

Artificial Intelligence

How is it shaping the **future** of work and skills?

Learning & insights from
our innovation projects



Future Skills
Centre

Wouldn't it be better to track, in a more sophisticated way, mean or median satisfaction? Ms. Taylor said. By concentrating solely on those most enthusiastic about their rental experience, the company could focus on a key driver of profitable growth: customers who not only return to you again but also recommend Enterprise to their friends. Enterprise's approach surprised me, too. Most customer satisfaction surveys aren't very useful. They tend to be long and complicated, yielding low response rates and ambiguous implications that are difficult for operating managers to act on. Furthermore, they are largely challenged or audited because most senior executives, board members, and investors don't take them very seriously.

Many people think of having their own business as a dream. However, the reality is that it is a lot of hard work. You need to have a clear vision of what you want to achieve and a plan to get there. You also need to be prepared for the challenges that will come your way. It is not always easy, but it can be very rewarding. If you are serious about it, you will find a way to make it work.

Artificial Intelligence

How is it shaping the future of work and skills?

As Canada enters a phase of economic recovery from the COVID-19 crisis, the Future Skills Centre (FSC) is exploring the implications of AI in the workforce of today and tomorrow. This bulletin examines a set of projects specifically focused on AI, whether through their method of delivery or in their intended response to the ways in which AI is transforming the labour market.



Learning Questions

- How will AI affect jobs and who will be most impacted?
- To what extent will AI-related automation result in job displacement and what can we do about it?
- How can we boost digital adoption to benefit the Canadian workforce and grow our economy?
- How can we mitigate the risk of AI increasing bias and perpetuating inequalities?

AI, a paradigm shifting series of technologies, has brought a wide range of potential scenarios to the public imagination. In a best-case scenario, AI enhances human capabilities with minimal or no labour market displacement, perhaps even creating new and better jobs, all while driving improved economic efficiencies. In a worst-case scenario, AI algorithms might automate most or all human labour out of existence, leaving in its wake a socially dislocated society at the mercy of technocrats or even technology itself. In yet another hybrid-scenario, AI might indeed make human labour redundant, but instead of fracturing society, it gives individuals more leisure time and frees them to pursue more of their passions.

What is Artificial Intelligence (AI)?

- We use the term “AI” to refer to technologies that use new programming and software to identify patterns, produce insights, enhance knowledge-based work and automate routine tasks.
- AI’s capabilities and applications are changing rapidly, and they are quickly moving beyond the automation of routine tasks towards technologies that strive to mimic or surpass human capabilities.



“In a best-case scenario, AI enhances human capabilities with minimal or no labour market displacement.”

Yet for all these visions of a future potentially transformed by AI, it is impossible to know which scenario -- or any of them -- will actually play out. AI technology is evolving at an exponential pace, accelerating rapidly and eclipsing our ability to make sense of the changes. Behind AI's increasing speed of development lie enormous advances in digital processing power, facilitated by a broad sweeping technological shift from hardware to software (Wolfe, 2019). It's no wonder, then, that AI has conjured such colourful predictions about its potential impact on society, labour and the nature of work. But AI's potential should not be conflated with its impact; the former can be directed, and the latter is far from inevitable. Exponential growth means that even the foremost experts in AI can fail to predict what AI will or will not do. In the early 2000s, for example, driving a car was seen as outside the scope of automation, but is today becoming a reality (Norton, 2017).

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How are policymakers approaching AI?

- The Government of Canada has undertaken a variety of activities to position Canada for both the opportunities and risks that AI poses to our economy and society. In 2019, Canada developed its Digital Charter, which sets out action items to govern the digital economy. Budget 2021 makes it clear that these items are a growing priority, with investment in the Pan-Canadian AI Strategy quadrupling over 2017 levels, increased investment in the Strategic Innovation Fund, and a new Canada Digital Adoption Program announced to finance the adoption of new technologies among small and medium enterprises.
- The Government of Canada's Advisory Council on Artificial Intelligence was established in 2019, and plays an important role in counselling Canadian policy makers on issues critical to AI's impact on Canadian society. This year, the Council is exploring the expansion of Canada's talent base around AI and the impact of AI-enabled shifts on the workforce.
- In our current [Strategic Plan](#), the Future Skills Centre recognizes that automation and AI are among five key trends shaping current and future labour market trends. As a consequence, many projects within our portfolio aim to generate contextually relevant learning on AI and skills.

