie McLaren

Reviewers/approvers:
Anita Dubey, Laura McDonough

Executive Summary

As Canada advances into an era of digital transformation, emerging technologies such as digital twins have the potential to significantly impact the workforce. Digital twin platforms are an emerging technology that can integrate real-time data into dynamic, virtual representations of physical environments. They can support organizations to enhance data use, decision-making, and operational efficiency across sectors including agriculture, mining, forestry, utilities, and construction. Despite rapid global growth, digital twin adoption in Canada remains limited due to gaps in awareness, system-level knowledge, and workforce capacity.

This research from the University of Victoria examined the opportunities and challenges of digital twin adoption in key sectors in British Columbia. It used a mixed-methods approach, including semi-structured interviews with industry representatives and a survey of 143 professionals. While 60% of respondents were familiar with the term “digital twins,” only 11% had worked with these technologies. Importantly, many professionals reported using digital twin-related tools such as geographic information systems (GIS), sensors, drones, and data analytics.

This finding suggests that the primary barrier to their uptake is not technical skill, but rather their integration at a system-level across organizations. Other barriers to adoption include technology costs and limited organizational capacity for training. At the same time, there is strong demand for hands-on, experiential learning approaches, highlighting a misalignment between current training models and industry needs.

In response, the project team developed a five-stage training framework focused on collaboration, co-design, and continuous adaptation. This research underscores the fact that digital twin adoption requires coordinated action across education partners, industry, and policymakers. Strengthening training systems, investing in capacity, and fostering cross-sector partnerships will be essential to building a resilient, future-ready workforce.

KEY INSIGHTS

- 1 While 60% of professionals were familiar with the term “digital twins,” only 11% report working with digital twin technology in this survey.
- 2 Organizations face financial barriers, including equipment costs and limited organizational capacity, to support the adoption of digital twin technology.
- 3 To meet industry needs, digital twin training must be flexible, responsive and co-designed by education partners and industry leaders.

► The Issue

As Canada enters the era of digital transformation, emerging digital technologies and advances could have a major impact on the workforce. New technologies can support organizational data collection to enhance decision-making and optimize operations. A digital twin is a dynamic, virtual representation of a physical object, process, or system that uses real-time data to simulate behaviour, monitor performance, and predict future outcomes. It can support organizations in multiple sectors such as agriculture, mining, forestry, utilities, and construction.

Digital twins consist of four main components: the collection of data that can be rendered into 3D representations of real-world structures; the installation of Internet of Things (IoT) technologies, such as environmental sensors; the use of analytics based on machine learning and data mining algorithms; and the use of immersive visualization applications such as virtual or augmented reality. While digital twin technology is still evolving, it is growing at an accelerated rate. Digital twin technology is projected to grow from a \$17.7 billion to a \$259.3 billion global industry between 2024 and 2032.

Despite their promise, the adoption of digital twins remains uneven across Canada. There has been limited digital twin research to understand their uses and benefits to Canadian organizations. While many organizations are familiar with these technologies, there is a gap in their implementation due to a lack of knowledge of their benefits, access to training and workplace capacity. This gap is particularly evident in British Columbia, where sector leaders have expressed interest in digital twins but face barriers to implementation related to these issues.

Research could address this gap by evaluating the state of digital twin adoption, the development of flexible and responsive training models, and the design of scalable frameworks to support real-world applications in B.C and across Canada.



What We Investigated

This research project investigated the opportunities and challenges of adopting digital twin technologies in British Columbia in key sectors including mining, agriculture, construction, forestry, emergency response and data acquisitions. The project aimed to document current practices, barriers, and opportunities related to workforce training and technology integration for digital twins. Using these findings, the project team also sought to develop an industry-defined reskilling framework for digital twin adoption training.

Using a mixed-methods approach, the team conducted semi-structured interviews with representatives from five organizations and a survey of 143 professionals across sectors. This research was guided by three core questions:

1. What are the essential digital twin skills and competencies across sectors?
2. What barriers exist to training and adoption?
3. How can training programs be designed to be flexible, accessible, and aligned with industry needs?

What We're Learning

There is a gap between awareness and use of digital twin technology

While 60% of survey respondents indicated they had heard of the term “digital twins,” only 11% reported having worked with them. Among all sectors, those working in data acquisitions had the highest level of experience with digital twins. While the adoption and system-wide use of digital twins remains low, many indicated that they were familiar with individual tools or components associated with digital twins, such as geographic information system (GIS) platforms, drones, sensors, and data analytics. Some indicated they have been actively using these tools. This finding suggests that the gap in adopting digital twin technologies is not based on a lack of technical skills but more on the lack of their integration at a system level.

