The Strong Link Inc.

Overview of Manufacturing, Technologies, Trends

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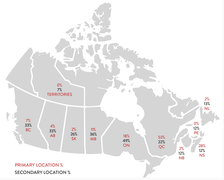
Manufacturing in Canada

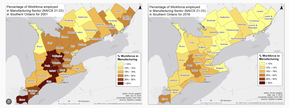
WHERE IS YOUR HEAD OFFICE OR PRIMARY LOCATION IN CANADA?

CME received 563 responses to our 2022 Labour and Skills Survey, representing all regions of Canada. The largest share of responses – about 50 per cent – came from Quebec. About 24 per cent have their primary operations in Western Canada, 18 per cent of respondents mainly operate in Ontario, and 8 per cent are headquartered in Atlantic Canada.

Some survey participants were for companies that have facilities in more than one province. Companies are most likely to have additional operations in Ontario, Manitoba, BC, and Alberta.



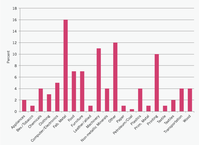
Ontario Manufacturing Sector



- The manufacturing sector currently employs 776,200 Ontarians.
- On average, Ontario employees working in manufacturing make over $60,000 a year.
- There are over 36,000 manufacturing companies in Ontario.
- The sector directly accounts for almost 11 per cent of the province's GDP.
- Manufacturing is responsible for close to 80% of Ontario's outbound goods. The sector's top five export markets are the US, Germany, Mexico, Norway, and China.

Sources: CME; Statistics Canada.

FIGURE 2
Share of firms by type of manufacturing in Ontario, 2011



Top 10 Manufacturing Industries

Sector Maps

Voice of the Employer

FIGURE 6
Ontario Employment by Industry, 2001-2012

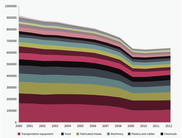
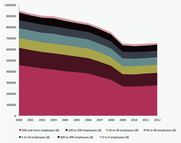


FIGURE 7
Employment in Ontario Manufacturing by Enterprise Size, 2000-2012



IN WHICH SKILLED PRODUCTION OCCUPATIONS DOES YOUR COMPANY FACE THE MOST URGENT HIRING NEEDS?

We have known for some time that manufacturers and businesses in other industries have struggled with finding skilled trade workers. But which specific skilled trades occupations are seeing the largest supply-demand imbalances? According to survey respondents, the occupations that are most challenging to find are industrial mechanics (1,0 per cent), millwrights (1,0 per cent), and machinists and machining and turning inspectors (1,0 per cent). Notably, these occupations also placed in the top three in the 2021 survey.

As the other end of the spectrum, shortages of plumbers, ironworkers, steamfitters and gasfitters, crane operators, boilermakers, and machine fitters appear to be less of an issue, with less than 5 per cent of respondents citing these occupations as trouble spots.

IS YOUR COMPANY CURRENTLY FACING LABOUR SHORTAGES IN ANY OCCUPATIONS?

Labour and skills shortages have been a problem in manufacturing for some time, but the situation became more acute during the pandemic. Some 82 per cent of survey participants said they faced labour shortages in their or skills shortages, the exact same percentage as in the 2021 survey. This figure was 70 per cent in 2019, 60 per cent in 2018, and 50 per cent in 2020.

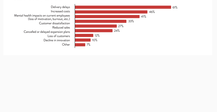
WHAT ARE THE MAIN BARRIERS YOUR COMPANY FACES IN ACQUIRING AND RETAINING A QUALITY WORKFORCE?

Canadian businesses face many barriers to attracting and retaining talent, but which ones are the most prevalent in manufacturing? In our survey, one barrier stood out above the rest: difficulty finding candidates with the right technical skills (cited by 64 per cent of respondents). This underscores the need for education and immigration reforms to better match skills of the country's workforce with the needs of the industry.

Other top barriers included difficulty providing expected compensation (35 per cent), reflecting the growing pressure on companies to increase wages, and the high cost of living at their location (27 per cent), a likely consequence of the high inflation environment in Canada's centre housing crisis.

WHAT ARE THE BIGGEST NEGATIVE IMPACTS OF LABOUR SHORTAGES ON YOUR BUSINESS?