What we **are** certain about is that AI is now -- and will continue -- disrupting work as we know it. This disruption presents both significant risks and opportunities going into the future:

1. Even outside of the technology sector, there are opportunities to couple AI with human intelligence in new industries and growth areas, such as health care and financial services.
2. Automation poses a significant risk for Canadian workers; according to a [report](#) from the Diversity Institute and the C.D. Howe Institute (2020), about 40 percent of people work in jobs at medium risk of automation, while 22 percent are in jobs at high risk. The burden of automation is likely to be felt unevenly by different social groups. The proportion of Black and Indigenous people in Canada employed in jobs at high risk of automation is above the Canadian average (Wyonch, 2020).
3. In 2017, The Economist magazine famously referred to data as the “new oil” of the 21st Century. If data is the essential capital asset of a digitized economy, AI algorithms can be thought of as next-generation refineries that convert the data into insights and value-added products (Conference Board of Canada, 2020). The adoption of AI technology has the potential to yield substantial economic efficiencies, boosting Canada’s global competitiveness.
4. AI technology does not fall from the sky; it requires human input for its design, engineering, testing, manufacturing, installation, operation, maintenance and repair (Stanford, 2020). This will create new work that can potentially offset at least some of the job loss caused by automation.
5. AI’s major innovation lies in its ability to learn from and make decisions based on data input; but if data reflects biased assumptions about race, for example, AI can make “algorithmically biased” decisions that replicate inequalities. We have already seen startling examples of this through AI’s applications in technologies such as facial recognition. When AI models are built using only certain groups of people (i.e. white people, men, etc.), then the model is biased towards those groups in its very design. Conversely, there is also potential for responsibly designed AI to mitigate bias and support a more inclusive labour market. A well-designed AI model may mitigate the conscious and unconscious bias in human decision-making.
6. All of this creates a need to ensure we have the necessary skills across our social systems to both develop and use AI technologies in ways that align with our social values. But since technology develops faster than policy, we also need to ensure that policy makers have the skills and digital fluency to regulate, support and monitor AI effectively. FSC will continue to explore opportunities for developing AI skills amongst key regulatory and policy bodies in Canada.

What we are learning

Across this backdrop of critical context and a growing project portfolio, the Future Skills Centre is working closely with partners to reveal key learnings relevant for policy and practice. **Here are a few early lessons:**

1. AI will disrupt many industries, but its impact will be felt unevenly by different workers.

Both within and across sectors, the consequences of AI will be felt unevenly by workers depending on social factors, skill sets, levels of specialization and the task composition of their jobs. We know that AI-related automations are more likely to substitute for tasks that are manual, repetitive or “routine”. Given that jobs and roles involve different tasks, AI will undoubtedly replace tasks within jobs, but not necessarily whole jobs.

AI will not simply automate some jobs and ignore others. It will fundamentally alter the very nature of work and training in many professions. In recognition that AI’s impacts will be multidimensional, our research uses a variety of sectoral and population lenses. This allows us to inform a policy agenda that addresses both the generalized effects of AI and the targeted interventions needed for those likely to experience the most jolting digital transformations in their work.

Currently, FSC is exploring the different impacts of AI on workers and work within the health care, insurance and trucking industries, and the extent to which equipping workers with hybrid skill sets can help them more successfully navigate AI-driven transformations.



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Health care and AI

In the health care industry, the use of AI-enabled clinical decision-making and AI-simulated clinical reasoning systems has grown tremendously in recent years. American cardiologist Eric Topol predicts that “almost every type of clinician, ranging from specialty doctor to paramedic, will be using AI technology, and in particular deep learning in the future” (2019). Many of these AI systems function as tools that health care professionals can use to enhance their clinical judgment. Realizing the full benefits of AI for workers and patients alike will require effective engagement with health care workers themselves as they navigate these new tools.

