MANUFACTURERS' OUTLOOK 2019

GROWTH & UNCERTAINTY

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PLANT ADVANCING CANADIAN MANUFACTURING

IMAGE: ADOBE STOCK

Executive Summary

Canadian manufacturers have a positive view of their prospects in 2019, but their confidence has tumbled since last year amid continuing concerns about US protectionist policies, NAFTA's fate, the Trump administration's impact on the world stage and growing global protectionism.

PLANT's Manufacturers' Outlook 2019 survey conducted from Aug. 1 to Sept. 11 shows uncertain business conditions are affecting the attitudes of senior company executives. Thirty per cent are optimistic, which is down from last year's sample (44%), and most (51%) qualify their optimism with caution. Looking at the next three years, optimism declines markedly to 23% of respondents compared to last year (38%) as caution is registered by 54%. The same is true of Canada's economic growth. Only 11% are optimistic compared to 22% last year. The global view inspires even less confidence (9% optimistic compared to 19% last year).

Sixty-five percent of companies are very concerned about US protectionism, a considerable increase from last year's 54%. Concern about the Trump administration's impact on nation-to-nation relationships is also higher at 61%, compared to 45% in 2018. The NAFTA negotiations were high on the list (56%), although a deal was reached after the survey was closed.

The survey, conducted by RK Insights for **PLANT** Magazine in partnership with sponsors Grant Thornton LLP, SYSPRO Canada and Machines Italia with the Italian Trade Commission, is based on 501 replies from senior manufacturing executives (margin of error of ± 3.6%, 19 times out of 20). Most of the companies (66%) fall into the small business category (under 100 employees); 23% are medium-sized (under 500); and 11% are large (500 or more).

More than half of the senior executives (55%) expect orders to increase an average of 12%, with 60% forecasting sales rising 13%. Pricing will increase for 54% of companies averaging 8%, but fewer (35%) see profits rising (for an 11% gain) compared to last year. Those expecting a decrease (averaging 10%) rose from 21% in 2018 to 31% in 2019. Those expecting costs to climb (by 9%) are way up at 76% compared to 62% in 2018. So no surprise controlling costs tops the list of challenges for 65%, followed by pressures on prices for 61%.

How are companies staying ahead of the risks? Two-thirds (66%) are conducting assessments, 29% regularly and 37% sometimes. Regulatory change leads the list of concerns for 41%.

This year's survey added questions about corporate culture – the values, beliefs and attitudes that characterize a company and guide its practices – as part of a formal business strategy. Most companies (28%) include a formal program and/or policies, 24% have an informal program in place and 23% are working on it, while 26% aren't doing anything.

Top choice for investment over the next three years is machinery, equipment and technology (for 75%), also a key part of growth strategies. The average spend is almost \$1.8 million although most companies (28%) are investing less than \$100,000. Training (63%) is next on the list followed by new software systems (59%). Average investment in upgrading, expanding or building new facilities is almost \$1.7 million.

Companies continue to harvest most of their sales in Canada (67%) and the US (23%), followed by Europe (2.9%) and Mexico (1.9%). Most will focus on North America (26% Canada, 29% US and 12% Mexico) to find new markets. Europe follows at 22%, then Brazil and Central/South America (19%) and China (9%). What's holding them back from increasing their revenues outside North America? Thirty-three per cent say competition, followed by transportation/logistics issues (28%) and trade barriers (26%).

Cyber attacks aimed at industrial targets register as a medium concern for 48% of executives. More than half (57%) haven't experienced an intrusion, but 21% were attacked in the past year. Most (62%) report phishing as the most common breach.

Companies continue to lag in the adoption of advanced measures and technologies that would improve productivity. Only 33% make use of automatic data collection, analysis and review to measure and monitor productivity; 43% do it manually; 8% don't measure; and 13% say it's not applicable.

The top three most used advanced technologies are custom manufacturing (45%), automation (38%) and virtual design, engineering and testing (32%).

In line with last year's survey results, respondents demonstrated limited engagement with the Industrial Internet of Things (IIoT), which connects and optimizes machines via the internet. Only 7% are applying IIoT capabilities, 32% are not familiar with these capabilities and 20% are evaluating its relevance.

More than half of the companies (57%) are focusing innovation efforts on developing products, followed by processes (56%), technology (47%), and services/customer experience (39%). Average spending on innovation will be 3.6% of revenue.

Manufacturers can expect Canada's economy to slow over the next year. The Bank of Canada forecasts growth of about 1.7%, Growth will also slow in the US to around 2% as the benefits of US tax reform wind down and the effects of Trump's trade disturbances register.

Joe Terrett, Editor, **PLANT**

Message from Grant Thornton, LLP

In today's exciting yet uncertain times, **PLANT** Magazine's annual Manufacturers' Outlook survey has never been more relevant. Thanks to the countless companies that took time to offer their opinions and insights, Manufacturers' Outlook 2019 provides our country's manufacturing businesses with information that will help them to brave these uncharted waters. Grant Thornton is incredibly proud to, once again, be a partner in this important endeavour.

As has been the *case* for a number of years, Canadian manufacturers continue to maintain an optimistic view of the future – and this year it's with good reason. From December 2016 to July 2018, manufacturing experienced its fastest growth rate in 20 years. Surprisingly, this growth wasn't the result of automotive expansion efforts, which has typically been the case in the past. Instead, increased demand for Canadian exports was the primary storyline, bolstered by more than 20% growth across countless other industries – including petroleum products, wood products, rail equipment and machinery manufacturing.

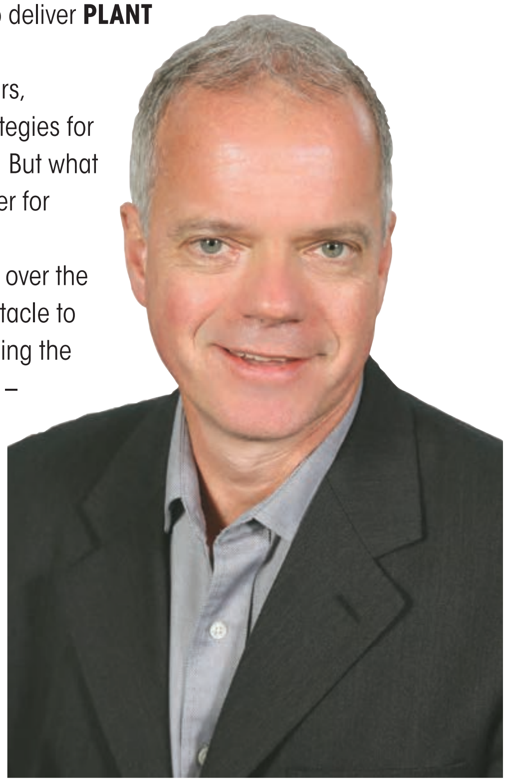
Notably, while growth in exports to the US helped fuel Canadian manufacturing growth, it was actually exports to other areas – including the EU, China, Saudi Arabia and Indonesia – that marked the largest contributors to growth. Although the new United States-Mexico-Canada Agreement (USMCA) may sustain more trade south of the border, it seems Canadian manufacturers have started diversifying globally.

While these signs support manufacturers' optimistic view of the future, there are still risks on the horizon. Aluminum and steel tariffs, as well as the possibility of retaliatory tariffs continue to loom over the manufacturing sector. The fall-out effects of the US-China trade war remain to be seen and global political uncertainty abounds. Closer to home, many manufacturing sectors are struggling with skilled labour shortages. Cybersecurity threats appear to be mounting, with more companies reporting being hacked each year. Higher interest rates, new taxes and regulations are also expected to drive up costs in the not-too-distant future.

All these challenges make it difficult to plan ahead, both in the short and long term. However, Grant Thornton has learned, in our years of serving manufacturers across the country and around the world, that Canadian businesses are up for the challenge. It is true the world is changing fast, however we firmly believe manufacturers have the ability to not only keep pace, but adapt to this new era in more innovative ways. We're honoured to be invited along for the ride.

Robert Riecken
National Leader – Manufacturing & Distribution
Grant Thornton LLP

Message from SYSPRO Canada



SYSPRO Canada is once again proud to partner with Canadian manufacturers to deliver **PLANT** Magazine's annual Manufacturers' Outlook report.

From previous reports and market trends, we know that leading manufacturers, globally, are preparing themselves for Industry 4.0 by developing and deploying strategies for the digitalization of their businesses through automation, machine learning and IIoT. But what does this mean for manufacturers and how can technology become a game-changer for them?

Though the majority of manufacturers plan to invest in technology and innovation over the next three years, a strikingly large percentage of respondents stated the biggest obstacle to deploying IIoT was not knowing where to begin. It starts with awareness, understanding the technology available and how it can integrate into their business to generate results – growth, productivity, profitability – and a competitive edge. The quantifiable value of the investment is essential for ease of adoption and implementation. Early technology adopters are more likely to experience better business outcomes such as increased revenue growth and market position, while those late to capitalize on automation and technology will be restricted from seizing similar opportunities.

Eliminating manual processes and enabling business transformation has profound implications for manufacturers. Those at the forefront of technology have the ability to connect multiple business systems to easily share information in real time and gain insight. They are able to "do more with less," minimize human error and synergize existing resources – human and machine. Manufacturers are then armed with complete visibility into their operations to make informed decisions based on business intelligence. Ultimately, they will maximize efficiency, allow flexibility to react to market changes, reduce operating costs and increase profit margins.

To enable business transformation and future-proof growth, manufacturers must first define what part of their operations or business processes would benefit from digitalization. Any technology or business system that's implemented must be scalable and flexible enough to allow for changes to the business model, the introduction of new processes, or even the adoption of new revenue streams. Those that recognize technology as an opportunity for growth and wholeheartedly embrace it are sure to flourish and prosper.

SYSPRO Canada has more than 40 years of experience helping manufacturers future-proof their businesses by designing solutions that allow them to gain a competitive edge and we look forward to the infinite possibilities that lie ahead.

Paul Ellis
President
SYSPRO Canada

Manufacturers' Outlook **2019**

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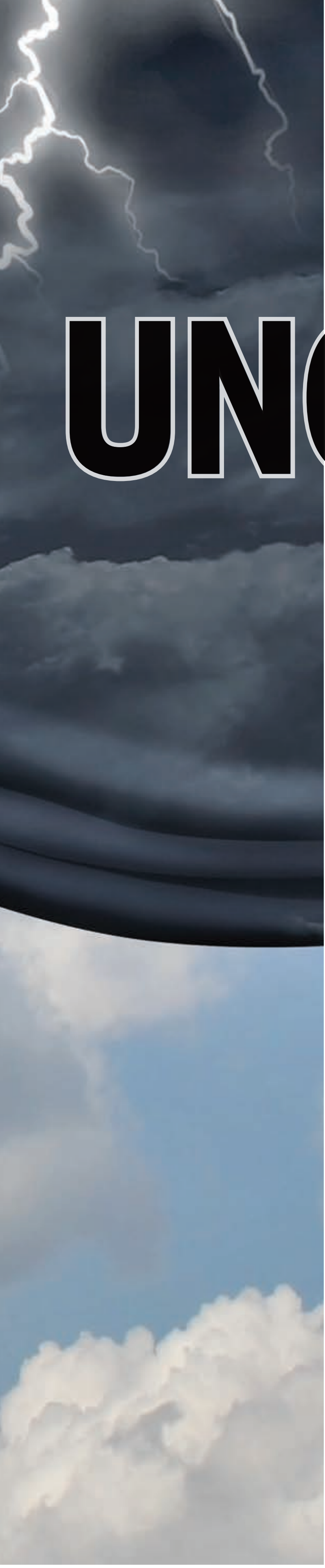


IMAGE: ADOBE STOCK

DEALING WITH UNCERTAINTY

Senior executives are concerned but confident

By Joe Terrett, Editor

Optimism is tempered by trade issues, Trump turbulence and cloudy economic forecasts.

