



Innovation, Advanced Technologies and Practices in the Construction and Related Industries

Please correct name and address if necessary



Information for Respondents

Survey Purpose

The objective of this survey is to provide information on innovation, advanced technology and advanced practices being used in the construction and related industries. The information in the survey can be used by businesses for market analysis, by trade associations to study performance and other characteristics of their industries, and by government to develop national and regional economic policies.

Authority

This survey is conducted under the authority of the Statistics Act, Revised Statutes of Canada, Chapter S19. Completion of this questionnaire is a legal requirement under the Statistics Act.

Confidentiality

Statistics Canada is prohibited by law from publishing any statistics which would divulge information obtained from this survey that relates to any identifiable business without the previous consent of that business. The data reported in this questionnaire will be treated in strict confidence, used for statistical purposes and published in aggregate form only. Statistics Canada will create a data base combining individual survey responses with existing Statistics Canada data records. The confidentiality provisions of the Statistics Act are not affected by either the Access to Information Act or any other legislation.

Assistance

If you require assistance in the completion of this form or have any questions regarding this survey, please contact:

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E-Mail: prieur@statcan.ca

Certification

Please indicate the name of the person completing this form so we know who to contact should we have questions about this report.

Name <i>(please print)</i>	Official position:	
Internet address:	Telephone No. ()	Fax No. ()

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2. Please rate the importance of each of the following factors for the success of your business.

Please indicate your opinion by using the following scale where 1 is low importance and 5 is high importance. Indicate 0 if not relevant to your business.

	Importance					Not Relevant
	Low				High	
	1	2	3	4	5	0
	←—————→					
Strategy within your business						
Developing unique expertise or a unique market	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Delivering products or services which reduce the client's operating costs	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Seeking business outside of your present geographical region of activity	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Increasing your market share	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Building and enhancing relationships with existing clients	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Attracting new clients	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Providing a broader range of services to your clients	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Ensuring employees are aware of business issues	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Human Resources within your business						
Encouraging and rewarding your employees to seek out technological improvements	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Encouraging and rewarding your employees to seek out organizational improvements	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Providing or supporting training programs for employees	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Hiring new graduates from colleges and universities	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Hiring experienced employees	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Participating in apprenticeship programs	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Using teams which bring together people with different skills	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Technology within your business						
Introducing new user-friendly technologies	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Investing in research and development	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Protecting intellectual property (patents, trademarks, copyrights, etc.)	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Enhancing your technical capabilities	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>
Participating in the development of industry standards and practices	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>	0 <input type="radio"/>

List of Definitions

Advanced Technologies

Communications

E-mail: Refers to electronic mail.

Digital photography for progress reporting: The use of digital photography to record progress on a work-site so it can be transmitted by electronic means.

Office-to-site video links or video conferencing: The use of video cameras to communicate between the site and other locations. Can be used to solve problems on the site without bringing people to the site.

Company computer network: LAN (local area network) for communications within a building or WAN (wide area network) for communications within a business extending beyond a single building or site.

On-site plant and equipment

Laser-guided equipment: Equipment which incorporates a laser. An example is a bulldozer or a grader with on-board computerized grade information and a laser sensor which assists the operator in excavating/grading to a precise level.

Automated systems and/or programmable machines: Automated systems and programmable machines incorporate computer technologies to carry out specific tasks. Examples include bar code readers and automated welding machines.

GPS (Global Positioning Systems): Surveying equipment that determines the exact position with the aid of satellites. Other applications include the use of GPS to determine the location of delivery trucks or other vehicles.

Materials and systems

High performance concrete: Concrete that has been modified to achieve superior performance in terms of strength or other desired characteristics.

Composite materials (e.g. fiber reinforced plastics) : A synthetic material reinforced with other materials to achieve superior performance characteristics.

Recycled plastics components: Products that incorporate plastics that have already been used and are used to make another product.

Systems

Remote sensing and monitoring systems (e.g. "smart" detection systems): Systems incorporating sensors for monitoring.

Bio-remediation clean-up: Bio-remediation involves the use of microorganisms to clean up contaminated soil.

Preassembled air, water, power distribution systems (e.g. "drop-in" systems): Systems that are produced off-site and transported to the construction site where they are easily installed.

"Clean room" technology: Technology that assures that rooms are super-clean (hospital operating rooms, computer chip fabrication, etc.). Clean rooms require special sub-systems and special materials.

Deconstruction and reuse systems: Taking a building or structure apart in such a manner that materials used can be reused and recycled.

Design

Computer Aided Design (CAD): Use of computer-based software to carry out design. CAD allows engineers, architects, or designers to produce complete designs on the computer screen and to visualize the implications of design changes on other aspects of the design.

Modeling or simulating technologies: Used to provide a computer-based visualization of the performance of a computer aided design. Modeling involves the approximation, representation or idealization of selected aspects of the structure, behavior, operation and characteristics of a real-world process, concept or system. Simulation is a model that behaves or operates like a given system when provided with a set of controlled input.

Electronic exchange of CAD files: Refers to the transfer of computer aided design files. If the exchange is outside of a company, then conversion or translation of the software files may be required because of incompatible software.

