PROJECT INSIGHTS REPORT

The skills algorithm: Digital skills demand across Canada's labour market

Digital Skills & Technology

EXECUTIVE SUMMARY

During the COVID-19 pandemic, the use of digital skills and platforms enabled a major shift towards remote work. This rapid change required many industries and workers to adapt to new technological tools and concepts even as digitization had been trending upward before the pandemic.

This project used machine-learning methods and data from nine million Canadian job postings collected from January 2020 to June 2023 to understand how demand for digital skills has changed since the pandemic and the importance of non-technical or soft skills even in digital workplaces and occupations.

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PARTNERS

The Dais

LOCATIONS

Pan-Canadian

INVESTMENT

$494,000.00

The project found that the most in-demand digital skills continue to be for general workforce tasks – low-intensity digital skills that are relevant regardless of sector or industry. With the rise of AI in the last year, demand for artificial intelligence skills is growing, but overall higher digital intensity skills saw less change in demand over the course of the pandemic. There was also significant growth in demand for non-digital health, safety, and environmental skills, reflecting the widespread impact of health protocols. The project also showed that employers are still seeking hybrid (digital and non-digital) skills – most often general workforce digital skills paired with teamwork, communication skills, and time management.

Training providers and decision makers should integrate the findings of this analysis into their programming decisions – ensuring that the cultivation of general workforce digital skills is not lost, as these are the skills most sought out by employers across a range of sectors and industries.

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KEY INSIGHT #1

31% of all digital skills identified were low digital intensity skills used by workers across all occupations and industries. For example, Microsoft Suite skills are mentioned over four million times.

KEY INSIGHT #2

Digital skills pertaining to Microsoft Suite programs commonly appear alongside non-digital, social emotional skills like communication and teamwork, and more general occupational skills like customer service.

KEY INSIGHT #3

The proportion of job postings requiring AI skills grew from approximately 0.6% in early 2023 to 1.7% in September 2023.
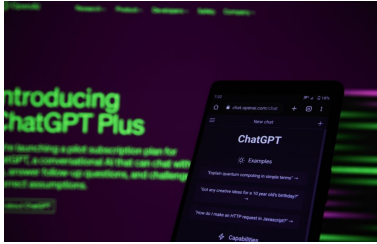
The Issue

While digitization of the economy and technological adoption by all manner of organizations have been long-term transformational trends, the COVID-19 pandemic prompted a major acceleration for large segments of the labour force. Workers rapidly shifted to remote arrangements, spending their days on digital video-conferencing platforms like Zoom and Microsoft Teams for meetings, and collaboration tools such as Slack and Trello for planning and managing tasks. This placed an increasing onus on workers to possess increasing levels of digital literacy and skills for all workplaces. But the implementation of remote work settings varied across sectors and occupations and for professionals in technology-oriented occupations, the advancement of technologies such as artificial intelligence continues to drive a similar need for more digitally-intensive skills.

What We're Investigating

This project explored the evolution of skills during the pandemic, including the emergence of new digital skills trends, and the interaction of different types of skills, and compares these findings with the findings from previous work, I, Human.

The research questions guiding this project were:

- In what ways has the digital skills profile of the average worker changed during the pandemic?
- Which prominent new digital skills have emerged during this time?
- Which digital skills have and are likely to continue to remain prevalent?

The project used machine-learning methods and data from nine million job postings collected, Canada-wide, from January 2020 to June 2023, to classify skills into clusters to analyze the nature of digital skills over the course of the pandemic, and to identify trends in digital skills that have emerged. The project also analyzed the interaction between digital and non-digital skills providing insight on the importance of non-technical or soft skills even in digital workplaces and occupations.

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What We're Learning

Of the total skills listed, the proportion of digital skills listed by employers in job postings actually fell during the pandemic, from 20% in 2019 to 17.5% in 2021 and 14.8% in 2023. However, this overall trend disguises the growth in more specific digital skills, including e-charting software in health care, and general workforce skills associated with remote work.

