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Analysis in Brief

Analysis on artificial intelligence use by businesses in Canada, second quarter of 2024

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As technologies advance, businesses are exploring how they can be used to improve efficiency. In Canada, technology adoption and innovation was reported by businesses as the leading factor (28.3%)[1] that improved their operational efficiency over the last year. Among technological advancements adopted by businesses, the integration of artificial intelligence (AI) in business processes is becoming more common.

AI has many different applications and can be used in a variety of ways across industries, ranging from customer service chatbots to predictive analytics in health care. One of the ways businesses are using AI is in producing goods and delivering services. While AI adoption for this purpose is in its early stages among businesses in Canada, 6.1% of all businesses made use of AI in producing goods and delivering services over the last year.

From the beginning of April to early May 2024, Statistics Canada conducted the Canadian Survey on Business Conditions to collect information on the environment businesses are currently operating in and their expectations moving forward. This iteration of the survey contains a new set of questions aimed at examining the use of AI by businesses in Canada. This article explores results from the survey related to the use of AI in producing goods and delivering services. Furthermore, this article explains the specific types of AI being used, such as machine learning, virtual agents and voice recognition, as well as the impact of AI adoption on tasks performed by employees and on employment levels.

Businesses in information and cultural industries leading artificial intelligence use

While 6.1% of all businesses have made use of AI in producing goods and delivering services over the last 12 months, AI uptake varies by industry. The industries in which businesses were most likely to have used AI in producing goods or delivering services were information and cultural industries (20.9%); professional, scientific and technical services (13.7%); and finance and insurance (10.9%). Conversely, businesses least likely to be using AI for this purpose were in agriculture, forestry, fishing and hunting (0.7%); accommodation and food services (0.9%); and mining, quarrying, and oil and gas extraction (1.6%).

Among businesses that reported using AI in producing goods or delivering services (6.1%), the most common application of AI used was natural language processing, reported by over one-quarter (28.9%) of businesses, followed by text analytics using AI (27.0%), virtual agents or chatbots (26.5%), data analytics using AI (25.0%), large language models (21.9%), and image and pattern recognition (21.8%).

As with AI use, the specific applications used by businesses differ by industry. For instance, among the businesses using AI in information and cultural industries (20.9%), over two-fifths (41.3%) reported using natural language processing, followed by over one-third (35.2%) using large language models, and over one-quarter (28.6%) using speech or voice recognition using AI. Meanwhile, among businesses in professional, scientific and technical services using AI (13.7%), the most common use was image or pattern recognition, reported by almost half (47.1%) of these businesses, followed by machine learning (39.0%). Of businesses in finance and insurance using AI (10.9%), two-thirds (66.8%) reported using virtual agents or chatbots, followed by 34.2% using data analytics using AI.

1. Statistics Canada. 2024. Table 33-10-0819-01 Aspects that improved the ability of business or organization to operate efficiently over the last 12 months, second quarter of 2024 [Data table].

Table 1
Use of artificial intelligence (AI) by selected industries in producing goods or delivering services over the last 12 months, second quarter of 2024

Type of AI application used	All industries	Information and cultural industries	Professional, scientific and technical services	Finance and insurance
	percent of businesses			
AI used in producing goods or delivering services	**6.1**	**20.9**	**13.7**	**10.9**
Natural language processing	28.9	41.3	24.2	30.5
Text analytics using AI	27.0	27.1	37.7	23.7
Virtual agents or chatbots	26.5	26.8	25.4	66.8
Data analytics using AI	25.0	18.4	27.0	34.2
Large language models	21.9	35.2	32.2	28.3
Image or pattern recognition	21.8	15.7	47.1	5.2
Machine learning	20.1	17.3	39.0	12.9
Speech or voice recognition using AI	18.1	28.6	12.5	30.8
Marketing automation using AI	15.2	28.0	16.0	5.9
Recommendation systems using AI	12.3	8.8	17.5	18.2
Decision making systems based on AI	6.1	10.2	1.1	20.9
Machine or computer vision	4.7	7.5	4.7	4.2
Neural networks	4.4	14.9	6.0	2.0
Augmented reality	2.6	2.7	2.5	2.1
Robotics process automation	2.6	2.4	0.9	3.6
Deep learning	1.9	4.9	1.9	2.0
Biometrics	1.0	2.4	0.0	2.5
Other	6.7	18.3	4.3	0.8

Notes: The results in this table are based on the survey that was in collection from April 2 to May 6, 2024, and respondents were asked what the business or organization experienced in the last 12-month period. As a result, those 12 months could range from April 2, 2023, to May 6, 2024, depending on when the business responded.
Source: Canadian Survey on Business Conditions, second quarter of 2024 (Table 33-10-0825-01).