Canadian manufacturers are coming off a 2018 that's best described as a wild ride driven by US protectionist policies, tariffs and retribution, disturbing international trade issues, inflammatory Trumpster tweets, a tough NAFTA renegotiation and a shock to the automotive industry with the announced closing of General Motors' Oshawa, Ont. assembly plant.

Much of the discord and upset emanates from the US, Canada's closest "friend" and ally, which put the relationship to the test throughout the year. The Trump administration's chaotic agenda included a tweaking of the three-country North America Free Trade Agreement that turned into a 13-month ordeal. To move things along and boost US domestic aluminum and steel producers, Trump slapped tariffs on incoming steel (25%) and aluminum (10%) from friends and other nations, doing so by invoking national security concerns under Section 232 of the Trade Expansion Act of 1962. Prime Minister Justin Trudeau, who publicly criticized Trump's move following a G7 meeting in June, viewed this use of the act darkly. Canada retaliated by imposing counter measures against $16.6 billion of US steel and aluminum, plus other goods.

Export Development Canada (EDC) reported more than a third of Canadian exporters have been negatively affected by the imposition of tariffs, with 19% raising prices and 18% finding alternate markets and suppliers. Adding to the potential chaos is the economic threat posed by the US-China trade spat. Bank of Canada governor Stephen Poloz warned an all-out trade war could lead to 1970s-style stagflation that would threaten the inflation-fighting efforts of the world's central banks. Efforts by the world's two largest economies to diffuse the trade tension have been ongoing.

Yet despite all this uncertainty and change, the 501 owners and senior executives of mostly small companies (less than 100 employees) who responded to the **PLANT** Manufacturers' Outlook 2019 survey look at the year ahead with confidence, although at a significantly diminished level since last year. And they have concerns.

RK Insights conducted the survey for **PLANT**, in partnership with sponsors Grant Thornton LLP, an accounting, tax and advisory

2019 Manufacturers' Outlook Roundtable Panel

Front (seated): James Johnson, Julie Ibrahim (observer, media relations manager, Grant Thornton LLP), Dale Kehler. Back (L-R): Steve Loftus, Greg Gale, Craig Mannell, Jim Menzies, (seated) Jayson Myers, Theo Argitis (observer, Ottawa bureau chief, Bloomberg News), Shawn Casemore, Kevin Merritt (seated), David Sherman, Ben Whitney (seated), Kip Daechsel.

PANEL PHOTOS: STEPHEN UHRANEY

firm; SYSPRO Canada, a provider of ERP software and services; and Machines Italia and the Italian Trade Commission. The margin of error is +/- 3.6%, 19 times out of 20.

Most of the companies (89%) are SMEs, of which 37% have 24 or fewer employees, and 36% are forecasting 2019 revenues of up to $5 million. Average revenue for the survey sample is $68.2 million. Most (64%) are privately owned, and 21% of those firms are family owned, or partnerships (4%), and 11% are publicly owned. Of the companies spread across Canada, more than half (52%) come from Ontario, 25% from the West, 17% from Quebec and more than 5% from Atlantic Canada.

How confident are the companies surveyed? Many senior executives (30%) are optimistic about business prospects, but 51% are more cautious about their outlook. And optimism declines as caution increases the farther out they look. Their view over the next three years shows 23% are optimistic, 54% are cautiously optimistic and 22% are concerned.

Executives are much less confident about the Canadian economy over the same period. The Bank of Canada pegged modest GDP growth of 2% for

Shawn Casemore
President
Excellence in Manufacturing Consortium, Owen Sound, Ont.
Non-profit manufacturing consortium that helps manufacturers become more competitive.

Kip Daechsel
Partner
Dentons Canada LLP, Toronto
Canadian operations of the multi-national law firm.

Greg Gale
President
David W. Wilson Manufacturing, Cathcart, Ont.
Manufactures custom parts and assemblies for a range of applications including materials handling, refrigeration components and prototypes.

James Johnson
Senior trade analyst, project manager
Italian Trade Commission, Machines Italia, Toronto
Representing 16 Italian machine manufacturing associations covering more than 10,000 companies. Manufacturers' Outlook sponsor.

Dale Kehler
Vice-president, product services
SYSPRO Canada, Mississauga, Ont.
Provides ERP software and services. Manufacturers' Outlook sponsor.

Steve Loftus
President
Innovative Automation Inc., Barrie, Ont.
Provides custom automation solutions to manufacturers in a range of industries.

Craig Mannell
Manufacturing executive, **Caledonia, Ont.**
Manufacturing executive EMC member, filled a variety of manufacturing roles, most recently as a vice-president of operations for a manufacturer of lockers.

Jim Menzies
Ontario Manufacturing Industry Leader
Grant Thornton LLP, Southern, Ont.
Accounting, tax and advisory firm. Manufacturers' Outlook sponsor.

Kevin Merritt
President
Superior Radiant Products, Stoney Creek, Ont.
Designs and manufactures energy-efficient infrared heating solutions for industrial, commercial, agricultural and residential applications worldwide.

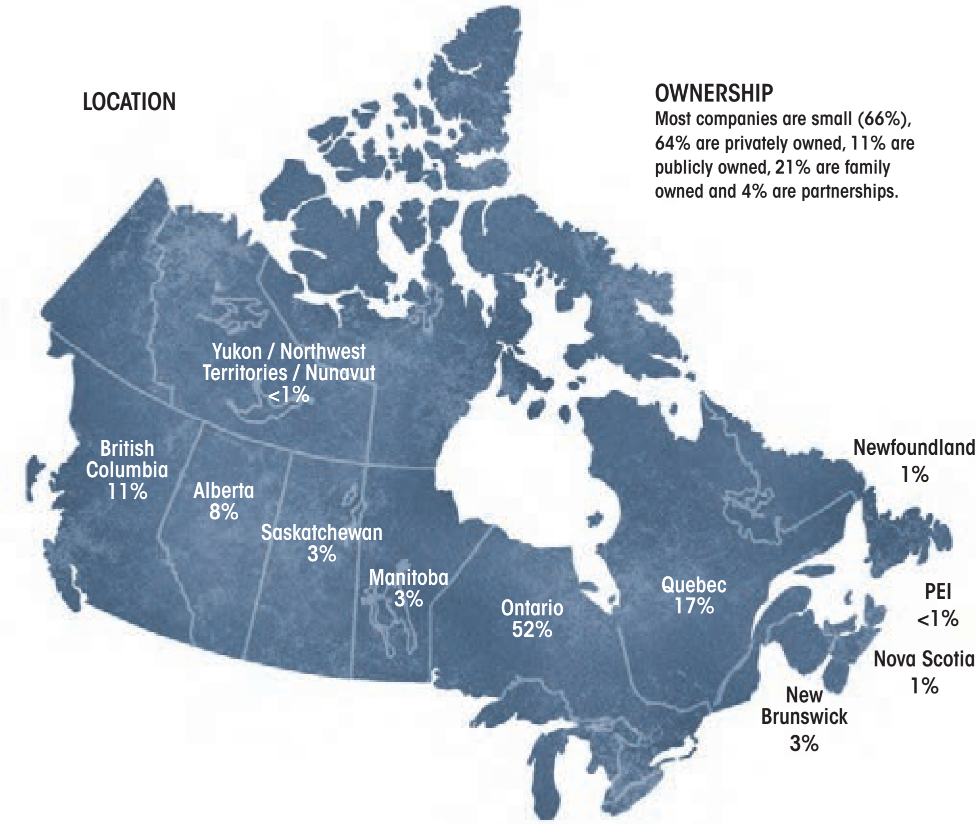
Jayson Myers
CEO
Next Generation Manufacturing Canada, Hamilton, Ont.
A not-for-profit organization that matches companies with new technologies to drive advanced manufacturing in Canada.

David Sherman
Country Manager
Hobart Food Equipment Group Canada, Toronto
Provides equipment for the foodservice industry, including cooking, food machines, warewashers and refrigeration.

Ben Whitney
President
Armo-Tool Ltd. and Abuma Manufacturing, London, Ont.
Manufactures stamping dies, precision tooling and provides custom automation solutions.

Demographics

LOCATION



OWNERSHIP

Most companies are small (66%), 64% are privately owned, 11% are publicly owned, 21% are family owned and 4% are partnerships.

SECTORS SERVED

Industry	Per cent
Fabricated metal products	**24%**
Printing and related support activities	**15%**
Plastics and rubber products	**15%**
Miscellaneous manufacturing	**15%**
Machinery	**14%**
Wood products	**13%**
Automotive products, parts, components, systems	**12%**
Food and beverage	**10%**
Computer and electronic products	**9%**
Electrical equipment, appliances and components	**9%**
Primary metal	**7%**
Paper manufacturing	**6%**
Petroleum and coal products	**6%**
Aerospace products, parts, components, systems	**6%**
Chemicals	**4%**
Furniture and related products	**4%**
Other transportation, related equipment	**3%**
Durable goods industries	**3%**
Textiles	**2%**
Non-metallic mineral products	**2%**
Railroad rolling stock	**2%**
Ship and boat building	**2%**
Clothing	**1%**
Leather and allied products	**1%**
Non-durable goods industries	**1%**
Tobacco products	**0%**
Other – single mentions	**13%**

REVENUE	2017	2018	Forecast 2019
Up to $5 M	46%	42%	36%
$5 to $9 M	12%	15%	17%
$10 to $24 M	18%	18%	18%
$25 to $49 M	11%	11%	12%
$50 to $99 M	5%	6%	8%
$100 to $249 M	4%	4%	5%
$250 to $499 M	1%	2%	1%
$500 to $749 M	1%	1%	1%
$750 to $999 M	0.3%	0.3%	1%
$1 Billion or more	2%	2%	2%
Average	$57.7M	$62.2M	$68.2M

NUMBER OF EMPLOYEES

1 – 24	**37%**
25 – 49	**14%**
50 – 99	**15%**
100 – 199	**13%**
200 – 499	**10%**
500 – 999	**4%**
1,000 or more	**7%**
Average	**193**

TOP: FOTOLIA

2018, while other economists aimed somewhere north of that, but the central bank forecasts just 1.7% in 2019. The US outlook is 2.1% compared to a global outlook of 2.9%.

Executives are concerned about uncertainties affecting global trade flows, largely the result of protectionism and other policies south of the border.

Only 11% are optimistic about the Canadian economy over three years, compared to 22% last year, 41% are cautious (compared to 66% last year) and 45% are concerned. How they see the world economy is even less optimistic (at 9%) compared to 45% taking the cautious view and 42% registering concern.

Yet the optimists have a positive view of business the year ahead. More than half (55%) forecast orders increasing by an average 12%, and 60% predict sales will be 13% higher. Fifty-four per cent expect prices to increase 8% and 76% predict costs will increase 9% while 35% see profits rising 11%.

Confident but cautious

The survey drew 12 panellists representing manufacturers, industry analysts and providers of services, to **PLANT**'s offices in Toronto on Oct. 24 as part of the 2019 Outlook roundtable, where they shared views on the results and the challenges manufacturers face in the marketplace.

Their mood going into 2019 was generally upbeat.

"I'm an entrepreneur, so I'm cautiously optimistic all the time," said Kevin Merritt, president of Superior Radiant Products (SRP). The company manufactures energy-efficient radiant heating products in Stoney Creek, Ont. "We're always looking for new markets. We did engage a UK partner this year, so we're exporting there."