Advanced Technologies

3. Please check which of the following advanced technologies your business either:

- currently uses
- plans to use within two years; or
- has no plans to use within two years or is not applicable to your business

	Currently uses	Plans to use within 2 years	No plans/Not applicable
Communications			
E-mail			
Digital photography for progress reporting			
Office-to-site video links or video conferencing			
Company computer networks (LAN or WAN)			
On-site plant and equipment			
Laser-guided equipment			
Automated systems and programmable machines			
GPS (Global Positioning System)			
Materials			
High performance concrete			
Composite materials (e.g. fiber reinforced plastics)			
Recycled plastic components			
Systems			
Remote sensing and monitoring systems (e.g. "smart" detection systems)			
Bio-remediation clean-up			
Preassembled air, water, power distribution systems (e.g. "drop-in" systems)			
"Clean room" technology			
Deconstruction and reuse systems			
Design			
Computer aided design			
Modeling or simulation technologies			
Electronic exchange of CAD files			
Other advanced technologies (please specify)			

List of Definitions

Business Practices

Computerization

Computerized inventory control: Use of computers to manage a company's inventory.

Computerized estimating software: The use of computer software programs to estimate costs.

Computerized project management and/or scheduling software: The use of computer software to manage and/or schedule projects.

Quality

Quality certification (e.g. ISO 9000, R2000, etc.) : Quality systems that are introduced by a firm and which receive third-party validation. ISO 9000 for example is an internationally recognized series of quality system standards and guidelines used to certify the consistency of the way a business produces and delivers its products and services.

Organization

Written market analysis report to evaluate needs and opportunities of your business: A formal and structured analysis of the market carried out by the business or by a consultant hired by the business. A market analysis would lead to a market plan for the business.

Written documentation of technological improvements developed by your business: A formal and structured process to record and document all technological improvements that are developed by the business.

Written evaluation of new ideas in order to develop options for your business: Formal studies and reports prepared by the business or by consultants hired by a business to assess new ideas that are of interest to the business.

Written strategic plan: A formal and structured process carried out by the business or by a consultant hired by the business which leads to a strategic plan.

Business

Design-build contracts: With design-build contracts, owners specify the time lines and performance criteria sought for a project. In response, design-build teams comprising architects, engineers, contractors and in many cases building materials suppliers submit project proposals that indicate the project's design, cost and completion date. The owner then evaluates the submissions and selects the winning proposals. Significant savings often result from this approach.

Build-operate-transfer (BOT) contracts: An arrangement where the builders of a structure or building operate it for a specified length of time and at the end of the time transfer the building to the original financiers.

Post-commissioning inspection and maintenance contracts: Builders obtain an on-going contract to inspect and maintain the structure or building they built.

Long-term working arrangements with other businesses to work together on joint projects : Agreements between different businesses to work together jointly on projects. These working arrangements can be based on a formal contract or on an informal agreement.

Advanced Practices

4. Please check which of the following business practices your business either:

- currently uses
- plans to use within two years; or
- has no plans to use within two years or is not applicable to your business

	Currently uses	Plans to use within 2 years	No plans/Not applicable
Computerization			
Computerized inventory control			
Computerized estimating software			
Computerized project management and/or scheduling systems			
Quality			
Quality certification (e.g. ISO 9000, R2000, etc.)			
Organization			
Written market analysis report to evaluate needs and opportunities of your business			
Written documentation of technological improvements developed by your business			
Written evaluation of new ideas in order to develop options for your business			
Written strategic plan			
Business			
Design-build contracts			
Build-operate-transfer (BOT) contracts			
Post-commissioning inspection or maintenance contracts			
Long-term working arrangements with other businesses to work together on joint projects			
Other advanced practices (please specify)			

5. In the past three years has your business:

Please check all that apply.

- Been involved in a merger
- Acquired another business
- Set up a new line of business or a new division

Sources of information

6. Please indicate your sources of information on advanced technologies and advanced practices, such as those listed in Questions 3 and 4.

Please check all that apply.

- | | | | |
|---|--------------------------|--|--------------------------|
| Trade shows and conferences | <input type="checkbox"/> | Government facility owners or managers | <input type="checkbox"/> |
| Trade journals and newsletters | <input type="checkbox"/> | Non-government facility owners or managers | <input type="checkbox"/> |
| Trade associations | <input type="checkbox"/> | Federal information programs | <input type="checkbox"/> |
| Computer based information networks (including internet) | <input type="checkbox"/> | Federal research organizations | <input type="checkbox"/> |
| Suppliers of materials, supplies, machinery and equipment | <input type="checkbox"/> | Provincial research organizations | <input type="checkbox"/> |
| Clients | <input type="checkbox"/> | Universities and colleges | <input type="checkbox"/> |
| General contractors | <input type="checkbox"/> | Regulatory and standards organizations | <input type="checkbox"/> |
| Specialty trades | <input type="checkbox"/> | Testing and evaluation service firms | <input type="checkbox"/> |
| Consulting engineers | <input type="checkbox"/> | Business consultants | <input type="checkbox"/> |
| Architects | <input type="checkbox"/> | | |

Other sources of information (please specify)

Please list the most important source of information on advanced technologies and advanced practices for your business:

Obstacles

7. Please check the major obstacles for your business to using new and improved building products, building systems and construction equipment.

Please check all that apply

Market:

- High cost of products, systems and equipment
- Lack of interest by clients
- Resistance to change by businesses with which your business has joint projects
- Risk of legal liability
- Restrictive codes and standards

Human resources:

- Shortage of skilled workers
- Lack of in-house expertise
- Inability to train workers within the required time
- Worker resistance to change

External support services:

- Lack of technical support from vendors
- Lack of technical support from consultants
- Inability to evaluate new products and equipment

Other obstacles (*please specify*)

Please list the most important obstacle to using new and improved building products, building systems and construction equipment for your business:
