

Survey of Innovation and Business Strategy

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Business intelligence technologies are the most commonly used advanced technology

Advanced technologies are new technologies (equipment and software) that perform a new function or significantly improve some functions compared with other commonly used technologies in the industry or by competitors, allowing businesses to function more efficiently and competitively. Advanced technologies can either be developed in-house or purchased from outside.

In 2017, over 4 in 10 enterprises (42.8%) used at least one type of advanced technology. Business intelligence technologies (22.5%), such as cloud-based computing systems and big data analytical tools, were the type of advanced technology most commonly adopted by enterprises. Business intelligence technologies were more likely to be adopted by large enterprises (36.9%) than by medium-sized (29.2%) or small (20.7%) enterprises. The use of business intelligence technologies was concentrated in three service industry sectors, where over 4 in 10 enterprises reported their use: information and cultural industries (47.0%), finance and insurance excluding monetary authorities (43.7%) and professional, scientific and technical services (41.2%).

The larger the enterprise, the more likely it was to adopt an advanced technology. Specifically, 60.2% of large enterprises used at least one type of advanced technology in 2017, compared with 51.0% of medium-sized enterprises and 40.6% of small enterprises.

In general, businesses in all regions of Canada showed the same propensity to adopt advanced technologies. The exception was Atlantic Canada, where a smaller share (35.3%) of enterprises reported using them.

Technologies that have the potential to fundamentally transform business activities, but that are typically in early stages of implementation, are considered to be emerging. Nearly 2 in 10 enterprises (18.9%) adopted at least one type of emerging technology in 2017.

As was the case with advanced technologies, the larger the firm, the more likely it was to adopt emerging technologies. In addition, businesses in Central Canada—Quebec (21.7%) and Ontario (21.1%)—were more likely to adopt these new technologies than businesses in Atlantic Canada (12.3%), or in the rest of the country (15.1%).

"Integrated Internet of Things (IoT) systems" (systems where devices and objects have communication connectivity) were the most common emerging technology, with 12.2% of enterprises using them. By comparison, businesses were less likely to use artificial intelligence (AI) (4.0%) and geomatics or geospatial technologies (3.7%). Less than 2% of businesses reported using nanotechnology, biotechnology or blockchain technologies.

Businesses in information and cultural industries (21.3%), finance and insurance (excluding monetary authorities) (20.6%), and utilities (18.8%) were the most likely to use integrated IoT systems. Finance and insurance (excluding monetary authorities) also posted the highest adoption rates for AI (19.1%) and blockchain technologies (13.4%).

AI was more likely to be adopted by large enterprises (10.1%) than by medium-sized (7.1%) or small (3.2%) enterprises. By sector, in addition to finance and insurance, the highest rates of adoption were reported by enterprises in information and cultural industries (16.8%) and professional, scientific and technical services (11.5%).

Among businesses that did not use advanced or emerging technologies, more than one-third reported that these technologies were not applicable to their business (37.4%) or that they did not need to invest in them to continue their operations (37.0%). A smaller share of enterprises indicated that these technologies were generally not worth the cost; some were not convinced of the economic benefit of adopting advanced or emerging technologies (18.2%), or were dissuaded by their high cost (18.2%).



Table 1
Share of enterprises using advanced or emerging technologies, 2017

	Enterprises using advanced technologies in 2017 ¹	Enterprises using emerging technologies in 2017 ²	Enterprises using advanced or emerging technologies in 2017 ³
	%		
Total	42.8	18.9	46.1
Size			
Small	40.6	17.6	44.0
Medium-sized	51.0	23.2	53.3
Large	60.2	29.1	63.0
Region			
Atlantic Canada	35.3	12.3	37.3
Quebec	42.4	21.7	46.7
Ontario	42.9	21.1	46.6
Rest of Canada	44.4	15.1	46.5
Industry			
Agriculture, forestry, fishing and hunting	37.6	22.3	44.4
Mining, quarrying, and oil and gas extraction	39.2	21.8	45.7
Utilities	67.3	36.7	70.6
Construction	36.3	19.9	39.8
Manufacturing	52.8	15.5	54.7
Total selected services	41.9	19.2	45.2
Wholesale trade	52.9	18.9	56.5
Retail trade	28.7	11.0	29.9
Transportation and warehousing	45.6	16.1	48.4
Information and cultural industries	59.8	35.2	62.8
Finance and insurance excluding monetary authorities	54.8	28.4	57.2
Real estate and rental and leasing	37.7	11.2	38.9
Professional, scientific and technical services	56.1	38.4	63.8
Management of companies and enterprises	33.0	9.4	34.5
Administrative and support, waste management and remediation services	36.4	17.5	41.5

1. Percentage of enterprises using advanced technology in 2017 includes enterprises that used at least one of the following advanced technologies: material handling, supply chain or logistics technologies; design or information control technologies; processing or fabrication technologies; clean technologies; security or advanced authentication systems; business intelligence technologies; or other types of advanced technologies.
 2. Percentage of enterprises using emerging technology in 2017 includes enterprises that used at least one of the following emerging technologies: nanotechnology; biotechnology; geomatics or geospatial technologies; artificial intelligence; integrated Internet of Things systems; blockchain technologies; or other types of emerging technologies.
 3. Percentage of enterprises using advanced or emerging technologies in 2017 includes enterprises that used at least one type of advanced or emerging technology.
- Source(s): Table 27-10-0367-01.