Despite high interest in adopting digital twin technology, organizations face implementation barriers

Equipment costs and training time were the top barriers to digital twin adoption, reported in the survey. To support their adoption, two elements are required: financial investment and increased organizational capacity to support knowledge transfer and training.

Flexible, skills-based training models are essential

Hands-on experience and practical skills are highly valued among organizations. Training programs should therefore prioritize experiential learning and task-based instruction to help workers adapt to evolving technologies. This finding has implications for post-secondary institutions, which may be misaligned with industry needs, as traditional academic models typically do not provide the necessary skills or experience to support training in digital twins.

A five-stage digital twin training action framework provides a roadmap for skill development across sectors

This framework is designed to support post-secondary institutions and training organizations to better align with industry needs. The five stages are:

1. Establish a network of engaged community learners, educators and industry partners to build a foundation.
2. Co-create digital twin training with industry partners who understand the real-world challenges of implementation and skills needs.
3. Launch the digital twin training platform that connects learners, educators and industry partners.
4. Adapt and expand the curriculum based on feedback from industry, government and technology providers to ensure the training is responsive to evolving technological changes.
5. Customize digital twin training for individual organizations and their specific needs.

This approach offers a roadmap for designing a responsive training to support the adoption of digital twins and to better meet sector needs.

Why It Matters

This project's findings reflect broader challenges in how workforce development systems respond to rapid technological change. Technology is reshaping jobs and accelerating the pace at which new skills are required. As a result, there is a growing need for more integrated, collaborative, and flexible approaches to skills development that can adapt to emerging technologies and evolving workforce demands.

A key implication is the need to align training curricula and programs with what employers value and need. Training programs must reskill workers and address emerging skills gaps. However, these models are often misaligned with industry needs and struggle to keep pace with technological changes. Embedding hands-on, experiential learning that enables individuals to develop practical, job-ready skills is needed.

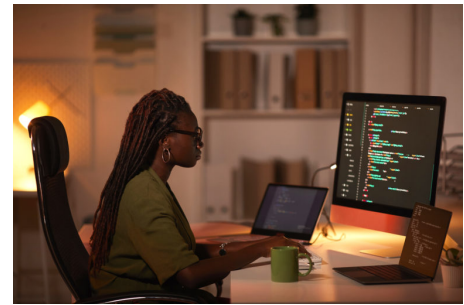
The findings also highlight the systemic barriers that limit the adoption of technology across sectors, regardless of interest or foundational skills. Challenges include cost and organizational capacity, particularly the time and resources required for training.

Ultimately, this project shows that the successful adoption of emerging technologies is not solely a technical issue but a systemic one. Bridging the gap between awareness and implementation will require alignment among education systems, industry practices, and policy frameworks. By prioritizing experiential learning, investing in organizational capacity, and fostering cross-sector collaboration, stakeholders can better position themselves to better adapt to emerging technologies and build a more resilient, future-ready workforce.

► What's Next

The University of Victoria is developing a Digital Twin Centre of Excellence in partnership with Ocean Networks Canada. The centre will deliver skills training on digital twins and associated technologies, and use the five-stage training framework to support training across sectors. Partnerships have been established with the First Nations Emergency Services Society and the BC Ministry of Lands, Water and Resource Stewardship to pilot the use of the framework.

Have questions about our work? Do you need access to a report in English or French? Please contact communications@fsc-ccf.ca.



State of Skills: Digital Tools in the Skills Ecosystem

There is considerable promise in the role digital tools and virtual career services can play in improving access to training and career development, particularly for those with geographic barriers or constraints such as family care or other work responsibilities.

[Read Thematic Report](#)

How to Cite This Report

McLaren, K. (2026). Project Insights Report: Evaluating Opportunities and Challenges with Digital Twin Technology Adoption, University of Victoria. Toronto: Future Skills Centre.
<https://fsc-ccf.ca/research/technology-adoption/>

Funded by the
Government of Canada's
Future Skills Program



Evaluating Opportunities and Challenges with Digital Twin Technology Adoption is funded by the Government of Canada's Future Skills Program. The opinions and interpretations in this publication are those of the author and do not necessarily reflect those of the Government of Canada.

The Future Skills Centre acknowledges that the Anishinaabe, Mississaugas and Haudenosaunee share a special relationship to the 'Dish With One Spoon Territory,' where our office is located, bound to share and protect the land. As a pan-Canadian initiative, FSC operates on the traditional territory of many Indigenous nations across Turtle Island, the name given to the North American continent by some Indigenous peoples. We are grateful for the opportunity to work in this territory and commit ourselves to learning about our shared history and doing our part towards reconciliation.

© Copyright 2026 – Future Skills Centre / Centre des Compétences futures