Navigar

The Navigar team • Aug 23, 2023

2023 Canadian IT labour market outlook: Closing the automation skill gap

This report was produced as part of a project funded by the Future Skills Centre (FSC), with financial support from the Government of Canada's Future Skills Program.

FSC 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 ADE, and The Conference Board of Canada

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The IT industry remains a vital Canadian employer and its labour-market needs are evolving at speed.

Canada must urgently address the skills gap that is growing as traditional technologies and the jobs linked to them shift rapidly. This paper identifies the specific skills that IT professionals should focus on now and for the future.

SUMMARY

Revenue for the information technology (IT) sector accounts for 5% of Canada's economy, and IT workers comprise 4% of Canada's total workforce.

While most companies operating in IT services foresee new job creation in the next five years, a widening skills gap must be addressed as traditional IT jobs change or sunset, and new needs and skill sets arise.

This paper considers the opportunities for IT professionals in the Canadian labour market and specifically looks at the role of an IT Officer. It outlines how this job landscape will change in the next five years and identifies specific skills that IT workers must develop to evolve with their roles or seek new opportunities in the sector.

Information technology (IT) encompasses a diverse set of tools and resources that are used to transmit, store, create, share, and exchange information.

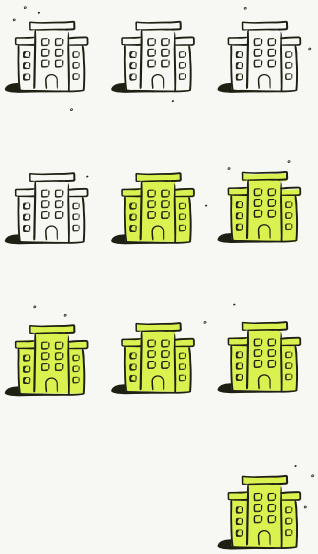
Canadian IT labour market

The IT industry includes companies, organizations, and departments that create or are responsible for computing devices, cloud technologies, live broadcasting, software systems, mobile applications, telephony services, and others.

In 2021, more than 200,000 Canadians worked in the IT industry—nearly 4% of the country's total workforce. More than 45,000 companies are in the Canadian IT sector, comprising 5% of Canada's economy; those companies account for $242 Billion in revenue and $100 Billion of Canada's GDP. [1]

The IT sector is experiencing both growth and change—joint forces at the root of a widening skills gap. According to the World Economic Forum, 60% of companies operating in IT services foresee job creation in the next five years.[2] At the same time, it is one of the most eager sectors to adopt new technologies. For example, artificial intelligence (AI) is driving soaring implementation among IT-sector companies of technologies that automate tasks traditionally executed by humans.

Process automation and solution discovery are two such technologies. Process automation software applies pre-programmed, rules-based logic to complete processing tasks such as quantitative calculations, process onboarding, monitoring, and simple robotic movements. Solution discovery systems tackle complex, unstructured problems and look to find solutions. Examples include research software, drug discovery, prediction and simulation.



60%

of companies operating in IT services foresee job creation in the next 5 years.

1 Innovation, Science and Economic Development Canada. Canadian ICT Sector Profile 2021: https://ised-isde.canada.ca/site/digital-technologies-ict/en/canadian-ict-sector-profile
2 World Economic Forum. Future of Jobs Report 2023: https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf

Technology adoption plans of IT-sector organizations[3]

3 World Economic Forum. Future of Jobs Report 2023: https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf

80% +

will adopt the Internet of things (IoT) and connected devices

will adopt encryption and cybersecurity

90%

will adopt digital platforms and apps

will increase adoption of new and frontier technologies

87%

will adopt cloud computing

89%

will adopt big-data analytics

88%

will adopt artificial intelligence

intend to broaden digital access

While the IT industry remains a vital Canadian employer and increasingly requires skilled workers, its labour market needs are evolving at speed. Canada must urgently define and address the skills gap that is growing as traditional information technologies and the jobs linked to them shift rapidly in the current and future economy. At Navigar, we have taken up that challenge.