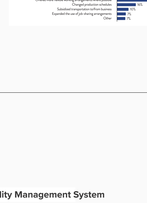
Labour shortages are causing a wide range of negative impacts on the sector. Based on our survey, the biggest ones faced by companies are increasing the workload of existing staff (cited by 84 per cent of respondents), which could have impacts on current employees (87 per cent). The latter impact is particularly worrisome because it tends to compound labour shortages, as work-related stress and poor mental health have been cited as major reasons for absenteeism, occupational disability, and early retirements.



IN THE PAST YEAR, WHICH ACTIONS HAS YOUR COMPANY TAKEN TO ATTRACT AND RETAIN MORE TALENT AND ADDRESS LABOUR AND SKILLS SHORTAGES?

Manufacturers facing labour and skills shortages are trying several different strategies to deal with personnel recruitment and retention challenges. The most common strategy should come as no surprise. More than 70 per cent of survey participants have responded to labour shortages by increasing wages and benefits, consistent with official data showing that wage growth has been the highest in the goods-producing sector.

Other popular strategies that companies are using to cope with labour shortages include devoting more resources to advertising (50 per cent), offering rewards for referrals (44 per cent), and increasing efforts to hire individuals from underrepresented groups – women, Indigenous peoples, persons with disabilities, and visible minorities (41 per cent).

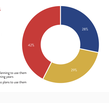


TO WHAT EXTENT ARE LABOUR SHORTAGES IN RELATED SECTORS NEGATIVELY AFFECTING YOUR BUSINESS?

Our survey also highlighted the interconnectedness of supply chains, and how easily they can be disrupted. Indeed, manufacturers depend on supply chains to source inputs and components, and to deliver ready-to-ship finished products to their customers. Along with transportation and logistics, services such as warehousing and wholesale trade are critical and important inputs into the production of goods. It follows that labour shortages in these intermediate sectors could have a negative impact on manufacturers, as manufacturers from existing is potential. In fact, this is exactly what our survey found: 37 per cent of manufacturers said that shortages in related sectors were causing a negative impact on their business, with 4 per cent reporting a major negative effect. In contrast, only 4 per cent of survey participants felt that such shortages were having no impact at all.

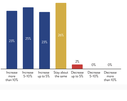
HAS YOUR COMPANY EVER USED GOVERNMENT APPRENTICESHIP PROGRAMS TO HIRE CREWS?

A quarter of the sector's uses of government apprenticeship programs or tax credits draw a mixed response. About 28 per cent said they had used such programs in the past but were not sure if they would use them, and they were planning on using them in the coming years. This left 42 per cent with no such plans to use government apprenticeship supports.



OVER THE NEXT YEAR, WHAT DO YOU EXPECT IN TERMS OF FULL-TIME EMPLOYMENT IN YOUR COMPANY?

Even though the economy is facing headwinds, the manufacturers that have manufacturers remain in hiring mode. Over the next year, 42 per cent of manufacturers they expect full-time employment in their company to increase. Only 13 per cent think full-time employment will increase by more than 10 per cent. In contrast, 13 per cent of survey respondents expect their company's full-time employment to fall.



OVER THE NEXT YEAR WHAT DO YOU EXPECT TO HAPPEN TO PART-TIME WAGES AT YOUR COMPANY?

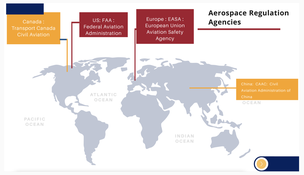
With labour markets so tight, it comes as no surprise that most businesses are planning to make big wage hikes. In fact, over the next year, 42 per cent of manufacturers think wages at their company will rise. Of this group, 30 per cent expect wages to increase by more than 10% (in the figure, not a single respondent expects wages to fall over the next 12 months).

Regulatory Compliance

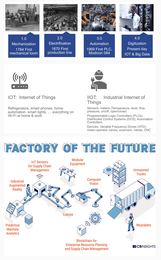
Regulatory Standard

Quality Management System

Regulation Agencies



Technologies & Trends



Augmented & Mixed Reality

Climate Neutral Aviation

The Strong Link Inc.