Accordingly, FSC’s [AI in health care](#) project will culminate in the creation of a national certification program. This partnership with the Michener Institute and the Vector Institute will develop this program through knowledge gained by training 5,000 health care professionals in basic AI literacy and 180 in advanced AI skills. Currently, the project is developing a curriculum based on a needs assessment of health care professionals and AI education leaders. The training agenda focuses on various professions in the health care industry, recognizing that different roles will be transformed in different ways, depending on factors such as reliance on personal interactions, reliance on data, the number of repetitive tasks and the level of creativity required in daily practice. In professions like radiology and dermatology, for example, a larger share of tasks will be automated than in dentistry. We expect that practitioners equipped with at least a basic sense of AI literacy will not only be able to more effectively apply AI tools in their daily practice, but also to participate in shaping the future of their professions; for instance, by prioritizing use

cases for AI. Hybrid skill sets, leveraging some mix of AI, clinical and soft skills, will become increasingly valuable.

With this project, we are investing to learn what it takes to effectively upskill workers in the sector for the safe, effective and compassionate use of AI for different professions and tasks. We want to learn how training and retraining opportunities will enhance the ability of different health care professionals to adapt and shift their scope of practice in the face of technological change.

Insurance and AI

Profound digital transformation is also underway in the finance sector, and in particular, the insurance industry. The adoption of AI technologies has been growing exponentially in this field over the past few years, propelled by advances in machine learning, which can analyze and learn from data, identify patterns, and make decisions with minimal human intervention (Earnix, 2021). Given the insurance industry’s reliance on predictive risk analytics, many tasks performed by insurance professionals are ripe for automation by AI.

A [study](#) by Deloitte predicts that insurance underwriters, agents, actuaries and claims officers will work side-by-side with automating AI systems to drive new efficiencies, pointing to a need for those workers to develop hybrid skill sets. It is predicted that actuaries, for example, will perform more strategic planning tasks as AI automates some of their data analysis tasks. Other professional categories, however, are at risk of job restructuring and task automation; among them are insurance technicians, customer service representatives, administrative assistants, staffing

representatives and accountant technicians. The task composition of jobs is not the only factor that determines the level of automation risk; professional categories intersect with social factors such as gender.

Our action-research project in partnership with Université Laval, [Facing the challenge of digital transformation in the insurance sector: women at work](#), explores how to address the stratifying impacts of AI for women in the insurance industry. The study examines the Chaudière-Appalaches region in Quebec, which accounts for 11,000 of the 23,000 insurance jobs across Canada. In this region, women account for 65 per cent of the workforce but make up only 58 per cent of management positions in the insurance industry. Despite significant increases in education levels, women in Canada continue to be underrepresented in STEM (science, engineering, mathematics and computer sciences) programs in higher education. Some studies suggest that on average, men tend to have further developed technology skills than women in their fields. In an era of digital transformation, these factors may limit the ability of women to adapt to technological change in their careers.

In this project, Université Laval and Centre de développement en assurances et services financiers, a non-profit representing insurance companies located in the Québec and Chaudière-Appalaches area, are collecting data from workers in three partner insurance organizations. The researchers are also gathering data on task automation, drawing on job descriptions published in Canada and abroad. In combination, the data sets are being used to assess the nature and extent of digital transformation in positions filled by women with lower levels of education working in administrative or customer service positions where routine tasks can be automated, and are therefore most likely to be impacted by

technological changes introduced in their jobs. The research methodology will leverage the latest AI advances in Big Data, opening the door to data previously considered too complex to process and to new metrics for classifying employee skills. This project is advancing our understanding about the imbalanced impact of task automation on these two groups of women workers. With this understanding, a pilot training program will be developed to upskill, re-skill and/or outskill female participants identified as at risk, as well as a support program devoted to career development for them. We will assess the impact of the training for both workers and partner organizations, as well as its potential for replication in other industries.