Defining the skills gap

The IT profession requires a set of general IT skills and within that, specific jobs emphasize some skills over others. The importance of those skills evolves over time. To help members of the Professional Institute of the Public Service of Canada (PIPSC) adequately plan and future-proof their careers, the Navigar team analyses the required skills of specific jobs and defines how the need for each skill is evolving.[4]

It is evident that, beyond foundational IT skills, IT professionals generally require:

- A growth mindset to take accountability for self-study and development, which is critical to keep pace with evolving technology.
- A focus on achievement to deal with the tasks and challenges of IT work, which is often unsupervised and requires individual motivation and a willingness to step up to new challenges.
- Critical thinking, logic, and reasoning to identify the strengths and weaknesses of alternative solutions to complex issues.

Most IT-sector organizations plan to adopt leading-edge technologies, including AI as well as new and frontier technologies.

Canada must urgently define and address the skills gap that is growing as traditional IT technologies and the jobs linked to them shift rapidly in the current and future economy.

4 Based on data from Faethm, analyzed and presented by Navigar.

For IT professionals, we monitor 32 required skills grouped into five capability areas:

01 Data literacy capability

- Data ethics
- Visualizing data
- Operationalizing data
- Programming skills
- Research & problem-solving skills
- Statistics & predictive models
- Machine learning & AI skills

02 Digital literacy capability

- Cyber awareness
- Digital collaboration
- Digital communications
- Foundational IT skills
- Learning skills
- Participation skills

03 Core future capability

- Achievement focus
- Creativity
- Critical thinking
- Emotional intelligence
- Cultural and social intelligence
- Innovation & entrepreneurship
- Personal learning & mastery
- Problem solving skills

04 Leadership capability

- Agility
- Direction & purpose
- Engagement & culture
- Judgement & decision-making skills

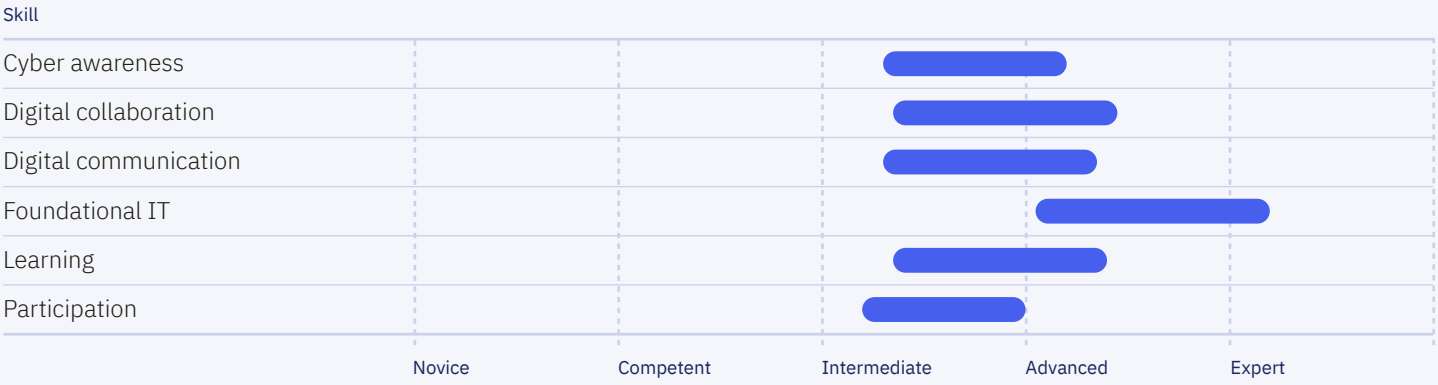
05 Outcome capability

- Collaboration
- Communication
- Customer focus
- Ethics
- People management
- Process improvement
- Value orientation

IT professional: Change in level of ability required per skill between 2022 and 2027