Although acknowledging there's risk in Europe, he sees big

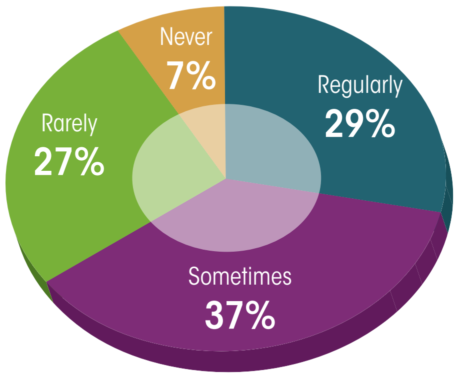
"I'm an entrepreneur, so I'm cautiously optimistic all the time. We're always looking for new markets…"

— Kevin Merritt

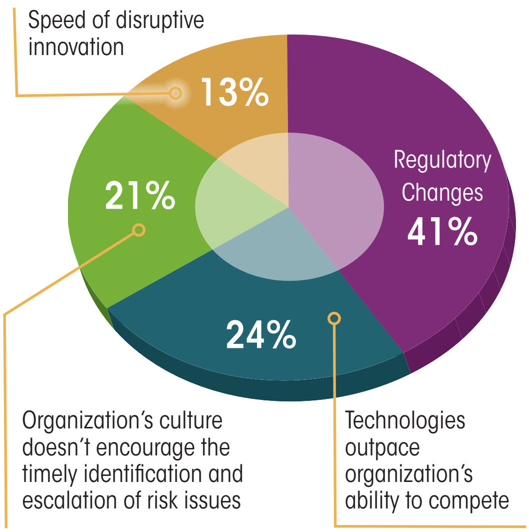
Business Outlook

BUSINESS CONFIDENCE	Optimistic	Cautiously Optimistic	Concerned	Not Optimistic
Business prospects for 2019	30%	51%	18%	1%
Business prospects over the next three years	23%	54%	22%	2%
Canada's economic growth next three years	11%	41%	45%	3%
Global economic growth next three years	9%	45%	42%	4%

RISK ASSESSMENT



RISK CONCERNS



ISSUES OF CONCERN

	Very concerned	Somewhat concerned	Not concerned
US protectionist policies	65%	31%	5%
US/Trump administration's impact nation-to-nation relationships	61%	34%	5%
Changes involving NAFTA	56%	38%	6%
Rising global protectionism	40%	52%	8%
Cybersecurity threats	34%	51%	15%
Costs of climate change measures	27%	54%	20%
Technology integration	9%	54%	37%

ENTERING NEW MARKETS OVER THE NEXT THREE YEARS

United States	13%
Canada	12%
Other Central/South America	7%
Brazil	5%
China	5%
Central/Eastern Europe	5%
Mexico	4%
Western Europe	4%
Japan	3%
Korea	3%
India	3%
Australia/New Zealand	3%
Other	3%
Not applicable	30%

REVENUE BY COUNTRY

Canada	67%
United States	23%
Western Europe	2%
Mexico	1.9%
China	1.3%
Other	1%
Central/Eastern Europe	0.9%
Other Central/South America	0.9%
Japan	0.7%
Australia/New Zealand	0.6%
Brazil	0.3%
India	0.2%
Korea	0.1%

SKILLS GAPS

- 49% General labour
- 36% Production/production support
- 32% Sales/marketing/customer support
- 23% Engineering
- 23% Management
- 18% R&D
- 13% IT/cybersecurity
- 10% Digital/social media
- 7% Other
- 8% Not applicable

BUSINESS GROWTH	Increase	%	Decrease	%	Overall % Change	Remain the Same
Orders	55%	12%	11%	15%	8%	35%
Sales ($)	60%	13%	12%	15%	8%	29%
Your pricing	54%	8%	10%	8%	6%	36%
Profits	35%	11%	31%	10%	1%	34%
Costs	76%	9%	6%	7%	8%	18%

opportunities. "We're looking at Germany, Poland, Austria and Spain. I think diversification is really, really important in manufacturing."

The NAFTA renegotiation was resolved after the Outlook survey was pulled from the field in September. At that time, 94% of respondents were either very or somewhat concerned about the outcome. US protectionism worried 96% of executives, followed by Trump's impact on nation-to-nation relationships (95%) and rising global protectionism (92%).

Companies continue to derive most of their revenue from North America: 67% comes from Canada, 23% from the US and 1.9% from Mexico, while Europe accounts for 2.9%, and China 1.3%, with other markets accounting for the rest. Looking ahead three years, North America is still the preferred region for market expansion (13% to the US and 12% to new markets in Canada), followed by Brazil and Other Central and South America (12%), Europe (9%), Mexico (4%) and China (5%).

What's holding them back from expanding their exports beyond North America? Thirty-three per cent identified competition, followed by transportation and logistics issues (28%), trade barriers and protectionism (26%), finding international partners (24%), difficulty identifying opportunities (21%), a lack of internal resources (20%) and currency fluctuations (19%).

Looking ahead, there are risks that will impact some manufacturers, said Jayson Myers in his economic summary for the roundtable (see *Economic forecast: cloudy*). Myers is an economist and CEO of Next Generation Manufacturing Canada (NGen), based in Hamilton. He's also the former president and CEO of Canadian Manufacturers & Exporters (CME). Among those risks are the steel and aluminum tariffs, as well as the subsequent retaliatory moves.

Trump tariffs

Tariffs are affecting members of the Excellence in Manufacturing Consortium (EMC) directly and indirectly, said Shawn Casemore, president of the non-profit group based in Owen Sound, Ont. It's aim is to help manufacturers become more competitive. "Although some have found ways to mitigate the impact, it's still an additional cost and it has been very difficult for many of our members to function."

It's not just about direct costs related to tariffs, either. Casemore, noting the shortage of manufacturing talent across the country, cited an increased demand for automation. But that kind of investment requires money.

"We need increased profitability to drive the investment. The survey results show that with additional tariffs and other regulatory changes, profits are down. Many of our members are experiencing increased volume, but as the survey suggests, they're cautiously optimistic about what that will lead to, because in the longer term, the impact of reduced profitability affects their ability to invest in automation and then you run

[USMCA] is out there. Months later I still have no clear indication of when [the tariffs] are going to go away, or if they're going away…

— Greg Gale

Business Outlook

CHALLENGES OVER THE NEXT THREE YEARS	
Controlling/reducing costs	**65%**
Pressures on pricing	**61%**
Filling skills needs, management talent	**46%**
Value of the Canadian dollar	**45%**
Improving productivity	**41%**
Economic conditions	**40%**
Increasing sales/orders	**36%**
Investing in new machinery, equipment, technology	**36%**
Gaining market share	**35%**
Developing new products	**32%**
Technology adoption	**31%**
Government red tape, associated costs	**29%**
Disruption in your industry sector	**27%**
Production capacity	**27%**
Environmental regulations/costs	**25%**
Entering new export markets	**20%**
Accessing existing markets	**18%**
Access to credit/financing	**11%**

CONSTRAINTS INCREASING REVENUE BEYOND NA

Competition	33%
Transportation/logistics issues	28%
Trade barriers: protectionism/tariffs	26%
Finding international partners	24%
Difficulty identifying opportunities	21%
Lack of internal resources/expertise	20%
Currency fluctuations	19%
Government policies	16%
Lack of market demand	14%
Managing risk	14%
Global sourcing/supplier issues	12%
Growing opposition to global trade	9%
Other	7%
Not applicable/no constraints	24%

GROWTH STRATEGY FOR NEXT THREE YEARS

Invest in machinery, equipment, technology	51%
Innovation (products, processes, technology, management)	47%
Introducing new products	47%
Sell more to current customers	42%
Scale up operations	35%
Hire employees	32%
Expand sales and distribution channels	28%
Mergers and acquisitions	26%
Collaborations, strategic alliances, joint-ventures, and/or partnerships	24%
Strengthen supply chain links and relationships	24%
Focus on opportunities in North America	22%
Business model transformation	21%
Diversify industries served	17%
Sell more to adjacent markets	17%
Enter new export markets	14%
Online channels, use of social media	14%
Other	2%

out of options."

David W. Wilson Manufacturing in Cathcart, Ont. is paying "quite a high price" every four or five weeks for weld wire that's sourced from the US because Canada doesn't produce it, said Greg Gale, president of the company that makes parts and assemblies for a range of applications, including material handling, refrigeration components and prototypes. "There's a cost to that, it's a problem for us and there's no clear direction from anybody of when it's going to change."

That's in spite of the USMCA agreement replacing NAFTA, poised for approval by the US Congress (or not, depending on how it's received by a new House of Representatives), with the steel and aluminum tariffs still in place. "That's what's costing me money," Gale said. "[USMCA] is out there. Months later I still have no clear indication of when [the tariffs] are going to go away, or if they're going away. We're becoming more uncompetitive because we're fighting US corporate tax breaks while we've got all of these rising costs; plus the lack of certainty and being able to plan because I don't know what my competitiveness will be three months from now, or six months from now based on all these factors. Yes, we're planning to grow, but it's a lot more challenging to do so in these conditions."

Ben Whitney, president of Armo-Tool Ltd., a manufacturer of stamping dies, precision tooling and custom automation solutions in London, Ont., mostly buys steel through local distributors. Much of the metal originates in Canada where he said everyone raised prices 25% to 30%. Steel could also originate from Europe or China, where suppliers do likewise. "So I'm paying a lot more for steel even though the money isn't going into the tariff pool that the government is collecting."

Gale chimed in that Canadian mills were taking advantage of the tariffs by slapping on a 20% surcharge "for no reason other than they can, knowing that we're paying 25% to get it across the border. To me, that's just pure greed and that's going to hurt the industries, as well."

A tariff on steel is a big issue for Merritt. It's not just the price going up, it's availability of good metal.

"We're having a real tough time. We did get a supply source out of China through a local firm. We started bending it, and it was cracking, although it was supposed to be at H14."

The company is risk managing its inventory. "We were looking at single source inventory and stocking up. We've had to increase inventory a lot because we're trying to take the risk out of the supply chain. In the heating business, we get three or four months where we make all this money and then it kind of dies off. So you've got a pile up of inventory going into that period."

Supply chains are affected by various factors. SRP's supply chain is driven by China, Canada and the US. Some components come directly from China, so SRP isn't hit with tariffs. But some electrical components from American suppliers are tariffed coming into the US. Those suppliers don't get duty drawback when they export so there's a potential for double duty. "They're adding it into their price to bring it into the US. When it's coming into Canada there's a risk it's going to get tariffed again. We're watching to see how that plays out."

Hobart Food Equipment Group Canada is using the right kind of metal, said country manager David Sherman, who is based in Toronto. "We're using stainless steel, so we're somewhat insulated from what's happening. We're getting hit on a component level, where there's a combination of elements…but we're lucky enough to be in an industry where we have a very high likelihood of being able to pass those costs along almost instantly."

So I'm paying a lot more for steel even though the money isn't going into the tariff pool that the government is collecting…

— Ben Whitney

Prepare for stormy weather. IMAGE: ADOBE STOCK

Economy

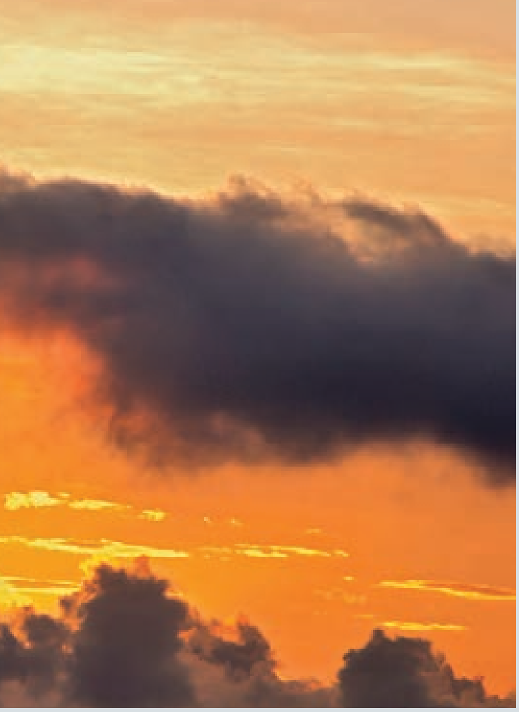
Business forecast: CLOUDY

Look for risks impacting costs, price

Canada is coming off a year and a half of strong economic growth, but what comes next?