Trucking and AI

The trucking industry is poised for transformation by automating technology in the future. At the same time, it currently faces an aging workforce and acute shortages of qualified professional drivers. The job vacancy rate in the trucking and logistics industry is the second highest among all Canadian industries, behind only crop production (Statistics Canada, 2021). And according to [Statistics Canada](#) (2019), 32 per cent of truck drivers are 55 years or older, while the same age cohort represents just 21 per cent of the overall Canadian labour force.

In an attempt to retain these workers, nearly half of employers are offering benefits like flexible work arrangements, reduced physical work, and better equipment (Trucking HR Canada, 2020).

But this does not address the whole problem. Many of these workers are either retiring or having doubts about whether they have the right skills to meet the changing demands of an industry in which autonomous vehicles are on the horizon. These concerns are also held by potential recruits who might fill the vacancies left by retiring workers, in addition to other issues such as work-life balance, safety and the overall image of the trucking industry. Recruiting women and younger workers has been particularly challenging for the industry. The nature of technological disruption in the trucking industry is thus twofold; automating technologies threaten to replace and/or re-structure human labour in the future, and anxiety about the future is causing both retention and recruitment challenges for the industry here and now.

In response to these challenges, our inaugural [Building the skills of the trucking industry](#) project, in partnership with the Atlantic Trucking Human Resource Sector Council, deploys an innovative virtual reality headset training with AI technology embedded for truckers. The simulator is the first of its kind specifically designed for the trucking industry, and can track the user's eyes and enhance driving skills through unlimited replays. The training not only develops truckers' essential driving skills but also prepares them for an increasingly automated and digitized work environment.

We are testing whether this training can improve the participants' job performance and job satisfaction, resulting in greater retention in the industry. This project also builds on findings from the SkillsNext series by FSC and its partner the Diversity Institute; namely, that AI can have powerful applications in providing instantaneous feedback on performance in areas where precision matters, and in skills mapping, particularly for organizations looking

to upskill and retain workers (Cukier, McCallum, Harrington & Patterson, 2020). To assess the effectiveness of this training approach, we are documenting skill assessments, survey and administrative data pre- and post-training. Early project data indicates strong participant and employer satisfaction with the program. We expect the emerging findings will support the recruitment of new people to the trucking sector with innovative teaching tools that support varied learning styles. With demonstration, employers may be encouraged to further adopt the technology and support its expansion. We will continue to share the learning and results as the project unfolds.

“AI can have powerful applications in providing instantaneous feedback on performance in areas where precision matters.”

2. AI-induced automation will result in some worker displacement, and those workers will need support to transition into new professions.

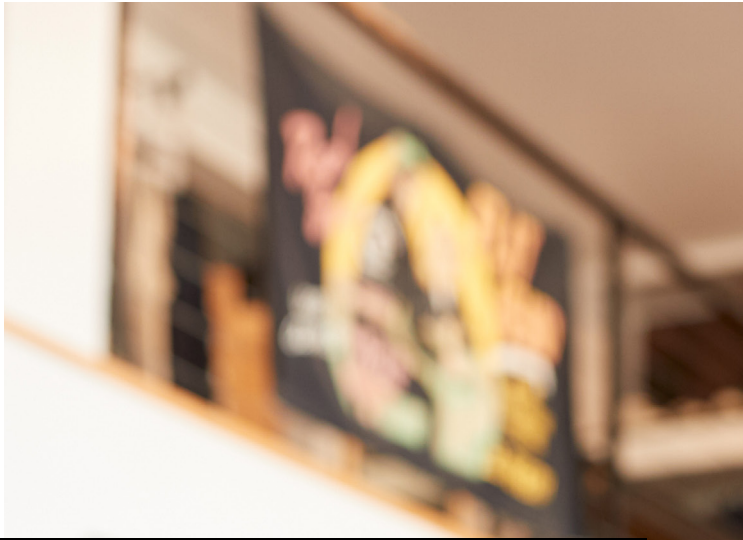
The adoption of automation tends to accelerate during recessions as employers seek leaner business models that minimize costs, particularly labour costs. This trend was seen in the 2008 recession, and a recent McKinsey (2020) [survey](#) of 800 executives worldwide found that half accelerated automation in their companies due to COVID-19. Despite the investment in automation, this does not uniformly spell job loss. A recent Statistics Canada (2020) [report](#), for instance, found that Canadian companies that invested in robots from 1996 to 2017 employ 15 per cent more workers relative to their industry average.