01 Data literacy capability

02 Digital literacy capability

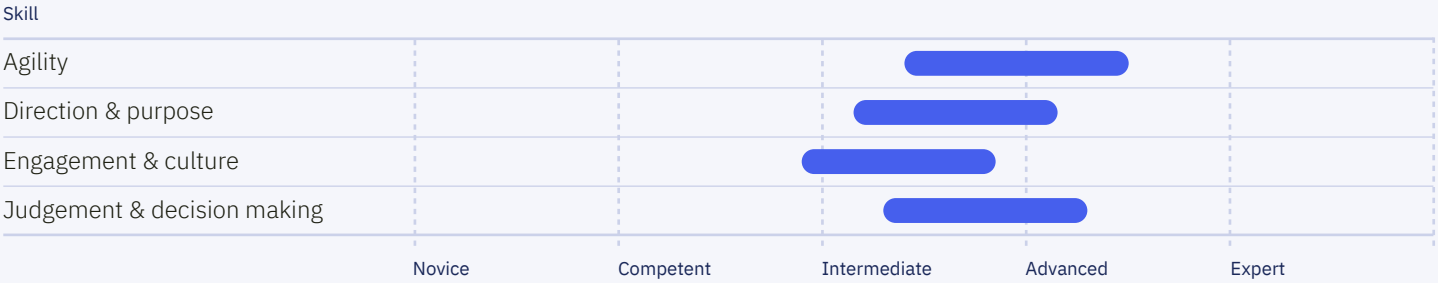


While the level of ability required for IT professionals has increased across the board, there is a notable emphasis on certain skills, particularly in the Core Future and Digital Literacy capability areas.

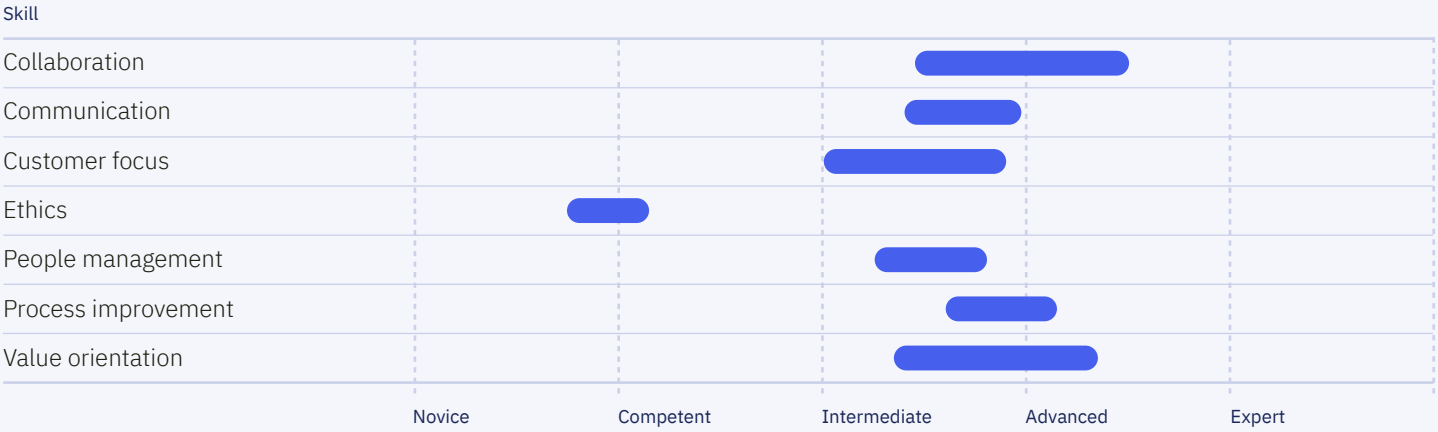
Data from Faethm, analyzed and presented by Navigar

03 Core future capability

04 Leadership capability



05 Outcome capability



Data from Faethm, analyzed and presented by Navigar

Two emerging technologies are transforming the IT workforce: process automation and solution discovery systems.

Navigar projects that, by 2027, 7% of all IT roles will be entirely automated by those technologies and 17% of IT roles will be augmented by them.

Practically speaking, all IT professionals must become experts in utilizing foundational technologies that allow them to perform their roles, must constantly embrace new learning and development pathways, must work towards personal and professional development, engage with teams, and develop innovative solutions.

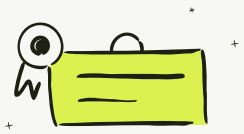
By 2027

7%

of all **IT roles** will be entirely automated

17%

of **IT roles** will be augmented by process automation and solution discovery systems



Thus, IT professionals of all kinds should seek to bolster these skills:

- Foundational IT knowledge
- Personal learning & mastery
- Critical thinking
- Achievement focus

The role of an IT Officer is to administer software and technologies that power business processes and functions.