Jayson Myers, an economist and CEO of Next Generation Manufacturing Canada, the not-for-profit organization managing Canada's advanced manufacturing supercluster, provided panellists participating in the **PLANT** Manufacturers' Outlook 2019 roundtable with an overview of what to expect looking ahead. And putting it in terms of a weather report, the forecast would be unsettled with a chance of thundershowers.

From the end of 2016 to last July, growth in current and constant dollar sales value was strong. This is the fastest growth rate in 20 years, with shipments up about 10%, mostly driven by



export growth and sales going to domestic customers in the first half of 2018.

Myers compared value-added (combined labour and profits) versus shipments and how it relates to growth. "When value-added increases more rapidly than constant dollar shipments, it means there's less cost pressure than pricing leverage…So the last couple of years have been very profitable for manufacturers."

Of interest, though, are sectors that have not grown rapidly over the last 20 years showing increases, while some sectors that have shown very strong growth have declined, especially since the recession. And all of this growth has nothing to do with the auto sector. Its shipments, although robust, fell over the last year and a half.

One area in the transportation equipment sector showing strength is rail cars and train engines. Other areas showing strength were fabricated metal products, petroleum products (a lot of that was price increase) plus wood and metal products feeding into the construction boom in the US and Canada. Primary metals were already experiencing cost and pricing pressures before the Trump Administration's aluminum and steel tariffs went into effect.

US markets will continue to be fairly strong thanks to lower taxes and deregulation. Protectionism is hurting manufacturers but also creating much more investment. The US manufacturing sector is doing well, and that's creating a need for sales from Canada.

Myers noted some diversification of exports, although in some "fairly risky economies." The strongest export growth came from Europe, China, Hong Kong, Saudi Arabia and Indonesia, which Myers sees as diversification, although in risky markets. "Growth rates in all of these markets are about two to three times the rate of growth into the US. But as the Outlook survey shows, exports to these other markets are relatively small. The US is our major export market."

Looking ahead, risk factors include the impact of aluminum and steel tariffs, as well as retaliatory moves, which impact cost and pricing here, global markets and global trade trends. There will also be fallout effects coming from the US-China trade war.

On the finance side, he cited high levels of debt and higher interest rates in all major economies. Canada has "extremely high" levels of consumer household debt. Government and business debt is not too bad, but both are at record levels in Europe and the US. He cautioned central banks will be watching inflationary pressures and pushing up interest rates. That will slow borrowing from consumers, businesses and governments as more of their incomes will be spent on debt service. The result will be less money for goods and services, which is generally bad news for manufacturing.

If there's another major financial crisis, he warned governments won't have very much in their toolboxes to re-stimulate the economy. "Interest rates are already low (holding at 1.75%). There's a lot of liquidity in the marketplace and everybody is over-indebted. There isn't a lot more we could do in fiscal policy without major increases yet again in rates of debt," he said (not that it's going to happen, but it's more of a risk).

Deteriorating economic prospects in Europe, China and emerging markets, combined with political uncertainty in the US doesn't help. "How do questions about trade policy and tariffs work into the stability of institutions that underlie international trade and investment and finance? I think that is a major institutional risk the world economy is facing."

On top of it all, there are ongoing skilled labour shortages, and he said the outlook is for further cost increases, market- or policy-driven, in terms of taxes and regulatory compliance.

Resolution of the USMCA does help calm some concerns, but the big question is whether that's going to be ratified in the next US Congress.

"If we do see the elimination of tariffs between Canada and US, that will also help considerably over the year ahead. I think we will still have a strong US economy going into 2019, and capacity limitations of US manufacturing all create demand for Canadian products," Myers said.

A lot of investment in Canadian manufacturing is driven by a strong financial performance that began in 2018. "All of that is good news and should help to strengthen competitiveness going forward," Myers said. "The big question is whether that's going to continue into 2019 given concerns around profitability because it's really the after-tax cash flow that drives investment either in innovation or in machinery and equipment."

But higher rates of investment is key, he said. "This will be very important in maintaining and improving the competitive position of manufacturers, and to increase export market diversification."

> *It's the scale that makes a big difference in terms of productivity, in terms of capital investment. The bigger you are, the more you invest…*
>
> *— Jayson Myers*

Investing priorities

Survey responses point to some vigour among companies that intend to invest in their businesses. Strategically, machinery, equipment and technology top the list for 51%, followed by innovation (47%), introducing new products (47%) and selling more to current customers (42%).

Investment priorities are machinery, equipment and technology for 75%, training (63%), new software systems (59%), R&D (42%) and productivity projects (35%). Twenty-eight per cent of companies investing in machinery, equipment and technology over the next three years are spending up to $99,000 while 22% are spending $100,000 to $499,000. Average spending for all companies is more than $1.7 million.

There will be no spending on expanding, upgrading or building new facilities for 34% of respondents, but 28% will invest up to $100,000 and 18% plan to spend $100,000 to $499,000. Twenty-nine per cent said investment isn't necessary but 26% will not be doing so because of the costs, and 23% are cautious about uncertainty and risk. Most companies (70%) continue to rely on internally generated cash flow for financing, followed by banks (32%), private investors (16%) and government programs (15%).

Innovation efforts are prioritized as products (57%), processes (56%), technology (47%) and customer experience (39%).

Average investment in R&D for 2019 will be 3.6% of revenue with most (35%) spending 1% to 3%, 20% spending 4% to 6% and 13% spending 7% to 10%. Four per cent are spending more than 10% of revenues. Eighteen per cent are unsure what they'll be spending.

As of 2014, the federal government reduced the benefits available from the Scientific Research And Experimental Development (SR&ED) tax credit and made the program more difficult to access.

Almost half (49%) of the respondents don't plan to make use of the tax credit, but 29% will use it in 2019. When asked what would make innovation easier, 42% said higher SR&ED tax credit rates, easier eligibility, increased government funding (40%), direct support for innovation through government grants (35%) and lower rates on income directly generated from innovation activities (35%).

Fifty-four per cent of companies will collaborate with suppliers, clients (42%), parent or affiliated subsidiary businesses (30%), and universities and colleges (24%).

Myers sees the investment issue as less related to cash or new technology and more to do with the scale of companies. There are 270 manufacturing establishments in this country that employ more than 500 people; in the US, there are 33,000.

"It's the scale that makes a big difference in terms of productivity and capital investment. The bigger you are, the more you invest," Myers said.

Sure, the macro economic views paint a gloomy picture of Canadian investment and productivity, but he said a lot of that comes from the loss of large companies, like Nortel, that were major investors.

Comparing average income statements between Canada and the US, he said Canadian companies are more profitable. And the rate of investment in new technology is exactly the same as the US in terms of how much is being invested from after-tax cash flow. Looking at after-tax profit plus depreciation and amortization, it's 23.3% in the US, and 23.4% in Canada, which has been fairly consistent over the last 15 years.

"It tells me smaller manufacturers do a pretty good job of being flexible, customizing, and being much more specialized while creating value for customers. That's what generates the profit."

Controlling and reducing costs over the next three years continue to be the chief challenges identified by 65% of manufacturers, followed by pressures on pricing (61%), filling skills and management needs (46%), value of the loonie (45%) and improving productivity (41%).

Skills challenge

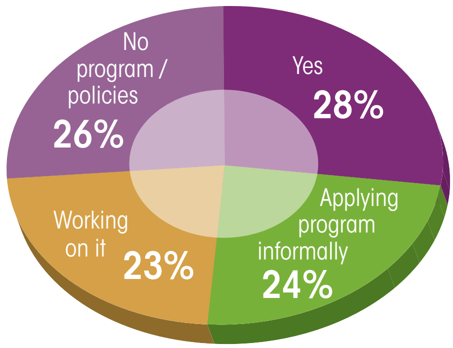
The greatest skills gaps continue to be in general labour (49%), production and support (36%), sales/marketing/customer

Corporate Culture

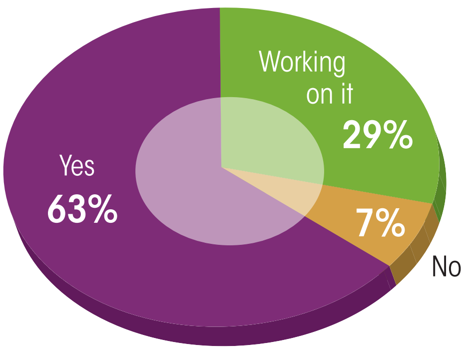
MEASURES IN PLACE – 255 replies

81%	Skills training
50%	Recognition program
49%	Health oriented programs
42%	Flexible work program
39%	Corporate social responsibility initiatives
32%	Benchmarking program (Great Place to Work Canada)
32%	Robust benefits
4%	Other

FORMALIZED PROGRAM OR POLICIES – 497 replies



PROMOTE DIVERSITY / INCLUSION



KEY BENEFITS – 136 replies

88%	Retention of current staff
78%	Employees work better together
66%	Improved productivity
58%	Attraction of highest calibre staff
51%	Production, business efficiencies
38%	Appeal for customers
35%	Increases profits
2%	Other (specify)

support (32%) and engineering (23%).

Having the right skills on board is crucial for Innovative Automation Inc., a manufacturer of custom automation systems in Barrie, Ont.

President Steve Loftus said the company is almost three times the size it was in 2014, and he credited this growth to "a fairly well-planned global assault."

About 70% of the company's goods sold are labour, with a lot of added Canadian value.

"We have a very highly skilled workforce. We made the decision probably 25 years ago to stop the cherry picking – shall we say, stealing from our neighbours – and put in really strong training plans for recent grads. Last summer, we actually had 19 engineering and business students working at our facility."

The plan is to hire 10 graduates. "We have broken down all of our tasks within the company, so they can be productive from day one, and generate profits for our company based on the pay scale and the tasks they're given."

Training covers three to five years, depending on the job. This has allowed the company to accelerate its growth. "Twenty-seven per cent of our staff is under the age of 25; 42% under the age of 30," Loftus said.

The skill level of employees has increased substantially. "Now, unless you have a college diploma in some type of engineering, you're not building machinery at all. So, three years of college is kind of the starting point. The design group is now pretty much all engineering grads with degrees. It's given us a huge competitive advantage."

Casemore observed many EMC members say college and university curriculums are out of date and in many cases it takes too long to get people up to speed.

For example, EMC members in the Northern Ontario region need machinists. But he said the machinist course puts students on a lathe. "Today companies are using CNC machines, and to use one, you need to understand how to program the machine. There's nothing in the skilled trades course around programming."

He expressed surprise at how many kids in high school want a skilled trade, "but we can't get them through the system fast enough. And then the onus falls back on the manufacturer to provide a lot of training that the course itself won't cover."

Whitney said 85% of the people enrolled in the Fanshawe College program are students from India; the rest come from southwestern Ontario. "My advice would be get really good at recruiting and hiring new immigrants, because that's what the colleges are graduating. Then wrap your head around taking somebody who's smart, has potential but really doesn't know anything about your business, and get them started."

Innovative Automation sits on college advisory committees. "We steer what we want out of them, and then we take that piece of the puzzle and we put the rest of the pieces around it. We're in Barrie, so we're hiring out of Georgian College."

Someone that has come from a CNC course will be taught basic machining and they'll go through a standard apprenticeship. "Then we'll add the feed rates, the material selections – all of those types of skills. The investment for some of these people is two years. Other people, it's four. If we benchmark four and we get someone that's through the program in two years, it's a bonus."