A closer examination reveals, however, that some workers in this period benefited more than others; employment expanded primarily for those in jobs either requiring a university degree or those requiring only a high school diploma or less. Workers in jobs that required vocational training or trades accreditation were more likely to lose their jobs and not be replaced after automation is implemented. The early signs of a “K-shaped” experience were evident even then, with workers in the upper leg of the K showing fewer challenges in retaining employment and the lower leg of the K demonstrating more vulnerability to labour reductions alongside automation.

While AI can indeed complement human labour in many instances, workers in some jobs, particularly those with highly-automatable task compositions, will undoubtedly face displacement. For those workers, upskilling to work with AI in their current professions will not be enough; they will need support and retraining to enter other professions.

FSC is working closely alongside several sectors where job displacement is being accelerated by the COVID-19 crisis. A 2020 [report](#) from the Conference Board of Canada identified retail among the top three industries with the highest concentration of jobs at risk of automation, with “few or no options to transition into lower-risk occupations without significant retraining.” In the first two quarters of 2020 alone, 1.3 million Canadian retail jobs were lost and technological disruption is likely to propel further displacement. Canadians are increasingly opting for online shopping, prompting retail businesses to adopt AI technologies that converge online and brick-and-mortar stores (Conference Board of Canada). Cashiers bear the highest level of risk, with self-checkout technology automating large shares of their tasks.

In recognition of these realities, FSC is currently working with front-line retail workers through our [Reskilling displaced retail workers](#) project, in partnership with Venture for Canada. Our investment in this 1.5 year project addresses an urgent gap in skilling and reskilling programming for displaced retail workers. With the project, we are prototyping an entrepreneurial skills training program with a systems change lens. The training aims to transition youth displaced from the retail industry into two new in-demand and high-paying career pathways: sales-adjacent or customer success employment at Canadian technology companies or IT/digital venture jobs with Canadian small and medium sized enterprises. The project focuses on two underserved groups of young people at elevated risk: racialized and Indigenous youth in retail. The project aims to uncover what it takes to cost-effectively reskill youth who face automation risk and systemic entry barriers into high-growth industries. Knowledge in this area will be critical for other industries with high concentrations of workers at risk of displacement, including accommodation and food services, manufacturing, construction, health care and social assistance. While automation may almost certainly appear in the future of all of these sectors, it may not be here yet, and employers who understand employee concerns and fears may be better positioned to navigate near-term labour shortages.



“Canadians are increasingly opting for online shopping, prompting retail businesses to adopt AI technologies that converge online and brick-and-mortar stores.”



3. Our current and future success in AI requires not just individual skills, but also shifts in organizational culture and practices.

For all of the potential efficiency gains and automation associated with AI, a climate of uncertainty often looms over the real impact of AI-associated transformation on jobs, workers and organizations. Fear and resistance to working with AI can slow the process of digital adoption across the economy, reducing Canada's global competitiveness. It is estimated, for example, that Canadian companies have spent approximately 40 per cent less per worker on technology than their US counterparts for the last few decades (Ticoll, 2020). If we are not to fall behind as adoption laggards, closing skill gaps is an important piece of the puzzle. However, fostering cultures of AI-adoption in organizations is equally important.

Organizational changes in the health care sector

A leading hypothesis of our [AI in health care](#) project is that organizational culture, rather than technology, is the biggest barrier for adopting AI technologies in health care. The phenomenon is captured by Martec's Law, which states that technology changes exponentially (very quickly) while organizations change logarithmically (much more slowly). If this discrepancy remains unaddressed, situations can emerge in which organizations are constantly playing catch-up with technological advancement. Consequently, workers are unclear about how AI will impact their jobs and are less likely to be invested in AI's success, viewing it more as a threat than an opportunity.

