ChatGPT

Organizational and Labour Implications

The Future Skills Centre – Centre des Compétences futures (FSC-CCF) is a forward-thinking centre for research and collaboration dedicated to preparing Canadians for employment success. We believe Canadians should feel confident about the skills they have to succeed in a changing workforce. As a pan-Canadian community, we are collaborating to rigorously identify, test, measure, and share innovative approaches to assessing and developing the skills Canadians need to thrive in the days and years ahead.

The Future Skills Centre was founded by a consortium whose members are Toronto Metropolitan University, Blueprint, and The Conference Board of Canada.

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Key findings

- Generative AI tools like ChatGPT have the most potential to impact roles requiring writing and programming skills.

- The need for writing skills is much more widespread than programming skills, with two-thirds of jobs in Canada requiring writing skills at a moderate or higher level of importance. This means that writing is where generative AI is likely to have the largest organizational implications.

- It is uncommon for a single role to need both writing and programming skills at a high level, but this is the case for some STEM professionals and knowledge workers. These are the people whose roles are most susceptible to the effects of tools like ChatGPT.

- The most likely use cases for generative AI tools involve conducting simple activities or assisting with more complex ones. Making effective use of the tools still requires knowledge and judgment, meaning that they are likely to support rather than replace people in different roles.

- The potential gains in productivity from generative AI models are significant. One study found that people in certain roles with access to ChatGPT worked 40.0 per cent faster and the quality of their work increased by 18.0 per cent.

- If generative AI tools can address shortages in critical technology skills by making people in those roles more efficient, businesses may be better able and willing to make productivity enhancing investments. This could lead to broader economic growth.

- Businesses need to develop appropriate use policies and use cases, as well as monitor regulatory developments. This will allow them to benefit from the potential of generative AI applications, while reducing the competitive and security risks that these tools may bring.

Introduction

Artificial intelligence (AI) has a long history, with the first AI program often attributed as the "Logic Theorist," created in 1956.[1] More recently, advancements in machine learning algorithms, and the growing availability of large data sets on which to train models, have led to a proliferation of AI applications. However, in November 2022, the release of ChatGPT (Chat Generative Pre-trained Transformer) by OpenAI marked a turning point in public interest.
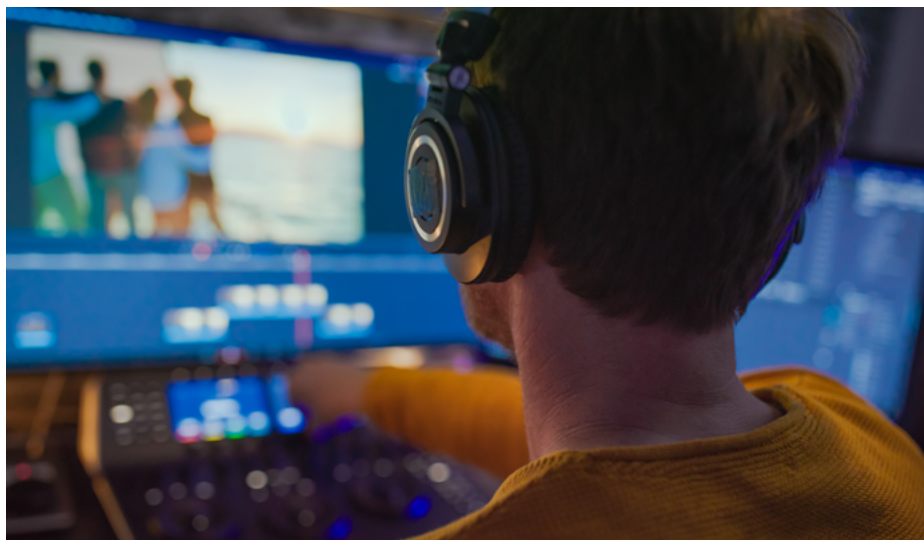
ChatGPT reached 100 million users within two months of its launch, faster than any other consumer application.[2] By way of comparison, it took TikTok nine months, and Instagram two-and-a-half years to reach the same milestone. Usage of the site appears to have reached a tableau at about 1.5 billion visits per month, which is still sufficient to put it among the 25 most-visited sites on the web.[3] Perhaps one of the reasons for the popularity of this application is that it is so easy to use. Because it is based on a large language model (LLM), communicating with the interface requires only basic writing skills.

ChatGPT is a text-based example of generative AI applications, which can create new data by learning from patterns in existing data. Other generative AI examples include DALL·E 2 or MidJourney for image creation, and Pictory or DeepBrain AI for speech and video creation.