Shift Operations & Floor Management Systems

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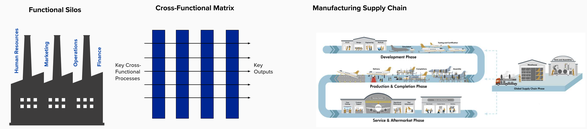
Fundamentals

Organizational Structure



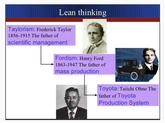
Five Stages of Followership

1. Wait to be told
2. Ask to be told
3. Seek approval for a recommendation
4. Seek approval for action undertaken
5. Get on and inform in a routine way

LEAN Methodology

LEAN Methodology

Evolution of Lean Manufacturing



Lean manufacturing is a production process based on an ideology of **maximizing productivity** while simultaneously **minimizing waste** within a manufacturing operation. The lean principle sees waste is anything that doesn't add value that the customers are willing to pay for.

Operational Excellence

Operational Excellence is the systematic removal of anything that blocks the free flow of value to the customer.

There's no limit on better.

Toyota Production System

A production system based on the philosophy of achieving the complete elimination of all waste in pursuit of the most efficient methods.

8 Waste's of LEAN Manufacturing

he Toyota Production System originally detailed seven wastes that don't provide value to the customer:

- Unnecessary transportation
- Excess inventory
- Unnecessary movement of people, equipment or machinery
- Waiting – either people or idle equipment
- Over-production of a product
- Over-processing unnecessary features to a product
- Defects that require costly correction

An eighth waste has since been highlighted by many lean practitioners:

- Unused talent and ingenuity

LEAN Tools - 5S

Sort, Set in order, Shine, Standardize, Sustain

Gemba - Go Look See

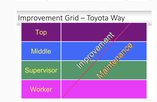
The action of going to see the actual process, understand the work, ask questions, and learn from those who do the work. It is an opportunity for management and support staff to break away from their day-to-day tasks to walk the floor of their workplace to identify wasteful activities.

Kaizen

Kaizen involves workers from all parts of the organization focusing on eliminating waste, improving productivity, and achieving sustained continual improvement in targeted activities and processes of an organization.

Improvement Grid | Toyota Way

Split between Improvement & Maintenance Activities (Ideal State)



Additional Resources

Site Layouts

Bombardier Site

Google Overview

Department Types

Operations | Manages and oversees the day-to-day activities and processes of the business.

Production | Responsible for the manufacturing process of a company's products or services.

Logistics | Feature transportation/delivery, storage, packaging, cargo handling, distribution processing, and information processing.

Quality | Plans, measures, analyzes and reports on quality.

Facilities | Responsible for keeping buildings properly maintained, clean and safe.

Human Resources | Responsible for talent management, compensation and employee benefits, training and development, compliance, and workplace safety.

Health & Safety | Develop, implement and enforce safety rules, regulations, standards and procedures appropriate to the operations of the department

Security | Securing the premises and personnel by staying on patrol, monitoring surveillance equipment, performing building inspections, guarding entry points, and verifying visitors.

Engineering | Responsible for developing innovative devices to bring out advanced materials into the world and designing, introducing, preserving and improving plants for stable and efficient production.

Methods | It connects with lean management techniques so that the company keeps its competitiveness in an evolving market. It is the interface between the production line and the design office

Work Centers

Work Center & Pulse Operations Examples

Floor Management System

Overview of a Floor Management System (FMS)

Communication Zones

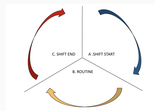
Communication Zones Examples

Com Zone Breakdown

- Safety
- Quality
- Productivity
- Cost
- Human Resources
- Actions

3 Phases to a Shift

Shift Breakdown



A. Shift Start
- Arrive
- Change into work clothes
- Put on Personal Protective Equipment
- FOD (Foreign Object Debris) Walk
- Team Daily Morning Meetings (DMMs)
- No external memory sticks/phones, dependent on security protocols.

B. Routine Stage
- Planned Vs. Unplanned Work
- Clocking Work (Manufacturing Execution Systems - MES).

Kanban PDCA Cycle

OODA Loop Job Breakdown

C. Shift End
- Ensure all paperwork is **stamped and completed.**
- Pass updated to management for handover brief
- Clock off job
- Wash hands and clean surfaces
- Change clothing
- Follow Exit Procedures