The most in-demand digital skills were for general workforce tasks. Consistent with 2019, the most common digital skill in demand is Microsoft Office Suite (Excel, Word, Access) by a vast margin, found in over 20% of job postings. General workforce digital skills appear in job postings at over twice the rate of software, product development, or data skills – the second most prevalent type of digital skills behind workforce digital skills. There was growth in demand for new general workforce digital skills, such as video conferencing platforms, instant messaging software (e.g., WhatsApp) and online meeting and video conferencing software (e.g., Zoom, Google Meet, Microsoft Teams and Cisco WebEx). For example, the number of occurrences in job postings for video conferencing software skills more than doubled from 2019 (109 percent), and instant messaging software grew even faster (by 166 percent, albeit from a low baseline in 2019).

Demand for artificial intelligence skills is growing, but overall higher digital intensity skills saw less change in demand. While there was little change in demand across most high-intensity digital skills, the proportion of job postings requiring AI skills grew from approximately 0.6% in early 2023 to 1.7% in September 2023. Another exception was increased demand for digital skills with higher concentrations in the tech industry such as coding skills in C++ and C#. This likely reflects the growing prevalence of research and development of generative AI products (e.g., Large Language Models such as Google's PaLM 2 and OpenAI's ChatGPT, image generators such as Midjourney and DALL-E, etc).

There was also significant growth in demand for non-digital health, safety, and environmental skills. This includes the use of protective gear such as gloves and face masks/shields, first aid and Occupational Health and Safety Act standards. This presumably reflects pandemic-induced growth in demand for these skills across all workplaces, as well as heightened demand for essential workers in health care and other industries.

Employers are still seeking hybrid (digital and non-digital) skills.

A number of these hybrid skills — teamwork, communication, interpersonal and leadership skills — are widely in demand across all or most of the digital skills sub-clusters that were explored, though they vary depending on the specific occupational profile. The most frequently appearing hybrid skill pairs are non-digital skills from Sales and Merchandising co-occurring with digital skills from the General Office-based Skills cluster, which co-occur over 20 million times in the dataset. Digital skills in the General Office-based skills cluster include Microsoft Suite tools, accounting software, and Intuit QuickBooks, which are prominently used across office work settings to organize and manage projects and finances. Non-digital skills in Sales and Merchandising include skills such as teamwork, communication skills, and time management, all of which are crucial to managing interpersonal relationships. The pandemic also gave rise to a higher demand in strong communications skills when workers had to adapt to a changing work environment and companies had to speed up their digital transformation to facilitate this transition.

Why It Matters

There has been a lot of focus on the need to develop digital skills for today's economy, prioritizing education and training in the STEM disciplines. And while these remain important to continue to cultivate as these skills will continue to be in demand, many employers are seeking workers with a blend of low-intensity digital and nondigital skills— notably universally relevant skills like teamwork, communication, leadership, and project management.

In addition to this, 58.1% of job vacancies in the 2nd quarter of 2023 in Canada required a high school diploma or less – a large majority of these jobs will require the general workforce digital skills laid out in this report.

While not abandoning efforts to foster advanced digital skills, education and training providers, governments, employers and industry intermediaries should also be seeking to cultivate both general workforce digital skills alongside non-digital skills like teamwork, communication, leadership, and project management. These basic hybrid skills are in demand and will continue to be relevant for the majority of available jobs going forward.

What's Next

The overall FSC-funded research project and partnership with The Dais, "Jobs, Skills and Technology Change", seeks to understand how jobs and skills across Canada are being impacted by technological change, such as automation and digital augmentation, to help companies and people gain the skills they need to adapt and thrive in an increasingly innovation-driven economy. This report is one of four in this series:

- Race Alongside the Machines: Occupational Digitalization Trends in Canada, 2006-2021

- Mind the Gap: Compensation Disparity Between Canadian and American Technology Workers

- Built to Scale: Assessing Microcredentials for Digital Sector Professionals