He emphasized the need to manage expectations. When hiring someone out of school, don't expect them to fit in right away. "You need to have training models that fit each and every employee when they start, and then, particularly for young people, if you give them clear, concise objectives, they're more than willing to hit them."

The company's human resources department focuses on people who are goal-driven. "If they have a goal that's a year from now, most of the people are hitting it in six months, because they want to succeed. They know what comes with the success because that's compensation."

Every group leader or team has a responsibility to have a training plan in place for every employee, they need to communicate that to them, and it's reviewed every six months, Loftus said. "There's a lot of work from an HR perspective to make these people succeed, but the payoff is much greater than the effort put into it."

Craig Mannell, an EMC member and a manufacturing executive between assignments, noted the importance of the cultural component as it relates to retaining skilled employees. "If you provide a better culture, you tend to get happier employees who stay longer."

What's a better culture? Understanding what people want and knowing that it shifts, he said. It used to be about money. Now people are looking for flexibility and fulfilment. Or Fridays off. "So everybody knows you work nine and a half hours a day. That culture means, 'Hey, fantastic! I want to work there. I get a three-day weekend.' Those styles seem to help keep people happy."

Merritt believes there's more of a gap than a skills shortage, especially involving welders, brake press operators and assemblers because students are graduating at a much higher level. "They don't want to work in those jobs."

The HVAC technician is an area he described as suffering. "Technicians are getting older but there are fewer people moving up to replace them, because it's just not a glamorous job."

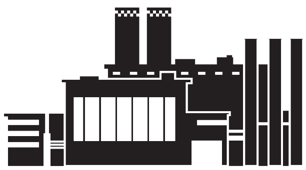
He also emphasized the importance of internal training. Technology is evolving quickly. Machines talk to each other.

Investment

INVESTMENT PLANS OVER THREE YEARS	
75%	Machinery, equipment, technology
63%	Training
59%	New software systems
42%	Research and development
35%	Productivity projects
31%	Upgraded, new plant facilities
16%	Business intelligence, data analysis systems
14%	Digital transformation
10%	Modular or flexible production systems allowing greater customization
10%	Sustainability, reduce carbon footprint
6%	IP acquired from other sources
6%	No investments planned

FINANCE NEXT THREE YEARS	
70%	Internally-generated cash flow
32%	Bank financing
16%	Private investors (owner, family, etc.)
15%	Government programs
14%	Asset-based financing
10%	BDC
9%	Not applicable
7%	Leasing
7%	Private equity
6%	EDC
2%	Public offering
0%	Subordinated/mezzanine debt
1%	Other

NEW MACHINERY, EQUIPMENT, TECHNOLOGY	2017	2018	2019
Up to $99,999	30%	31%	28%
$100,000 to $499,999	28%	24%	22%
$500,000 to $999,999	8%	9%	12%
$1,000,000 to $4,999,999	8%	10%	12%
$5,000,000 to $9,999,999	2%	3%	2%
$10,000,000 to $19,999,999	1%	1%	2%
$20,000,000 or more	2%	2%	2%
No significant investment	22%	19%	19%
Total Mean Investment, (excluding 0)	**$1,482,692**	**$ 1,589,814**	**$ 1,774,073**



PLANT EXPANSION, UPGRADES, NEW FACILITIES	2017	2018	2019
Up to $99,999	33%	30%	28%
$100,000 to $499,999	16%	20%	18%
$500,000 to $999,999	5%	3%	8%
$1,000,000 to $4,999,999	5%	7%	7%
$5,000,000 to $9,999,999	0%	2%	2%
$10,000,000 to $19,999,999	0%	0%	1%
$20,000,000 or more	3%	2%	2%
No significant investment	37%	36%	34%
Total Mean Investment (excluding 0)	**$1,484,523**	**$1,429,687**	**$1,659,090**

REASONS FOR NOT INVESTING IN MACHINERY ETC.	
29%	Investment not necessary for continuing operations
26%	Too costly
23%	Uncertainty and risk
18%	Not convinced of economic benefit
16%	Lack of internal cash flow
16%	Shortage of qualified staff
16%	Recently completed significant investments
14%	Weak customer /market demand
13%	Depreciation of the Canadian dollar
11%	Decisions made by others
9%	Lack of skills to support investment
8%	Too much disruption
8%	Lack of external financing
8%	Government policies
8%	Excess production capacity
7%	Difficulties integrating advanced technologies in existing systems
4%	Organizational structure/culture too inflexible
3%	Lack of support or services from external vendors/partners
1%	Intellectual property protection
1%	Lack of adequate information about advanced technologies
2%	Other
22%	Not applicable

That involves software. "We need operators, but it's a skill. You can teach someone in-house how to be a laser operator. That's not something they're going to learn in school."

That approach is finding its way into hiring for professional services firms as well, said Jim Menzies, who is the Ontario manufacturing industry leader at Grant Thornton LLP. "At our firm, people are interviewed primarily for character and behaviour. We then provide them with technical skills training once they are hired. We're talking about people who eventually become professional chartered accountants where we know when we bring them in that there's still a lot for them to learn."

The way companies source talent is changing. Whitney uses his LinkedIn account to develop a talent pipeline, and he's a big fan of the First Robotics high school program. "We sponsor several high school teams in and around our area in London. One

You need to have training models that fit each and every employee when they start, and then, particularly for young people…

— Steve Loftus

of the twists I put on it is giving the team half the money, then the other half when the team and their parents tour my shop… so you get that dialogue going at home. That's a really long-term project, but I believe it's bearing fruit for us."

Sherman has found great success exposing potential new hires to what a real work day looks like, either by hosting a plant tour or having them tag along with other employees at a customer's work site. "So much of what we do is either in the customer's eyes or even at their location (commissioning equipment). We're talking about somebody who's comfortable in front of a customer, motivated and sees opportunity. If they respond really well to it, chances are they have runway for other roles too."

Whitney believes companies need to do more with Take Our Kids to Work Day. "Ten years ago, we used to let them watch movies in the conference room, but then developed a program where they design and make something through the day. It's been very successful and well received. My intention this year is to challenge them to do a video of their experience, then I'll pay for the best one."

EMC companies have run tours for local colleges and high schools, but Casemore said the goal is not just to reach the students. "We want to get to the teachers and guidance counsellors, to let folks experience and see that a manufacturing facility is not the dingy place that their parents maybe once said it was. There's a lot of automation technology happening, and a plant would be a pretty cool place to work."

Innovative Automation taps social media to make contacts and engage people, but last spring the company hosted a very successful open house that included booths by vendors and Georgian College, all aimed at high school students. This highly organized affair had buses doing pick-ups at schools across Barrie and dropping off students every 15 minutes. Young employees were the tour guides. "They have to learn all the history of the business, which breeds into the culture and gives them some real personal ownership of what's going on," Loftus explained.

Students who take part in Take Our Kids to Work Day get hands-on experience. They design something that goes to the machine shop; they load the CNC program; the machine cuts the material; they work with programmers; and they go to finance.

"They have to cover the cheque, the whole bit. And based on that, we get lots of callbacks. 'Can I come work here in the summer?' Typically, we're not hiring summer students, but we are directing them in grades 11 and 12 to what type of courses it takes to work at our facility."

When Grant Thornton goes out to audit a company's financial statements, one of the first things it does is arrange a plant tour for its people, Menzies said. "Many of our younger people will tell us that it's the first time they've ever been in a plant.' Or, 'I didn't realize how much went into making products that we use every day."

Canadian companies are underemploying advanced technologies.

Riding the tech curve

The use of technology in manufacturing is important. That draws a lot of youthful talent and generates excitement, said Dale Kehler, vice-president, product services at SYSPRO Canada, an ERP provider with offices in Mississauga, Ont. "One of the key things from my perspective is every manufacturer will have a need for people that are working in data and technology – and that's attractive to students."

Of those who are applying advanced technologies to improve productivity, 45% custom manufacture; 38% use automation technology; 32% employ virtual design, engineering and testing; and 31% use computerized processing, fabrication and assembly technologies. But 21% don't utilize any of the listed technologies.

Canadian companies are under-employing much of the smart technology that their global competitors are applying to improve productivity and advance their businesses.

Most executives recognize the importance of productivity improvement: 87% are providing or intend to provide employee training over the next 12 months; 71% will develop a productivity improvement strategy; 65% plan to implement improvements in materials and energy management; and 63% plan to invest in automation technologies. But 60% are not implementing digital transformation technologies. Shop floor production equipment and operations data are mostly collected, analyzed and reviewed manually by 43% while 33% use automatic collection methods.

IIoT connects and optimizes machines through the use of sensors, advanced analytics, business intelligence and decision-making.

Survey results reveal only 7% of respondents are applying IIoT technology, 10% have a plan and are investing in technology while 20% are in the process of evaluating its relevance, but 32% aren't familiar with its capabilities.

Of those applying IIoT, most (18%) are doing so to improve efficiency and productivity, 14% are tracking materials and shop floor assets, and 11% use it to provide more visibility into their production processes, and improve maintenance functions.

The biggest obstacles to deploying IIoT are not knowing how to start (33%), lacking knowledge about the technology and how it would apply to operations (28%), uncertainty about how to deploy it effectively (26%), and the cost to upgrade machinery, equipment and systems is too high (21%).

Although the survey results suggest otherwise, Casemore believes many manufacturers are farther ahead on the technology curve than they realize.

"I'm walking into plants where I've seen a lot of things and I go, 'Wow' about something to do with technology. I think manufacturers are so far advanced in some ways but don't recognize the technology they've already introduced is advanced."

SRP is embracing technology. There are customer portals and all the machinery is on the "net" driven from the engineering department rather than from the floor.

"We've automated the labour tracking process to get a better angle on our costs, and implemented CRM for the sales force. Some areas have it, some haven't."

IMAGE: ADOBE STOCK

If you provide a better culture, you tend to get happier employees who stay longer…

— Craig Mannell

A three-year ERP implementation is yielding some efficiencies. "The biggest thing is it's very open. You can pull stuff out into spreadsheets, scrub it and send it back. You could never do that with the stuff we had before."

Customer portals will help lessen the time spent dealing with simple issues. They can go into a portal and find out the status of their order, or enter an order. "We're also being sensitive to our distribution channel (think Amazon, for example), how it's evolving, but ahead of where it's going."

Staying on top of developments is challenging but SRP is involved in several industry groups, such as TEC Canada **(tec-canada.com),** a networking group for executives. "These are all topics that come up at the meetings. It used to be we never went to any of those things. Now, we're spending a lot of time at meetings or being part of task forces and committees just to find out what's going on."

Whitney emphasized the importance of software. "I heard a speaker a couple years ago say, 'In five years, every company is going to be a software company.' Everybody kind of rolled their eyes. But he explained, either software is going to be rolled around your product or software is going to be a competitive advantage in your internal processes, and I bought into that. We now have two or three full-time app and data development people in our company."

The idea of doing a $400,000 ERP implementation over three years can be daunting for companies. Armo-Tool started building its own tools that access data from the ERP system, then added other data, taking baby-steps over two years. In the coming year, he expects the company will buy a commercial tool.

Whitney noted a cultural component to the technology issue. An employee may be accustomed to and comfortable with spending two hours a day wandering around the shop looking for parts. But spend 20 minutes a day typing barcodes and putting stickers on them? " 'Not doing it. What a waste of time.' You have to find a way of bridging the gap. For a while you're going to have to do the two hours and the 20 minutes. In a year, when the system is working, when your robot stops dropping off parts in the wrong spot, then you finally get the payback."

So much of what we do is either in the customer's eyes or even at their location...