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1   Crevier, *AI: The Tumultuous Search for Artificial Intelligence.*
2   Hu, "ChatGPT Sets Record for Fastest-Growing User Base."
3   similarweb, "Top Websites July 2023."

The potential for these applications to disrupt how we create and communicate ideas is profound. It is also disturbing. For example, many prominent technology leaders published an open letter calling for a moratorium on further development of AI systems more powerful than the model used in ChatGPT.[4] Ultimately, to ensure AI's safe and appropriate use, there is an urgent need to develop appropriate governance and regulatory frameworks. OpenAI itself has announced that up to one-fifth of its processing capacity over the next four years will be dedicated to creating an automated system that aligns AI systems with human ethics.[5]

Wherever AI development next takes us, the genie is out of the bottle: AI will have implications for the future of work. Given the quickly multiplying number of AI tools that are available, and surging interest in how they can be used, cataloguing all the ideas being assessed would be an enormous challenge. Examples include tasks normally undertaken by order takers,[6] customer service agents,[7] and the creators of marketing videos.[8] However, given the popularity of ChatGPT, we will focus on the potential implications of that or similar tools.

Much of our research related to the labour impacts of automation has been focused on identifying which roles we believe are at highest risk,[9] and how we can help people in those roles transition into different roles.[10] Tools like ChatGPT will have implications for a hugely different group of workers.

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4   Future of Life Institute, "Pause Giant AI Experiments."

5   Trueman, "OpenAI Launches New Alignment Division."

6   Roth, "Wendy's Tests an AI Chatbot That Takes Your Drive-Thru Order."

7   Castaldo and Silcoff, "Toronto Company Ada Support Using AI."

8   Savage, "Why AI Is Poised to Disrupt Video Marketing."

9   Gresch, *Responding to Automation*.

10 Conference Board of Canada, The. *Digital Occupation Pathways*.

ChatGPT has the largest implications for roles using writing and programming skills

By assessing the types of tasks that applications like ChatGPT can be used to support or complete, we can better understand how they will impact the way we work. These include activities like editing, writing, translation, code generation, data analysis, and classification. As a result, a recent study found that the roles most likely to be impacted were those where the importance of writing and programming skills are high. [11] Conversely, roles that place an elevated level of importance on science and critical thinking skills were least impacted.

Using The Conference Board of Canada's Opportunext database, which applies a skills framework to Canadian labour data, we can estimate what these findings mean for the Canadian labour market.[12] In particular, we can look at how important programming and writing skills are for nearly 500 different roles in Canada and estimate the scale of the potential impact.

The need for writing skills is far more widely spread than programming skills, with all jobs requiring at least a low level of writing skills. In fact, nearly two-thirds of the Canadian workforce are currently in roles that require writing skills at a moderate or higher level of importance. In comparison, nearly one-fifth of roles do not require programming skills at all. Among those that do, only six occupations, accounting for about 2 per cent of employment, require programming skills at a moderate or higher level of importance. This means that the scale of the workforce implications for each of these skills is quite different.

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11   Eloundou, Manning, Mishkin, and Rock, "GPTs Are GPTs."

12   Gabler, Rao, and Hindle, *A Path Forward*.

Given the widespread need for and application of writing skills, this is where the impact of LLM's have the largest potential impact. Nearly all organizations can use tools like ChatGPT to support a range of writing-related tasks including:

• writing correspondence, such as emails or memos;

• simple translating needs;

• proofreading, including correcting grammatical and spelling errors;

• simplifying writing to make it accessible for a broader audience;

• simple content creation for websites or social media.

Generative AI tools are less well suited to the creation of new and novel ideas that are inherent in more complex writing tasks, such as creative writing. Despite this current limitation, concerns around the use of AI is a critical issue in the 2023 Hollywood strikes.[13]

These tools can be used to support complex writing tasks, such as how to structure an idea or to help a writer get past a creative block. However, there are limitations on their usefulness, such as repetitive and overly simplistic language, dated source material, and a lack of originality or nuance. These tools also have the potential to introduce unintentional bias, such as political leanings, into content.[14] As a result, in their current form, tools like ChatGPT are more likely to support rather than replace people who are in roles that require complex writing skills. However, the tasks that people in these roles undertake may change to become more focused on the complex activities.