In health care, anxiety surrounding the adoption of AI systems stems not only from uncertainty about how AI will affect jobs, but also from concerns about patient care. Indeed, patient care constitutes the founding oath and driving mission of the health care workforce. Unlocking AI's full potential in health care begins with dispelling the notion that AI algorithms will replace health care workers in fulfilling their oaths to patient care; rather, AI will provide a suite of technical tools that practitioners can use to enhance their own clinical judgement, and ultimately drive better outcomes for patients.

One part of the solution being tested by the AI in health care project is upskilling training for health care workers to effectively engage with AI. Our expectation is that workers with AI-literacy-skills will be more likely to "buy in" to technological change, sparking more vibrant cultures of adoption. The project integrates an educational component into its delivery to change the mindset of health care workers alongside their skill sets. This means addressing uncertainties that practitioners have around how AI will impact different professions, how organizations are preparing for these shifts, and how to leverage AI to enhance patient care.

However, creating the sea change needed to fully harness the benefits of AI begins at the level of organizational leadership. Accordingly, the project educates health care leaders on AI and data-driven approaches for organizations. The mindset shift needed for organizations is as much about equity, data governance, transparency on AI usage, and change management as it is about technological progress. Leaders must be able to explicitly address the ways that technologies will be absorbed into the operations and culture of an organization.

One communication channel that is being tested through the project is a mentoring and coaching innovation hub. Participants from across Canada will be matched with leading experts to receive advice on integrating AI into their health care innovation projects. An education plan and a mentorship pathway will be developed for each mentor-mentee match with the goal of empowering health care professionals to drive AI-enabled change in their organizations. Ultimately, we expect these organizational shifts to boost the efficiency of digital adoption, and we will evaluate the spread and scale of technology innovation in addition to individual skill attainment; the hope is that the two will go hand in hand.

Industry 4.0

Traditional manufacturing and industrial practices across many sectors are being radically transformed by advanced industrial automation, or “Industry 4.0”. In sectors such as manufacturing, transportation, and health care, employers will increasingly demand digitally skilled labour as they deploy these smart technologies.

To accelerate the pace of digital adoption, our [Smart systems and digital technologies for a new era](#) project, in partnership with the W Booth School of Engineering Practice & Technology at McMaster University, is establishing a network between industry, municipalities and the university. McMaster engineering students will undertake work-integrated studies on several digital adoption projects on behalf of network partner organizations. To date, 58 projects have been secured, spanning a range of topics from 3D Printing and LoRaWAN for Smart Cities, to Digital Technologies for Health Care and the Use of Power BI Software for Data Analytics. On the supply side, network organizations

will have the opportunity to tap into a digitally skilled workforce to aid in their deployment of smart technologies.

On the demand side, McMaster will build technology adoption modules and prototypes in close collaboration with network organizations. To date, 10 Internet of Things (IoT) modules have been designed and are being tested, with more to follow. Over the span of the project, FSC will learn about the impact on the students and on the broader McMaster community through technology transfer. Similar to the approach the federal government has taken with the Digital and SCALE.AI Innovation Superclusters, we are exploring the potential of shared resource spaces in which organizations can rapidly adopt new technologies, while at the same time boosting digital skill development. We want to know if interventions like these can help boost digital adoption in ways that benefit the Canadian economy and workforce equally.

AI adoption across sectors -- Mid-career workers and leaders

It has been estimated that 90 per cent of the world’s data was generated in the last two years (Marr, 2018). AI technologies have demonstrated a breakthrough capacity to make sense of and extract insight from these massive amounts of data, offering an enormous value-add to business decision making processes. Accordingly, many large and medium-sized enterprises may be planning to invest in artificial intelligence in the near term for the purpose of increasing their productivity, enhancing the customer experience or reducing operating costs. But across many businesses, the ability to leverage AI is limited by a lack of comfort and familiarity with AI technology.

4. AI can foster greater inclusion in the job market.

What has made AI so revolutionary is that it actively learns to make decisions based on the data that flows into the model. At the outset of this technology, early tech pioneers thought this quality might allow us to bypass human biases. But if data reflects social biases, AI systems can learn to make “algorithmically biased” decisions. We have seen many examples of this with police and border crossing facial recognition software, with some algorithms yielding error rates 10 or even 100 times higher for Black women than for white men (Israel, 2020). We recognize that without a fair and accountable design process, bias can be replicated within AI algorithms and perpetuate -- and further obscure -- inequalities. That’s why we are experimenting with purposefully designed AI systems to mitigate bias in the job market.