— Dave Sherman

One of the tools Gale is most proud of is the company's quality monitoring. "Lots of us have tri-mics and digital measuring equipment. Mitutoyo has transmitters and receiver systems. You can get that data into a computer in the QA lab, which we do in real time. For example on some tight tolerance, high requirement jobs, we'll have manual SBC tracking. As the operator is reading the gauge and saying, 'Okay, that's one of the numbers,' and putting it on a manual chart, that data's already in the QA. It has gone through a piece of software, it's displayed visually on a 42-inch flat screen in the room that shows all our key jobs and metrics. And it gives it a colour coding, which Toyota loves – green, yellow and red. If everything's good, there's a green box around the chart on that TV screen. I can take customers by. We show them a screen full of green boxes and we know everything's going just fine."

Loftus looks at technology issue from two perspectives: one as a machine builder capable of adding it to machines to meet customer needs; and from a business perspective. Innovative Automation is using its own ERP system created in the early 1990s: a collection of 65 different applications that the IT department custom-built for manufacturing.

"As a company that's probably five times the size it was when that system was put in place, and with the tripling of our business during the last four years, I believe (the ERP system) is getting beyond its capabilities," Loftus said. "We've had great success with our own product because any time you want to make a change it's internal. Our team of people know that product inside and out, and have been able to generate a lot of great reports." But he noted some of those reports are manual. A new partner that analyzes the data is helping to drive net profits, which have almost doubled based on using fact-based versus gut decisions, he said. That's having a huge impact. "The fact that we changed how we make decisions and generated that much more profit has led us to the point where this thing has lived its life. It's rewarded us well but it's time to create something that's completely automatic."

Kehler said the ERP industry is moving to a systems services approach and away from big applications that people need to spend three years implementing.

"What that really means is we're starting out identifying projects of real value and putting that framework in place, then building components, building applications and connecting to services that are available on the web or that you build internally. And then you're seeing subscription-based services. You're de-risking that investment by lowering the investment required. And it's also allowing you to just step into projects, identifying very specific use cases where you're going to deliver that value."

Risk

Identify & MANAGE

How to strengthen the security for your business

Begin the process with an assessment. IMAGE: ADOBE STOCK

By Kim Laudrum

The Trump era, the rise of American and global protectionism, changing trade policies, cybersecurity threats and rising costs of climate change measures cause Canadian manufacturers serious concern, according to the **PLANT** Manufacturers' Outlook 2019 survey. Yet, less than 30% of those companies conduct a regular assessment, which could help them mitigate all of those risks to their enterprises.

What's a manufacturer to do?

David Florio, partner, at Grant Thornton LLP, says developing an enterprise-wide risk management program that's conducted periodically and tested regularly is a good idea.

"Whenever we look at risk management in general, whether it's cyber or any other type of risk such as financial, operational or reputational, rarely, if ever, do you get to a point where you can mitigate your risks to zero. There will always be some residual risk. The big question is, what are organizations doing to manage risk to acceptable levels?" Florio asks.

Many manufacturers don't know where to start. "They don't know what risks they're potentially facing and they don't know what to do to potentially lower those risks," Florio says. "Starting with an assessment at a point in time is really the beginning of that process."

He suggests manufacturers first identify potential risks. Conduct an assessment of those risks based on the likelihood one might occur, and if it does, what the impact might be on the organization.

Repeat the assessment process periodically to identify any new risks that come up, and to reassess current risks since the last time because they may have changed. For example, on Nov. 1, 2018 changes were introduced to the Personal Information Protection and Electronic Documents Act (PIPEDA). This regulation under Canada's federal data protection law requires companies in the private sector to notify the Office of the Privacy Commissioner of a breach of security safeguards involving personal information under their control if it's reasonable in the circumstances to believe the breach creates a real risk of significant harm to an individual.

It's important to look at the impact of a risk throughout the organization, not just within the one department or silo. For example, ransomware is a well-known cyber threat that could have financial and operational ramifications. Florio cites a scenario involving an attacker getting into your computer, encrypting data and demanding payment for its release.

"There's a financial risk, but also an operational risk because at a certain point in time if you can't access your systems or data, your productivity could come to a stop."

You can also expect ramifications outside your company. If it gets out into the market that your organization has been the victim of a cyber attack, your customers could react fearfully and that could impact your reputation. There's no guarantee data will be recovered if you pay the ransom and there's also jeopardy placed on your operations.

There are a couple of simple things to do that help protect against ransomware. One of them is to have good formal backup and recovery procedures that are operational and tested periodically.

"If we find ransomware today and they have encrypted critical areas of your network or certain data, with a good formal backup and recovery policy, recent data could potentially be recovered so the timeframe to restore operations is shortened, rather than spending days or weeks trying to figure out how to pay the ransom, recover and hopefully move on," Florio says.

Working in silos does introduce risk and it doesn't have to happen just within the cyber space. That would be like the finance department just doing a finance risk assessment and not looking at the inputs and outputs to operations or other parts of the business. Look at risk assessment and management from an enterprise point of view. "Parts of the organization may look at the same risk differently, and if you are not having those conversations across the different parts of the organization, you are potentially leaving risk on the table that you wouldn't have left otherwise."

Florio's practice is seeing more organizations formalize some of the foundational policies and processes that help manage risk. For example, organizations are formalizing backup and recovery procedures, disaster recovery procedures, incident identification, management and response. He says it's also a good idea to keep anti-virus software up to date on all servers and all critical systems. Use patches from vendors, who are aware of vulnerabilities, often.

It's also good security hygiene to have those processes in place and tested periodically because the threat of cyber attack is real. "It's not just a matter of 'if' this will happen, but 'when,'" he warns.

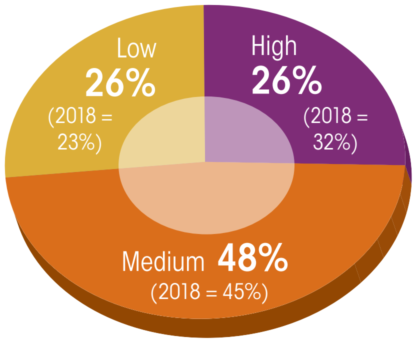
Indeed, Florio observes people outside of IT are starting to understand these risks occur. "Often I'll hear from clients who say, 'Now that our CEO has seen the risk assessment our department is getting more attention.'"

Manufacturers should see this as not just an IT issue, but as a business issue.

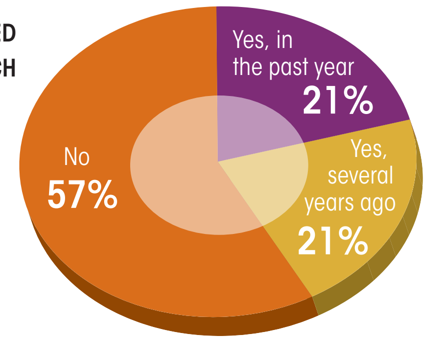
Kim Laudrum is a Toronto-based business writer and regular contributor to **PLANT**. *E-mail klaudrum@rogers.com.*

Cybersecurity

SECURITY RISK CONCERN 2019



EXPERIENCED A BREACH



TYPES OF ATTACKS	
Phishing attack	62%
Data breach or loss of proprietary data, personal or financial information	18%
Targeted external cyber attack	16%
Data encryption or random operational/ control, financial information, management or communication systems	15%
Banking or other financial attack	12%
Breach through a third party vendor	10%
Other	8%

Subscription-based service has been a great help to SRP. "As we've been implementing our system, suddenly people are being locked out. The controller will just pick up the phone, call the provider and say, 'Add a license.' And it's so much per month, not another $5,000 seat," Merritt said.

The NGen advanced manufacturing supercluster is focusing on how to speed up the adoption of technology, and it's not all new technology, Myers said. "There are an awful lot of off-the-shelf solutions that already exist, and

PREPARATION FOR BREACHES	Very prepared	Preparation underway	Not prepared
Data breach or loss of proprietary data, personal or financial information	53%	35%	12%
Data encryption or random of operational/control, financial information, management or communication systems	50%	36%	14%
Phishing attack	53%	34%	13%
Banking or other financial attack	58%	29%	12%
Breach through a third party vendor	42%	36%	22%
Targeted external cyber attack	43%	36%	21%

MEASURES IN PLACE

66% Security infrastructure

27% Crisis management procedures and/or a business continuity plan

56% Data privacy controls

16% A cyber breach response plan

42% A cybersecurity strategy

7% Other single mentions

37% Cybersecurity risk assessments/ review

in implementation they really drive significant transformation in companies."

NGen is also looking at is why Canadian companies are seemingly lagging, but in terms of rates of investment, Myers isn't convinced that is the case.

"We've got a lot of small companies that I think are investing, in terms of their size, probably even more in technology than their equivalents in the US. So size is a big issue and availability of resources to manage those technologies is an issue."

Some of the group's work is based on a Statistics Canada survey about business practices, technology and innovation. Only 7% of manufacturers do any competitive benchmarking. "So, 93% are working in the dark. But that's better than the technology sector because out of 3,000 technology companies, only 2% do any competitive benchmarking," Myers noted. "They're bringing new technologies to the market, but they don't know what anybody else is doing."

He also believes many companies are making investments in technology. "The issue is not whether they're implementing it, it's whether they're achieving their business objectives."

The Statistics Canada survey shows between 35% and 50% make investments in technology that don't achieve objectives such as cost of production, product improvement and process improvement.

"That tells me either the objective is too ambitious, the technology was inappropriate, they didn't have the management capability or they didn't have the skill sets to implement or to manage the technology appropriately. In any case, it's a management problem, not a technology problem."

He said two areas need focus: what technologies are appropriate to solve a particular problem, and what problems do you need technology to solve? "Often this comes down to very basic lean principles. If you're going to start automating, maybe you want to start where you have a bottleneck."

Citing the 2018 Outlook survey, he observed about 30% of companies reported they don't use any sort of advanced technology, yet investment and adoption is increasing. "That tells me companies are investing more, but there are a lot – probably very small companies – that are still not investing in what seems to be advanced technology."

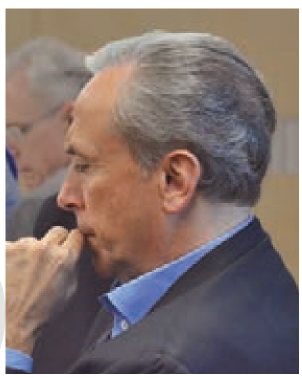
Kehler stressed the importance of finding the business value. He offered the example of a refrigerator manufacturer serving large retail outlets.

The plan was to install sensors in the refrigerators that would signal when the lights went out to trigger service and replacement. These Internet of Things (IoT) devices were collecting a lot data in the cloud and by applying machine learning, it was possible to anticipate when the lights would go out.

"You are getting smart about the device and you become

Cybersecurity is a risk that should be on everyone's radar. Many people think that cyber issues primarily impact large companies. In fact, that's not true…

— Jim Menzies



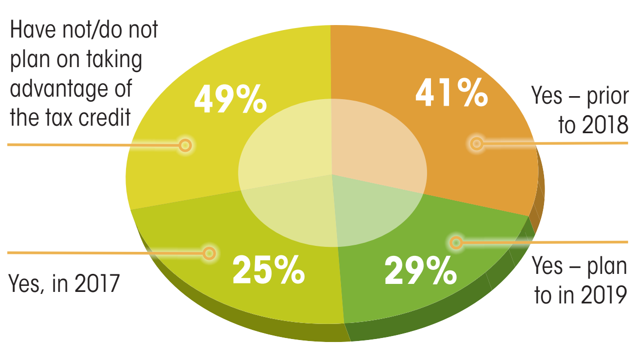
Innovation

INVESTMENT IN INNOVATION	2017	2018	Projected 2019
0%	5%	12%	10%
1-3%	37%	38%	35%
4-6%	20%	21%	20%
7-10%	10%	8%	13%
More than 10%	3%	6%	4%
Any spend	85%	88%	90%
Average % innovation spend	3.2%	3.7%	3.6%
Don't know/not sure	14%	15%	18%

INNOVATION FOCUS

Products	57%
Processes	56%
Technology	47%
Services / Customer experience	39%
Marketing	35%
Supply chain	20%
Materials / energy management	17%
Business model	16%

USING SR&ED



GOVERNMENT GRANTS, FUNDING – 98 users

14% It was a great experience, easy to navigate and worth my team's time to apply.