IT Officers install and configure computer systems, diagnose faults, and solve problems with software, hardware, and applications.

These jobs will be disproportionately affected by the expected implementation of process automation and solution discovery systems. Navigar projects that, by 2027, 16% of IT Officer jobs will be entirely automated and 14% of IT Officer jobs will be augmented by these technologies.

By 2027

16%

of **IT Officer jobs** will be entirely automated

14%

of **IT Officer jobs** will be augmented by process automation and solution discovery systems

To "future-proof" and ensure their professional relevance over the course of their careers, IT Officers must master core IT skills specific to their roles, to become experts in the tools of their trade, such as specific software, hardware, systems, and processes. But beyond a comprehensive understanding of Foundational IT skills, IT Officers must also develop skills in these areas:

- Achievement focus, personal learning & mastery to consistently learn new skills, master existing ones, and develop new means of learning.
- Collaboration to work effectively with colleagues and other support teams to ensure complex tasks are adequately handled.

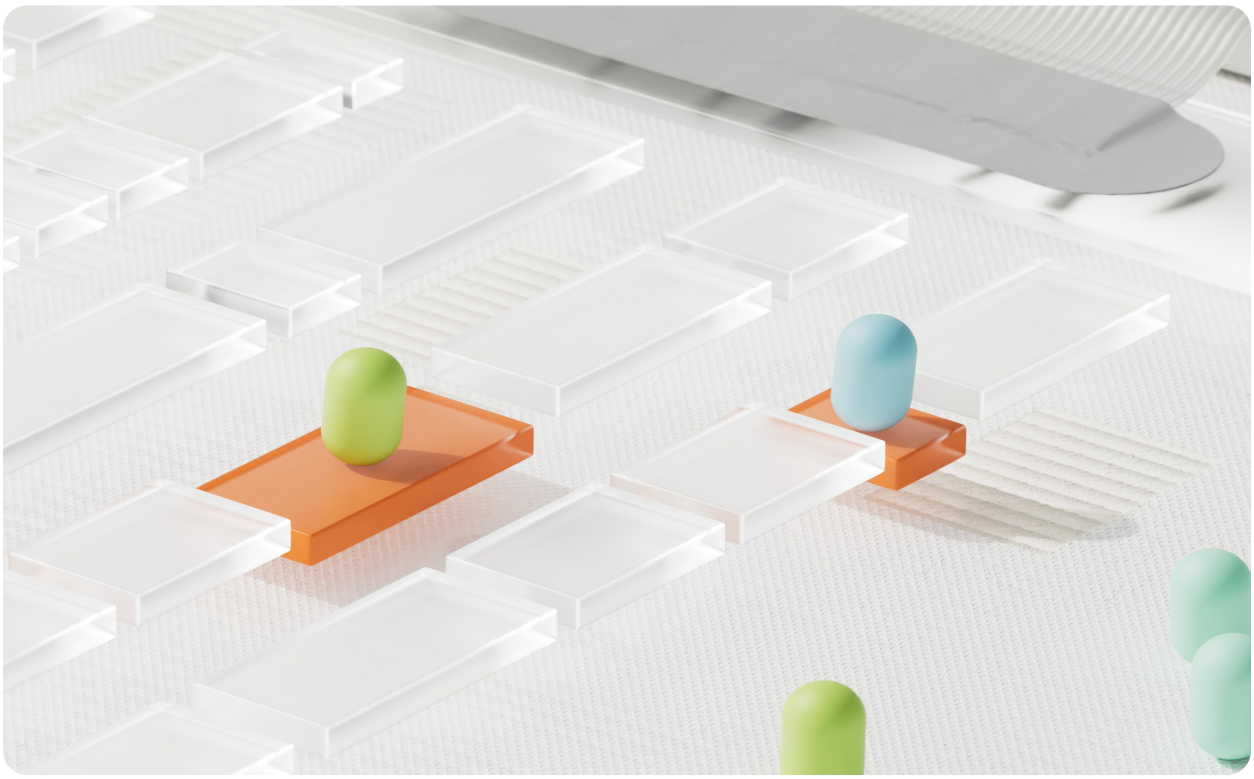
– Agility and adaptability to stay up to date with ever-evolving software and operating systems.