We are excited to see how this plays out in our [Connecting youth to jobs with AI](#) project with Civic Action and Accenture. The project leverages AI in a job posting and assessment tool to address systemic barriers in the first step of hiring -- the job posting. Using natural language processing (NLP), the assessment screens job postings for non-inclusive language such as “points of service”, or “manpower” and flags arbitrary job requirements. The platform then makes automated recommendations to employers about their posting(s) to better attract young, diverse talent. Early user testing results indicate positive feedback; among the users who received recommendations, 100 per cent reported that the Job Posting Assessment’s recommendations were organized, easy to comprehend, relatable, and implementable. Over the next two years, FSC will be watching closely to see whether this tool creates more equitable outcomes for youth job seekers.

As AI technology rapidly evolves, FSC and other evidence-oriented actors in the ecosystem can play an active role in driving better outcomes for workers not just by responding to AI, but by designing and applying it responsibly.

“Across many businesses, the ability to leverage AI is limited by a lack of comfort and familiarity with AI technology.”

Learning themes	Relevant projects
AI-related disruptions to diverse groups of workers	Facing the challenge of digital transformation in the insurance sector: women at work – Laval University • In close collaboration with major industry partners in Quebec’s Chaudière-Appalaches, the epicentre of the Canadian insurance industry, this project explores the stratifying impacts of automation in the insurance industry on women, and prototypes a training model to upskill, reskill and/or outskill those at greatest risk.
	Building the skills of the trucking industry - Trucking Human Resource Sector Council Atlantic • This project delivers upskilling training to drivers through a Virtual Reality headset with embedded AI technology to support workers’ retention in an increasingly automated industry.
	AI in health care - Michener Institute, Vector Institute and University Health Network • This project aims to shift the mindset, skill set and toolkit of health care professionals, supporting their ability to apply AI tools in their practice
AI-supportive organizational culture and practices	Smart systems and digital technologies for a new era - McMaster University • A network of municipal, industry and university organizations is developing digital adoption resources and offering work-integrated learning opportunities to engineering students at McMaster University.
	From data to decision: AI training and professional certification – University of Montreal & IVADO • A short-duration, online training program for mid-career professionals and leaders on how to integrate AI into organizations.
Transition support for displaced workers	Reskilling displaced retail workers - Venture for Canada • This project supports the retraining of racialized and Indigenous youth retail workers displaced by automation and COVID-19 into tech-related fields.
AI for inclusion	Connecting youth to jobs with AI - CivicAction • This AI-powered job posting tool offers automated recommendations to employers to make their postings more inclusive and accessible.

What's next?

As technology continues to develop exponentially, FSC is excited to collaborate with its innovation partners to keep a finger on the pulse of the work world. We are committed to building our understanding of the divergent implementations of automation as they occur for different workers and various types of work. Technological disruption is moving faster than ever, and responding to the challenges ahead will require continued engagement with industry, employers, training providers, and perhaps most of all, workers. To that end, FSC is committed to collaborating with partners to design and implement robust learning and evidence generation plans, in order to share what works, for whom, and under what conditions. We will continue to share these lessons, as we learn them, for ongoing dialogue and application to policy and programs.

“Technological disruption is moving faster than ever, and responding to the challenges ahead will require engagement with industry, employers, training providers, and most of all, workers.”