53% It was as expected, clear guidelines and process to follow.

33% It was cumbersome, confusing and slow.

INNOVATION COLLABORATIONS

Suppliers of equipment, materials, components or software	54%
Clients or customers from the private sector	42%
Parent, affiliated or subsidiary businesses	30%
Universities, colleges or other higher education institutions	24%
Clients or customers from the public sector	17%
Consultants and commercial laboratories	15%
Government, public or private research institutes	13%
Other co-operation partners	11%
Competitors or other businesses in the sector	10%

IMAGE: ADOBE STOCK

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WHAT WOULD MAKE INNOVATION EASIER?	
Higher SR&ED tax credit rates/easier eligibility for SR&ED program	42%
Increased funding from governments	40%
Direct support for innovation through government grants	35%
Lower tax rates on income directly generated from innovation activities (i.e. innovation boxes)	35%
Easier access to financing to fund innovation	31%
Developing closer connections with sources of training and apprenticeships	26%
Access to technology demonstration, testing, and pilot centres	20%
Ability to see technologies at work/discuss requirements for successful technology management	17%
Collaborating with other companies/organizations and pooling resources.	17%
Embedding an innovation culture throughout the organization	17%
Easier access to universities, colleges, research centres	16%
Better protection of your intellectual property/patents in foreign countries	13%
Immigration law reform allowing more skilled labour to enter Canada	13%
Identifying local technology capabilities on the part of businesses, research and educational organizations	12%
Developing virtual prototypes vs manufactured ones	10%
Government sponsored public profile/recognition programs for successful innovators	9%

proactive by predicting which fridge (or machine) is going to fail, and when," Kehler said. "You can get ahead of it and service the customer accordingly."

The manufacturer also realized it was no longer in the business of selling and servicing fridges. "Now it's in the business of offering retailers higher profit margins and we all know in retail, profit margins are super thin. Any company that's going to offer a product that keeps those fridges open and active – and customers buying from them – is going to be the supplier of choice."

Cyber concerns

The survey shows hacking into company networks to steal confidential information or create havoc continues to be a concern for manufacturers, although most companies (48%) see the risk to be at a medium level, while 26% list it as high and 26% identify it as a low.

Nonetheless, most are readying themselves for trouble. Eighty-eight per cent are very prepared or preparing for: data breaches and loss of proprietary data; 87% for phishing attacks; 87% for banking or other financial attack; 86% for data encryption or ransom attacks; 79% for targeted external cyber attacks; and 78% for a breach through a third party vendor. Most (66%) have established a security infrastructure and data privacy controls (56%), 42% have a cybersecurity strategy; and 37% have done a risk assessment.

The attacks or breaches experienced most were phishing (62%), data breach or loss of proprietary data (18%) and targeted external cyber attacks (16%).

"I think the risk in terms of cybersecurity is going to increase as Industry 4.0 and IIoT are implemented and used more," said James Johnson, a senior trade analyst for the Italian Trade Commission and project manager for Machines Italia.

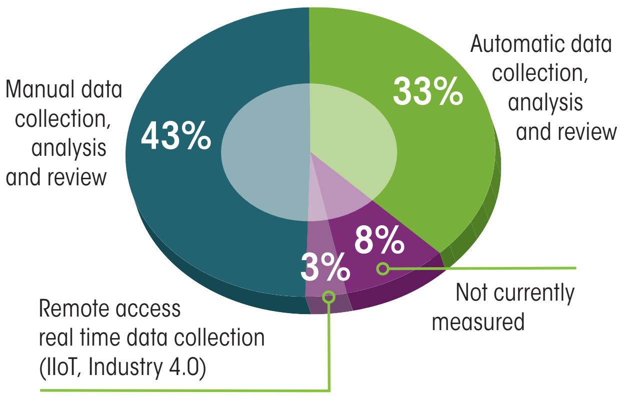
"Cybersecurity is a risk that should be on everyone's radar. Many people think that cyber issues primarily impact large companies," Menzies said. "In fact, that's not true. Most cybersecurity issues in Canada impact companies with less than 100 employees."

One of the key things from my perspective is every manufacturer will have a need for people that are working in data and technology…

— Dale Kehler

Productivity

MEASURING PLANT FLOOR DATA



ADVANCED TECHNOLOGIES USED	
Custom manufacturing	45%
Automation	38%
Virtual design, engineering, and testing	32%
Computerized processing, fabrication and assembly technologies	31%
Control technologies/systems to monitor processes in real-time	19%
3D printing/additive manufacturing	18%
New materials (such as composites)	18%
Advanced robotics	11%
None of the above	9%
Scalability	7%
Not Applicable	12%

IIoT APPLICATION	
18%	Improving efficiency/productivity
14%	Tracking materials, shop floor assets
11%	Improving maintenance functions
11%	Providing more visibility into production processes
9%	Analytics functionality
8%	Developing smart products
7%	Developing new services/revenue streams
7%	Tying in business data from shop floor to top floor
3%	Consolidating control rooms
38%	Not currently applying IIoT
34%	Not applicable

IIoT ENGAGEMENT	
7%	Currently applying IIoT capabilities
10%	Have a plan, investing in technology for deployment in next 12-14 months
20%	In the process of evaluating its relevance to operations
32%	Not familiar with IIoT capabilities
31%	Not applicable

IIoT OBSTACLES

33% Don't know where to start

28% Lack of knowledge about the technology, how it applies to operations

26% Uncertain about how to deploy effectively

21% Too costly to upgrade machinery, equipment, systems

16% Lack of skills

14% Concerned about exposure to cyber security threats

4% Too risky to upgrade machinery, equipment, systems

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PRODUCTIVITY IMPROVEMENT (NEXT 12 MONTHS)	Have taken	Plan to take	Not applicable
Developed a formal productivity improvement strategy	**42%**	**29%**	**29%**
Competitive benchmarking	**35%**	**25%**	**40%**
Lean, Six Sigma, other CI measures	**30%**	**21%**	**49%**
Investing in automation technologies	**32%**	**31%**	**37%**
Digital transformation (IIoT, Industry 4.0)	**14%**	**26%**	**60%**
Outsourcing manufacturing	**24%**	**17%**	**58%**
Outsourcing support roles	**17%**	**16%**	**67%**
Employee training	**61%**	**26%**	**12%**
Specialization of product offering	**32%**	**23%**	**45%**
Enterprise-wide business intelligence/analysis	**20%**	**26%**	**54%**
Improvements in materials/energy management	**33%**	**32%**	**35%**

Merritt encountered a disturbing security issue when he was in China two years ago. “I was heading back to my hotel and had a message from my CFO that she’d sent the money I’d asked for, and she was going to look after the second transfer later today. I didn’t ask her to send any money.”

She had received an e-mail from “Merritt” announcing he had found a new supplier and needed an $8,000 deposit. That was followed up with a request of $30,000 for another new supplier.

“It was very well done,” he said. “They knew where I was, and when I was coming back.”

People who work for Merritt have connections with the police, so he ended up in the cyber crime division of Chiang Dao Police Department.

“These guys in black t-shirts sitting around smoking were able to get into the bank account that this money had been sent to and verified that it hadn’t arrived. We were actually able to put a freeze on the transfer and got the money back.”

Since then, no transfers unless you speak to the authentic Merritt.

Whitney likes to think he’s cyber-careful, but he was almost duped by a reset password request that looked like it was coming from his IT guys.

“It had our logo at the bottom, and it was both formal and informal. ‘You wanna click on the gear, you wanna go over here…’ I never get fooled, but I clicked on the link, and then it came up in my web browser, the whole screen turned red, and it said, ‘You have been prevented from going here, this is big trouble.’ So my IT guys had already blacklisted whatever website it was trying to take me to.”

The company has experienced a ransomware attack, but he said the back-up system is robust. “I know I’m lucky to have a really good IT guy who’s also leveraging smart people outside. I can’t understand why anyone would say they’re not subject to phishing attacks. Everyone is getting phishing attacks, everyone’s getting these fake e-mails that are trying to get you to reset your passwords.”

Innovative Automation’s IT team sends out tests to its employees. “As soon as you click, it says, ‘This is a test, you failed,’ ” Loftus said.

About a quarter of the people were caught at least once. Now, everybody is very cautious. “I’ll get phone calls all the time, ‘Did you send me an e-mail?’”

Kehler knows of several companies attacked in the last 12 months. The impact can be severe. “It may result in days of downtime. Of course, afterwards, they've been looking for ways to mitigate the risk and secure themselves. But it's really something that needs to be front and centre of people's strategies and in their plans going forward."

At Hobart, the customer care order entry group was targeted. About 25% of orders involve issuing a purchase order to a third-party supplier. "Then all of a sudden we're being asked to show a PO or put money in place for deposits for production. There has to be a very intimate level of knowledge about what we do, to be able to put something together that looks fairly believable. And that is the scary part of it."

EMC has put together a cybersecurity plan for its members, working with N-Dimension, a specialist in Richmond Hill, Ont. "They ended up piloting their service with some of our members to see how it went. It was successful." It put together the EMC Secure program that will provide more than 13,000 consortium members with access to N-Dimension's technology platform (**www.emccanada.org**).

The business environment for manufacturers is rife with risk in addition to cyber threats. There's the speed of technology change and its disruption; tax reform and protectionist moves emanating from the US while also rising elsewhere in the world; uncertainty arising from NAFTA negotiations and whether the new US House of Representatives will even pass the successor USMCA; steel and aluminum tariffs, plus other rising costs at home, whether its electricity, carbon pricing or regulatory issues involving labour, all of which are making it hard for companies to be competitive.

So how are companies dealing with these and other risks? Menzies is finding manufacturers are shortening their planning views.

"If I was sitting down with a client a few years ago, they would want to discuss their five- to 10-year strategy. As we've talked around this table before, these days it's really hard to climb that tallest tree to overlook the forest when you think you're in the middle of a hurricane. It's making many businesses go from that long-term view to a very short-term view. They're uncertain of what's going to happen three to six months from now, so they're managing from day-to-day, and from week-to-week. That's a tough spot to be in."

Although risks are elevated, Myers said it's only bad news for companies that are standing still. "I think the most interesting stats in the survey are about the number of companies that are looking at partnerships and investing in new technology, machinery, and equipment, and new product development, because that's where the value is. That's where companies have to figure out how they differentiate themselves from pretty tough competition."

Myers said a better job could be done measuring manufacturing. "I think a lot of that value we're creating is being passed off as simply price inflation. But we're not really accurately recording the value for customers generated as a

Corporate Culture

You need a PLAN

A formal program offers competitive advantage

By Kim Laudrum

Having a good corporate culture helps boost a manufacturer's revenues, attract and retain top talent, and improve both competitive advantage and product quality.

Yet, according to the **PLANT** Manufacturers' Outlook 2019 survey, only 28% of firms said they have a formal corporate culture program in place. Others said they were working on it. Almost half have no program.

One definition of corporate culture is the values, beliefs and attitudes that characterize a company and guides its practices.

Culture is often implied rather than defined. It's shared beliefs, values and attitudes of an organization that determine the behaviour and interactions within the organization – simply defined as 'the way things are done.'

"There's a perception you don't have a corporate culture if you haven't established a program. But there's an argument that says you actually do have a corporate culture. However, it may not be the one you want, or the one that's going to help you with your business strategy," says Nicole Deveau, practice leader, strategy and operations, Grant Thornton LLP.