Majority of businesses reported no change to their number of employees after adopting artificial intelligence

A frequent question is whether and to what extent AI leads to employment reduction through the elimination of tasks previously performed by employees. The vast majority of businesses (84.9%) reported no change in their employment levels after implementing AI in producing goods or delivering services. Of the businesses who reported using AI (6.1%), 6.3% of those businesses in Canada reported their total employment decreased after AI introduction. Similarly, among the industries leading in AI use, the majority of businesses reported no change to their employment after implementing AI. This was reported by 91.2% of businesses in finance and insurance, followed by 89.8% of businesses in professional, scientific, and technical services, and 79.2% of businesses in information and cultural industries. Meanwhile, 17.6% of businesses in information and cultural industries reported an increase in employment after implementing AI in producing goods or delivering services, followed by 10.0% in professional, scientific and technical services and 1.8% in finance and insurance.

Businesses that reported using AI in producing goods or delivering services (6.1%) were asked to what extent AI reduced tasks previously performed by employees. Overall, nearly half (44.1%) of these businesses found the use of AI reduced tasks previously performed by employees by a small extent, while 39.2% reported tasks were reduced either by a moderate or large extent. Nearly half of businesses in finance and insurance (48.3%) and professional, scientific and technical services (47.2%) reported tasks previously performed by employees were reduced by a small extent. Similarly, 42.5% of businesses in information and cultural industries reported AI reduced tasks previously performed by employees by a small extent with almost one-quarter (21.4%) reporting tasks were reduced by no extent.

Table 2
Extent to which artificial intelligence has reduced tasks previously performed by employees by industry, second quarter of 2024

	Moderate or large extent	Small extent	No extent
	percent of businesses		
All industries	**39.2**	**44.1**	**16.7**
Information and cultural industries	36.1	42.5	21.4
Finance and insurance	28.3	48.3	23.3
Professional, scientific and technical services	42.1	47.2	10.7

Notes: The results in this table are based on the survey that was in collection from April 2 to May 6, 2024, and respondents were asked what the business or organization experienced in the last 12-month period. As a result, those 12 months could range from April 2, 2023, to May 6, 2024, depending on when the business responded.
Source: Canadian Survey on Business Conditions, second quarter of 2024 (Table 33-10-0826-01).

More businesses are training employees in artificial intelligence use

AI has the potential to reshape how businesses operate. In the process, it inevitably necessitates changes. Businesses that reported the use of AI in producing goods or delivering services (6.1%) were asked about the changes made to the business when AI was implemented. Most commonly, 38.5% of businesses trained current staff to use AI. Furthermore, 35.2% of businesses developed new workflows after implementing AI, while 20.9% changed data collection or data management practices. Conversely, hiring staff trained in AI was the least common change reported by businesses when using AI to produce goods or deliver services, with 8.2% reporting this change.

Table 3
Changes made by businesses when using artificial intelligence (AI) in producing goods or delivering services, second quarter of 2024