As the mix of tasks in roles change, demand may shrink, as AI support makes people more efficient. However, it is also possible that additional tasks will be added, as the affected roles gradually change to become something more or new. In theory, the roles that would most likely be at risk of shrinking demand would be those where writing is important, but the skill required is low. In practice, the need for a skill and the level required in a particular role are highly correlated. For example, none of the top 50 roles where writing is important have a below-average writing skill requirement.

The most likely outcome for roles that require programming skills is similar to those for writing. Namely, generative AI can support programming activities like debugging, suggesting algorithmic approaches, and generating simple or repetitive code. However, making effective use of these suggestions will require knowledge and judgement. People who blindly implement code written by these tools may unknowingly incorporate errors or biases into their work.

The organizational implications of increased use of generative AI in programming skills are likely to be much more focused than for writing skills. Businesses that make heavy use of programming skills – such as information technology, financial services, and telecommunications – are where there is the greatest potential impact.

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13 Dalton, "AI Is the Wild Card in Hollywood's Strikes."
14 Heikkila, "AI Language Models Are Rife With Different Political Biases."

STEM and knowledge workers are likely to be the most impacted

The importance of writing and programming skills are generally not linked within specific roles. In fact, most roles where writing skills are incredibly important – such as writers, editors, journalists, and managers – require minimal levels of programming skills. (See Table 1.) Conversely, many roles where programming skills are especially important – such as computer programmers, web developers, software engineers, and data analysts – require a moderate or lower level of writing skills. However, there are some notable exceptions.

Among the 25 roles where programming skills are most important, 12 are also among the occupations ranked in the top quartile for writing importance. These include many engineering roles, post-secondary teachers and researchers, and information systems managers and technicians. (See Chart 1.) These are the roles where generative AI is most likely to have the largest impact on day-to-day tasks.

Table 1
Top 10 roles where writing or programming skills are most important

Programming	Writing
Computer programmers	Writers
Web designers and developers	Specialist physicians
Information systems technicians	Editors
Database analysts and administrators	Biologists
Computer network technicians	School principals and administrators
Software engineers and designers	Education policy researchers
Physicists and astronomers	Journalists
Psychologists	Family physicians
Information systems managers	Judges
Machining tool operators	Pharmacists

Source: The Conference Board of Canada.

Chart 1
ChatGPT has potentially the biggest impact on 12 occupations
(skill importance scale 0–100)
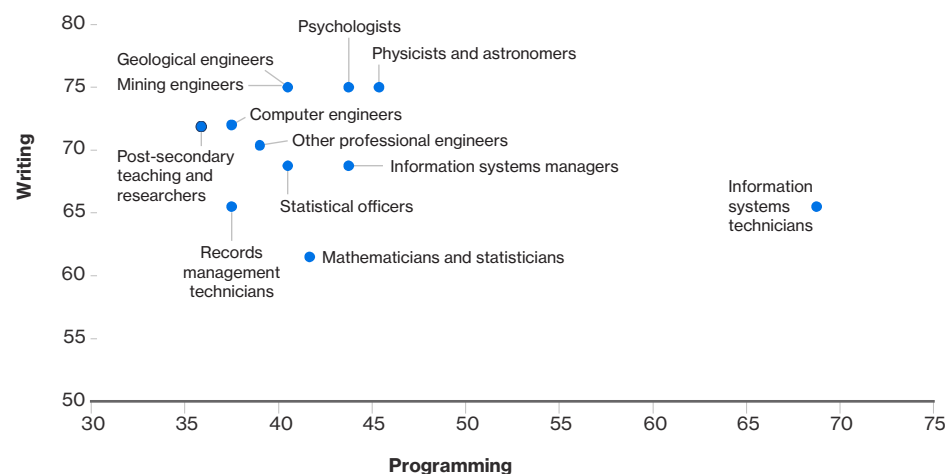
Source: The Conference Board of Canada.

Interestingly, all of these roles fall into either the STEM (science, technology, engineering, and math) professionals or into the knowledge workers clusters that we have previously identified as having the lowest automation risk and tightest labour market.[15] Even if we broaden the constraints to include the top 50 roles where programming is most important and are still in the top quartile for writing importance, we continue to see that nearly all of the workers who are most likely to be impacted by the widespread use of generative AI tools fall into these two clusters.