References

- Cukier, W., Harrington, S., Patterson, M., & McCallum, K. E. (2020, November 3). SkillsNext: Technology-Enabled Innovations in the Skills and Employment Ecosystem (Rep.). Retrieved from <https://fsc-ccf.ca/research/technology-enabled-innovations-in-the-skills-and-employment-ecosystem/>
- Gresch, D. (2020, May 28). Responding to Automation: How adaptable is Canada's labour market? (Issue brief). Retrieved from <https://www.conferenceboard.ca/e-library/abstract.aspx?did=10626>
- Israel, T. (2020, November 9). Facial recognition is transforming our borders, and we are not prepared [Web log post]. Retrieved from <https://policyoptions.irpp.org/magazines/november-2020/facial-recognition-is-transforming-our-borders-and-we-are-not-prepared/>
- Marr, B. (2018, May 21). How Much Data Do We Create Every Day? The Mind-Blowing Stats Everyone Should Read. Forbes. Retrieved from <https://www.forbes.com/sites/bernardmarr/2018/05/21/how-much-data-do-we-create-every-day-the-mind-blowing-stats-everyone-should-read/?sh=66be84a360ba>
- Martane, V. (2021, February 18). 10 best free online Responsible AI courses in 2021. Retrieved from <https://thegoodai.co/2021/02/18/10-best-free-online-responsible-ai-courses-in-2021/>
- Nadeau, A., & Nasser, R. (2020, October 29). Artificial intelligence will underpin Canadian innovation and global competitiveness. Retrieved from <https://www.conferenceboard.ca/insights/featured/innovation-technology/artificial-intelligence-will-underpin-canadian-innovation-and-global-competitiveness>
- Norton, A. (2017). Automation and inequality: The changing world of work in the global South. IIED. Retrieved from <https://pubs.iied.org/11506iied>
- Ouellet-Léveillé, B., & Milan, A. (2019, July 25). Results from the 2016 Census: Occupations with older workers (Rep.). Retrieved from <https://www150.statcan.gc.ca/n1/pub/75-006-x/2019001/article/00011-eng.htm>
- Stanford, J. (2020, January). SkillsNext: Thinking Twice About Technology and the Future of Work (Rep.). Retrieved from <https://fsc-ccf.ca/wp-content/uploads/2020/01/ThinkingTwiceAboutTechnology-SkillsNext-JAN2020-EN.pdf>
- Statistics Canada. Table 14-10-0326-02 Job vacancies, payroll employees, job vacancy rate, and average offered hourly wage by industry sub-sector, quarterly, unadjusted for seasonality (Data table). Retrieved from <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410032602>
- Study: The Employment Consequences of Robots: Firm-level Evidence (Rep.). (2020, November 02). Retrieved from <https://www150.statcan.gc.ca/n1/daily-quotidien/201102/dq201102d-eng.htm>
- The Age of With: Accelerating the impact of augmented intelligence in insurance (Rep.). (n.d.). Retrieved from <https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/deloitte-analytics/ca-en-age-of-with-insurance-aoda.pdf>

The Road Ahead: Addressing Canada's Trucking and Logistics Industry Labour Shortages (Rep.). (2020, March). Retrieved from https://truckinghr.com/wp-content/uploads/2020/03/THRC-Labour-Market-Information-Report_English-version.pdf

Ticoll, D. (June 20). Skilling Canadians for Leadership in the AI Economy (Rep.). Retrieved from <https://technationcanada.ca/wp-content/uploads/2020/10/Skilling-Canadians-FINAL-online.pdf>

Topol, E. J. (2019). High-performance medicine: The convergence of human and artificial intelligence. Nature Medicine, 25(1), 44-56. <https://pubmed.ncbi.nlm.nih.gov/30617339/>

What 800 executives envision for the postpandemic workforce. (2020). McKinsey Global Institute. Retrieved from <https://www.mckinsey.com/featured-insights/future-of-work/what-800-executives-envision-for-the-postpandemic-workforce#>

Wolfe, D. (2019). A Digital Strategy for Canada: The Current Challenge. IRPP (Policy Options). Retrieved from <https://irpp.org/wp-content/uploads/2019/01/A-Digital-Strategy-for-Canada.pdf>

Wyonch, R. (2020). The Next Wave: Automation and Canada's Labour Market. C.D. Howe Institute. Retrieved from <https://fsc-ccf.ca/research/the-next-wave-automation-and-canadas-labour-market/>

Ziv, U. (2021, January 25). How AI is Transforming the Insurance Industry. Retrieved from <https://earnix.com/newsroom/in-the-news/how-ai-is-transforming-the-insurance-industry/>

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