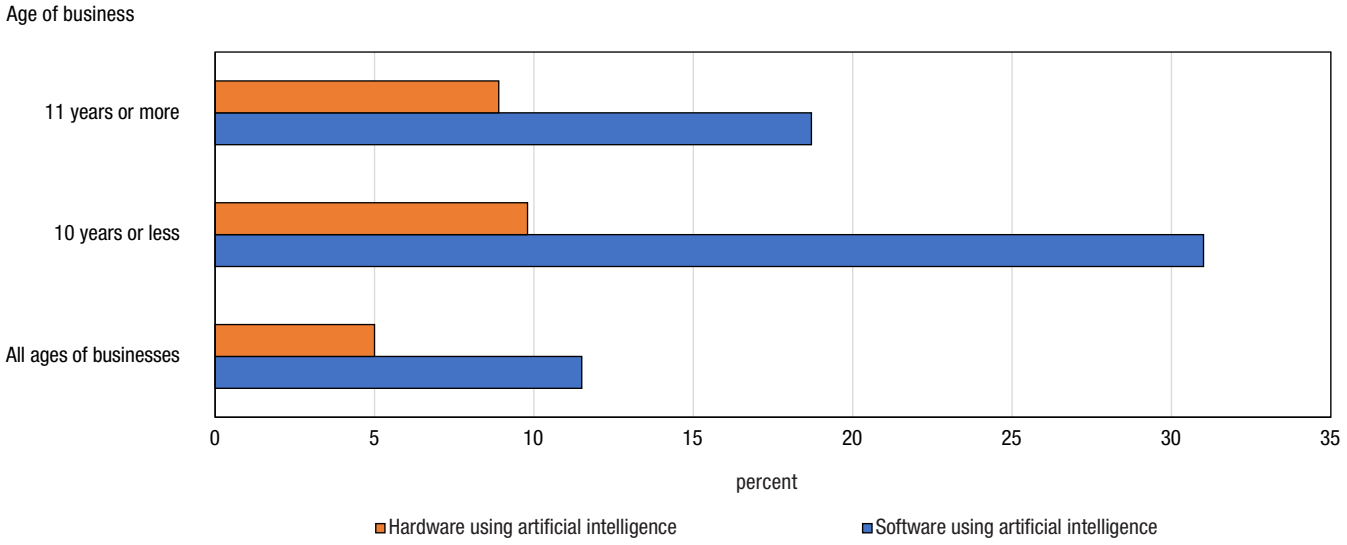
	Percent of businesses
Trained current staff to use AI	38.5
Developed new workflows	35.2
Changed data collection or data management practices	20.9
Purchased computing power or specialized equipment	16.5
Purchased cloud services or cloud storage	16.1
Used in vendors or consulting services to install or integrate AI	11.3
Hired staff trained in AI	8.2
Other	0.0
None	28.1

Notes: The results in this table are based on the survey that was in collection from April 2 to May 6, 2024, and respondents were asked what the business or organization experienced in the last 12-month period. As a result, those 12 months could range from April 2, 2023, to May 6, 2024, depending on when the business responded.
Source: Canadian Survey on Business Conditions, second quarter of 2024 (Table 33-10-0827-01).

Newer businesses more likely to plan to adopt artificial intelligence software over the next 12 months

Newer businesses are more likely to have plans to adopt AI software over the next 12 months than older businesses. Businesses aged 10 years or less (31.0%) were more likely to report plans to adopt software using AI than businesses aged 11 years or more (18.7%). Close to 1 in 10 businesses aged 10 years or less (9.8%) and aged 11 years or more (8.9%) planned to adopt hardware using AI within the upcoming year.

Chart 1
Businesses with plans to adopt or incorporate artifical intelligence software and hardware over the next 12 months by age of business, second quarter of 2024



Notes: The results in this table are based on the survey that was in collection from April 2 to May 6, 2024, and respondents were asked what the business or organization experienced in the last 12-month period. As a result, those 12 months could range from April 2, 2023 to May 6, 2024, depending on when the business responded.
Source: Canadian Survey on Business Conditions, second quarter of 2024 (Table 33-10-0822-01).

Businesses were more likely to have plans to adopt AI software over the next 12 months in professional, scientific and technical services (26.6%); information and cultural industries (24.3%); and finance and insurance (12.9%). Meanwhile, businesses were more likely to plan to adopt AI hardware over the next 12 months in agriculture, forestry, fishing and hunting (10.8%); professional, scientific and technical services (10.0%); and transportation and warehousing (9.9%). It is important to note that these results refer to the future plans of all businesses, irrespective of whether they are already using AI or have previously used AI technologies.

Methodology

From April 2 to May 6, 2024, representatives from businesses across Canada were invited to complete an online questionnaire about business conditions and business expectations moving forward. The Canadian Survey on Business Conditions uses a stratified random sample of business establishments with employees classified by geography, industry sector and size. Proportions are estimated using calibrated weights to calculate the population totals in the domains of interest. The total sample size for this iteration of the survey was 20,996 and results are based on responses from a total of 10,173 businesses or organizations.

References

Statistics Canada. 2024. Canadian Survey on Business Conditions, second quarter of 2024.