– Critical thinking & problem-solving to understand the processes and logic required to understand systems, trouble shoot technical issues, and fix hardware and software failures.

Addressing the skills gap using Navigar

Navigar is a smart online skills development planning tool developed by PIPSC to help our members get from where they are in their careers to where they want to go. To do so, Navigar leverages labour market data and AI to identify the skills required to bridge gaps. The tool then lists training options that the member can explore through respective training providers, such as Percipio and Canada School of Public Service (CSPS).

Using the example of the IT Officer role above, Navigar would recommend courses that focus on data and software analysis, problem solving, communication, and building relationships. Some relevant courses from Percipio that Navigar may recommend would include: “Basic Coding”, “Decision Making and Problem Solving”, “Getting to the Root of a Problem”, and “The Art of Communication”.



By analyzing labour-market data and insights from Faethm and other sources, this paper has identified the skills needs of the Canadian IT sector. Key findings include:

- Skills gaps in the IT sector are widening quickly
- Of all new technology, the rapid uptake of process automation and solution discovery systems will have the most significant impact on IT sector jobs
- To keep pace with technological change and continue to meet the needs of the IT sector, IT professionals must continuously upskill
- Beyond continuous development in foundational IT skills, IT professionals must advance in the areas of personal learning and mastery, critical thinking, and achievement focus

PIPSC members can access skills development guidance that is specific to them by using the free Navigar tool at www.navigar.ca

To develop knowledge resources like this paper, PIPSC's Navigar team leverages data from Faethm to gather, analyze, and consolidate insights on the future of work. Faethm forecasts the impacts of technologies on workers, companies, industries, and entire economies. This includes global workforce trends, AI-driven predictive analysis, and job-skill requirements for specific roles.

Based on these insights, we identify the skills required to develop in a career or to change career paths using the following methodology:

1 – Identify capability areas and skills

To meaningfully apply Faethm's insights for PIPSC members, the Navigar team developed capability areas and skills associated with each. The importance of a capability area varies between industries and job positions. And, while all IT professionals require foundational IT skills, the specific information technologies will vary depending on the workplace's needs.

2 – Score skills by importance

To better conceptualize each skill, we rank them on a sliding scale from 0 to 100. A higher rating indicates that a greater capacity in the skill is required to perform the requirements of a position. For example, a score of 50 indicates that a position requires competency in that skill, while a score of 90 indicates that an expert level capability is necessary. The required skills and ratings vary between industries and job positions. For example, an IT position will have a higher score for the Visualizing Data skill than a nursing position.

3 – Track and predict changes in skill requirements over time

We measure skill level requirements over time to track shifts in labour market needs. Specifically, we compare the capability level required for someone to perform a given position's responsibilities in 2022 to what the same position will require in 2027. This allows us to measure how a position's capabilities and skills must change to meet evolving requirements.

In addition to the insights from the Navigar platform, our researchers also rely on a variety of reputable sources, including the Government of Canada census, economic, and business intelligence data; the World Economic Forum; and the International Labour Organization. We also build on PIPSC's deep knowledge of the Canadian public sector workplace based on our 70,000 members.

ENDNOTES

"Canadian ICT Sector Profile 2021," Innovation, Science and Economic Development Canada, accessed Jul 30, 2023, https://ised-isde.canada.ca/site/digital-technologies-ict/en/canadian-ict-sector-profile.

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"Future of Jobs Report 2023", World Economic Forum, accessed May 31, 2023, https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf.

Navigar
POWERED BY PIPSC

Navigar is a smart online skills development tool built and maintained by a team at the Professional Institute of the Public Service of Canada (PIPSC).

Using data-driven insights, Navigar provides PIPSC members with clear skills development pathways tailored to their career goals.

The Navigar team of experts regularly curates and reports on Canadian labour-market intelligence. Our goal is to increase knowledge and provide actionable recommendations to help Canadians future-proof their careers.

Learn more at www.navigar.ca