None of these roles employ a particularly large number of people, accounting for a combined 4.0 per cent of employment using the broader definition. Thus, tools like ChatGPT are unlikely to cause major changes in employment levels. They do, however, have the potential to drive significant improvements in labour productivity. For example, a recent study provided marketers, grant writers, consultants, data analysts, and human resource professionals access to ChatGPT. The study results showed that the respondents worked 40.0 per cent faster, and the quality of their work increased by 18.0 per cent.[16]

Furthermore, there is the potential that productivity improvements for knowledge and STEM workers may have broader economic implications. Labour and skill constraints are common reasons cited as obstacles to technology adoption in Canada.[17,18] In turn, the slow pace of technology adoption is a contributing reason for Canada's extended period of weak labour productivity growth. In short, if generative AI tools are able to fill in some gaps in critical technology skills, businesses may be more willing to make productivity enhancing investments that will speed up technology adoption.

However, for these productivity improvements to materialize, other factors may also need to be addressed. These include increasing competition and overcoming another common barrier to technology adoption – namely people's resistance to change. Regulatory barriers may also be a factor given that several of the industries most likely to be impacted by generative AI models are also heavily regulated, such as banking and telecommunications.[19]

15   Gabler, *Beyond Blue and White Collar.*
16   Noy and Zhang, "Experimental Evidence on the Productivity Effects."

17   Statistics Canada, *Survey of Advanced Technology.*
18   Carpenter and Sonmez, *Surveying Automation Trends in Canada.*
19   *The Economist*, "Your Job Is (Probably) Safe From Artificial Intelligence."

Organizational implications

Given the potential rewards and risks that come from using generative AI models, as well as the fast pace of adoption, there are several things that organizational leaders need to consider.

Your people are likely using AI tools already

The entry level version of ChatGPT is free to use and does not require the installation of any software on a user's computer. This means that people can easily avoid, and may not even consider, any internal software approval processes before they start using the tool for business purposes. Indeed, a survey found that 28.0 per cent of U.S. workers are already using ChatGPT at work, even when their employers had explicitly banned its use in some cases.[20]

For employers who are intent on enforcing bans, restrictions on access to the ChatGPT website will likely be required. Employers will also need to identify and ban other similar tools, such as Google's Bard, and Anthropic's Claude. However, a more nuanced approach may both support employee engagement among those who want to use ChatGPT and allow businesses to gain some of the potential benefits that the platform provides. This will require creating appropriate policies and culture around responsible use, as well as explicitly creating a list of appropriate use cases. These use cases and policies will need to follow a change management process if they are to be successfully communicated and implemented across the organization.

Security and privacy concerns need to be addressed

The reason that many larger businesses are banning their staff's use of ChatGPT is that they are concerned about the security of the tool. There is a risk that things such as personal information or proprietary code, entered into or generated by tools like ChatGPT, may be accessible to other users or malevolent actors. This is why Google has advised its own staff to avoid putting confidential or sensitive material into generative AI tools, including its own Bard service.[21]

Until enterprise solutions are available, businesses will need to quickly establish acceptable use policies to inform their staff about the risks and how to use generative AI safely and effectively. Organizational leaders will also need to assess the risks of new generative AI tools as they are developed. For example, ChatGPT is developing a business-focused product that will allow for better control over the data entered into the tool and for enterprises to manage their end users.[22]

20 Naidu, Coulter, and Lange, "ChatGPT Fever Spreads to U.S. Workplace."

21 Dastin and Tong, "Google, One of AI's Biggest Backers, Warns Own Staff About Chatbots."
22 OpenAI, "New Ways to Manage Your Data in ChatGPT."

Be aware of regulatory changes

Because of the security and privacy risks associated with generative AI, rules and regulations regarding its use will be coming. These may come from professional bodies and associations that regulate the behaviour of their members, and from different levels of government. At an extreme, use of the tools may be disrupted, as it was temporarily in Italy in March and April.[23] This means that businesses that make use of generative AI tools will need to keep abreast of regulatory changes to ensure compliance among their staff.

Opting out of AI may not be an option

Despite the risks, the widespread potential for generative AI tools to improve writing efficiency at most organizations means that it cannot be ignored. The ability of organizations to identify relevant technologies and effectively deploy them, is a contributing factor to growth performance.[24] Given the rapid uptake we have witnessed for these tools, firms that do not learn how to best make use of them risk being left behind by their competitors. Those with the means may choose to build their own in-house generative AI tools that leverage pre-existing LLMs to take advantage of the potential opportunities and to address some of the security challenges.

To take advantage of the opportunities that AI represents, businesses can do three things. First, understand which tools are already available, how they are being used, and how to mitigate any potential risks to their business. Second, assess how those use cases apply to their workplaces and how they might drive efficiency improvements. Finally, create and disseminate appropriate use policies with their staff.

23 Robertson, "ChatGPT Returns to Italy After Ban."

24 Gresch, *A Better Yardstick.*

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