Clean technologies used by 1 in 10 enterprises

Clean technologies refer to any goods or services that reduce environmental impacts through environmental protection activities or the sustainable use of natural resources.

In general, enterprises were less likely to use clean technologies (10.0%) than other types of advanced technologies. However, some industries and sectors reported relatively high rates of clean technology use, notably businesses in pipeline transportation (37.6%) and utilities (36.1%). About 2 in 10 enterprises in rail and water transportation (22.0%) and oil and gas extraction (20.3%) also reported using clean technologies.

Enterprises primarily used clean technologies for environmental protection (90.1%), sustainable resource management (75.7%) and adapting goods (59.4%). Construction businesses reported the highest rate in the use of clean technologies to protect the environment (98.4%), while 89.6% of utilities enterprises used them to manage sustainable resources.

Environmental benefits from innovation are more often related to end users or consumers

Environmental benefits can result from the use of emerging or advanced technologies (such as clean technologies), but can also arise from the implementation of innovations.

From 2015 to 2017, just over one-third (35.4%) of innovative enterprises (those that implemented any type of innovation during the three-year period) reported introducing an innovation that had environmental benefits for the end user or consumer. Enterprises in utilities (54.4%) and agriculture, forestry, fishing and hunting (50.5%) were the most likely to report this.

Comparatively, just over 2 in 10 (22.0%) innovative businesses reported innovations that had increased environmental protection activities as an environmental benefit. Again, enterprises in agriculture, forestry, fishing and hunting (52.8%), and utilities (44.1%) most commonly reported this benefit.

In addition, 47.5% of enterprises that implemented product or process innovations from 2015 to 2017 reported environmental benefits related to the efficient use of production resources. Almost three-quarters (72.2%) of businesses in agriculture, forestry, fishing and hunting reported such benefits, followed by enterprises in mining, quarrying, and oil and gas extraction (57.6%).

The most common environmental benefit reported by product or process innovators was reduced consumption of resources through recycling water, waste or material (30.3%), followed by improved resource efficiency through the reduced use of energy (26.3%) and material (24.7%). Benefits related to the use of renewable fuels, such as ethanol, biodiesel, biogas, biochar and hydrogen, were the least frequent (4.9%).

Note to readers

The 2017 Survey of Innovation and Business Strategy (SIBS) is a joint initiative of Statistics Canada; Innovation, Science and Economic Development Canada; Global Affairs Canada; the Bank of Canada; the Atlantic Canada Opportunities Agency; Institut de la statistique du Québec; and the Ontario Ministry of Economic Development, Job Creation and Trade.

SIBS 2017 provides key information on strategic decisions, innovation activities and operational tactics used by Canadian enterprises. Innovation data are collected for a three-year period. For SIBS 2017, the three-year period was 2015 to 2017. For the previous iterations of the survey, SIBS 2012 and SIBS 2009, the periods were 2010 to 2012 and 2007 to 2009, respectively. While the questionnaires for SIBS 2009 and 2012 were similar, changes in content and design were made to the SIBS 2017 questionnaire.

The SIBS 2017 sample was composed of 13,252 enterprises, representing a population of 66,474 enterprises in Canada with at least 20 employees and revenues of \$250,000 or more. These enterprises spanned 14 sectors within the North American Industry Classification Systems (2012), and included more detailed selected industry groups and industries.

In 2017, the sample was stratified into four regions: the Atlantic region; Quebec; Ontario; and the rest of Canada. For Canada, the sample was also stratified by industry groups and by enterprise size: small (20 to 99 employees); medium-sized (100 to 249 employees); and large (250 or more employees). Data collection for the 2017 reference period was undertaken between January and April 2018.

SIBS 2017 estimates are provided primarily as percentages accompanied by quality indicators. Data quality indicators for percentage estimates are based on standard error and number of observations in the estimates.

Data from SIBS 2012 and SIBS 2009 are available in archived tables ([12-604-X](#)).

Available tables: [27-10-0149-01](#), [27-10-0356-01](#), [27-10-0365-01](#) to [27-10-0369-01](#) , [33-10-0153-01](#) to [33-10-0159-01](#) , [33-10-0166-01](#), [33-10-0167-01](#), [33-10-0173-01](#) to [33-10-0179-01](#) , [33-10-0181-01](#) to [33-10-0183-01](#) and [33-10-0193-01](#).

Definitions, data sources and methods: survey number [5171](#).

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; STATCAN.infostats-infostats.STATCAN@canada.ca) or Media Relations (613-951-4636; STATCAN.mediahotline-ligneinfomedias.STATCAN@canada.ca).