An ill-defined corporate culture can have negative consequences on revenue, Deveau warns. "We know that employees in such organizations tend to feel less happy or less motivated." Such companies are marked by high turnover, lack of engagement and tension among co-workers.

Of the survey respondents who do not yet have a program in place but are working on it, the number one reason to establish one is to encourage employees to work together better (79%) and to appeal to customers (40%).

Ambitious companies can find it very difficult to get an

ADOBE STOCK

employee to contribute to the company's growth strategy – for example – if his/her values are not aligned with the company, she says.

If an employee is criticized or reprimanded for taking a step that has not been approved, that employee may think twice before making decisions in the future. That kind of attitude towards the employee is demoralizing, ineffective and stifles innovation and advancement.

However, where the corporate culture is tied closely to the company's strategic goals – say revenue growth – employees are more likely to advance that shared vision. In an environment where employees feel valued and empowered to make a mistake and learn from it, they're much more likely to go out on a limb to advance productivity.

One in five survey respondents said their third biggest challenge was timely identification and escalation of risk issues within the company. Part of the reason was the company's culture. What if there was a crisis, like an IT issue on the plant floor? Who does what?

Deveau says a company's corporate culture should define how things get done. "There should be an accepted way of how we do our work and how we treat each other. It should define shared beliefs, shared values, how work gets done and how we're going to work together."

But there's a caveat. "Policy and procedures are important. But a sign of a good corporate culture is when people do the right thing even when those policies aren't in place."

Almost half (46%) of the respondents cited finding management talent and filling skills needs as key challenges, right behind managing escalating costs (76%) and prices (51%).

Good corporate culture gives an organization a competitive advantage attracting the best people. The number one area where manufacturers are experiencing shortages and deficiencies is general labour (49%).

"In the recruitment space, as an example, culture really is an important part of the employer brand," she says. "For some prospective employees, organizational culture and shared values are actually more important than compensation."

Respondents who have a program cited their top reason for developing it was to retain current staff (88%). But they also want to attract the highest calibre of people (58%).

"If an employee feels there's a positive culture he/she can stand behind, that employee is more likely to display long-term loyalty to the employer because there is some element of a shared purpose – 'we are all working toward the same thing,'" Deveau says.

Ultimately, good corporate culture will foster employee loyalty and retention. Deveau recalls the adage: "People don't leave jobs. People leave managers."

A corporate culture program that recognizes and rewards employees' positive contributions goes a long way to building morale. Providing performance appraisals and constructive feedback ensures employees know they're on the right path.

"If they don't have a culture of providing feedback, employees can feel undervalued. They might wonder, 'How do I grow and develop as a person?'" she adds.

What does a good corporate culture program look like? Survey respondents with a corporate culture as part of their formal business strategy said the number one element is training (81%). Two thirds said they have diversity and/or inclusion policies, followed by recognition (50%), health (49%) and flexible work (42%) programs; corporate social responsibility initiatives (39%); benchmarking (32%); and robust benefits (32%).

Recruitment can be expensive, time consuming and a drain on productivity. It's far better to retain good people by providing a positive work environment. Developing a corporate culture aligned with being a caring employer, responsible community contributor and innovative manufacturer is a magnet for stellar clients.

What good corporate culture looks like

LMI Technologies, a manufacturer of 3D scanning inspection equipment based in Burnaby, BC, made the 2018 list of Best Workplaces for Millennials.

Some of the benefits provided by the mid-sized enterprise include profit sharing, 100% coverage of BC's Medical Services Plan plus benefit premiums.

Employees have access to a gym, tennis and basketball courts, riverside running and walking trails, weekly lunches and free snacks and coffee or tea daily. Workers enjoy flextime, a monthly internet subsidy, and full tuition or professional development support for skills and career advancement.

Employees told the award organizers they felt they could trust the people they work for, have pride in what they do and experience camaraderie with their colleagues.

Look for the real value in partnerships, investing in machinery, equipment and technology, and developing new products. IMAGE: ADOBE STOCK

result of better products and service."

Casemore said legislation such as Ontario's Bill 48 (Fair Workplaces, Better Jobs Act 2017) creates a distraction for manufacturers, which means less time for planning. "And less time for planning means either a decision made that isn't well thought out; or it's not made because there isn't enough time to think it through. If you can't plan, you don't take action. Therefore, you can't keep up the volumes. You can't make the best decisions for your organization."

Loftus conducted his own version of risk assessment, looking back at the "noise" coming from the US. "We made a conscious decision to change the whole direction of our company and generate more of a global footprint. So we've made strong efforts to move into the European market. We've worked a little bit with Asia. We've sold three machines into China, and I'm travelling there to set up some service partners. That allows us to bid on particular projects for a European company with the facilities here in Canada that we're presently supplying… Meanwhile, US sales are actually up, so the growth in our company has increased substantially."

Whitney is concerned about recession. "I think it is the most pressing risk. We're highly automotive-focused, and volume is not enough. We need launches because we're building equipment, and launches are due to decline, so I would say it's going to be challenging in that segment."

His company is working on market diversification. A fabrication outfit acquired a year ago doesn't do any auto business. Relationship building is also underway with a company in Germany to distribute and support their equipment in North America. "When we went to Germany, there was a project they were about to quote that really is quite core to what we do. So I think there's opportunity to also sell more back

There's a lot of automation technology happening, and a plant would be a pretty cool place to work…

— Shawn Casemore

into Europe. Whereas we used to really rely on having deep relationships with customers and repeat business, we're trying to have more new accounts going forward."

Formal risk assessment for Gale's company is relatively new. "Every three months, we do a formal assessment, and we talk about it in between. But we've identified a lot of things that we wouldn't have necessarily put down on paper a few years ago," he said.

There are all kinds of risks, and they evolve. For example, Kip Daechsel identified one risk for those involved in the burgeoning cannabis industry. The partner at Dentons Canada LLP said law firms have been busy helping clients deal with travelling to the US. "You go down there for Thanksgiving and mention you're in the cannabis industry, you could be stopped from going to the US. That raises a whole host of questions and uncertainty."

I think the risk in terms of cybersecurity is going to increase as Industry 4.0 and IIoT are implemented and used more…

— James Johnson

Culture development

Corporate culture was a new topic covered in the survey, which revealed more than half of the companies (52%) have formal and informal programs or policies in place. Twenty-three per cent are working on it but 26% do not include corporate culture in their strategies.

Of those who do include it in the business strategy, 63% said programs and policies intend to promote diversity and inclusion.

Skills training is part of a formal program for 81% of companies followed by recognition (50%), health (49%) and flexible work (42%).

Key benefits identified by executives include: retention of current staff (88%); better employee collaboration (78%); improved productivity (66%); the attraction of the highest calibre staff (58%); and production and business efficiencies (51%). Increased profits was noted by 35%.

There's no formal plan for developing SRP's corporate culture, but Merritt said it's in the company's DNA. Lean has been formally introduced with training that's helping to develop a lean culture. "I think that's one of the best ways to do this. The customer comes first, we're pushing that hard. We started a small company and we grew. We tried to keep that family aspect to it, although it's getting harder and harder as we grow."

Informal efforts include promoting teamwork and holding regular meetings that encourage people to get involved. "We try to recognize achievements. In fact, we do have a project now to develop more KPIs and a recognition program, with some form of reward scheme. We understand buy-in is important – getting everyone to work together first and have the same goal."

He stressed the importance of training. People are sent out for courses, or to learn how to use equipment, such as lasers. There's career development and if they pass courses, there is compensation. "That can be anything from an accounting course all the way up to a degree. We'll cover the cost of the degree."

Gale, who has extensive experience with the Toyota Production System, says it comes down to communication and visualization of everything, "so you don't have to spend as much time communicating. You put pictures up that we train people to understand quickly."

Ten-minute morning meetings involving management and the lead hands cover health and safety, delivery and issues of the day. Everybody has a chance to provide input. That meeting breaks up and five minutes later the lead hands are with their teams for a very brief "toolbox talk" where they share information discussed in the first meeting.

"In 15 minutes, I feel like we communicate to 100% of our employees the key details of what we are trying to achieve that day," Gale said. "We look back three years in all of our trends so our history is well understood and hopefully share our ideas of where we're going in a way that can be easily understood."

SYSPRO is a 40-year-old software company with what Kehler describes as a very strong sense of family, loyalty and a sense of community among employees and the reseller channel.

"We've been growing a lot, and we've added a lot of new people to the company. That's given us the opportunity to try to innovate and become a little bit more agile, as we move into Industry 4.0 with the ability to execute more quickly, adapt and become more innovative in the way we do things, and in the services and solutions we provide."

He said people aren't going to stay for rewards like compensation, they're going to stay for intrinsic rewards – a sense of satisfaction and purpose.

Innovative Automation has a multi-faceted approach. The mission statement talks about leading globally, which implies looking outward, and locally, which is about social responsibility. That includes being a big supporter of the United Way, which looks after multiple charities in the community. The company also supports Georgian College, Big Brothers and Big Sisters.

Every one of the company's 12 departments must run a

Retaining the right people depends more on intrinsic rewards than compensation. IMAGE: ADOBE STOCK

charity barbecue each year: the company buys the goods and everybody pays.

Armo-Tool is a family business with a strong culture. But Whitney believes expectations have risen. "A lot of the people we promoted were very strong technically, but not necessarily really strong communicators and people managers. We're working to improve what those people are doing and also insert new levels of leadership that helped to pick up the communication and engagement piece, and to leverage the knowledge and ideas of our workforce. The bar is constantly rising."

There will be more employee surveys over the next year to better identify people's priorities, and to ensure they're heard, he said.

When people skills are lacking, Gale recommends EMC's Manufacturing Leadership Certificate program. "It teaches some of those skills, supervisory skills, maintaining effective teams, coaching and developing people."

The certificate program includes six courses sponsored by a college. "It is an excellent program. I have a vested interest because I used to teach it many years ago."

Mannell described a company that cured its toxic culture when it was acquired by a European firm. The pre-acquisition culture was characterized by distrust, layoffs and rehires. Post-recession, the employees unionized.

"The new owner did a number of surveys and found out the culture wasn't very good, so it put in place a program where they took all the managers worldwide – especially Canada and the US – to the European headquarters for two weeks at a time."

They learned about pleasure at work, servant leadership and the importance of making employees happy, which Mannell said taught them to communicate in meaningful ways, and ultimately transform the culture into something more positive.

Another company dealing with trust issues opened up about its financials and future plans. "Then you get engagement, and people saying, 'Why are we heading in this direction? That doesn't make any sense.' "

This led one long-term employee to question why the company was making a certain product that was only 10% of the business.

"That's fantastic, that's a discussion I want to have with an employee who has built, touched, handled, made and shipped them," Mannell said.

Sherman highlighted Hobart's focus on customer-facing metrics on its service side. "In the past, they were very technically strong people but not so good with soft skills. We're trying to help them on those soft skills – how to communicate with a customer but even more importantly, what matters to a customer, which might be uptime, days to complete or days to invoice."

Menzies has observed manufacturing clients paying attention to the physical environment and making it as pleasurable as possible to have a positive impact on the culture.

Flexibility is also key. "That can come in all sorts of ways. For many companies, people not directly working on the shop floor don't have to come to the physical workplace every day. There are all sorts of other variations put in place by companies to allow more flexibility for their employees. That's having a positive impact, particularly with younger people, on how they view what it means to work for a company."

Myers noted a couple of factors impacting corporate culture and strategy. One is demographics. "We are seeing more people retiring, more younger people coming in, and skill shortages. Although inclusion and diversity may have come across from the politicians as a politically correct thing to do, it's also an economic and business imperative. How do we recruit more people, and engage more people in a workforce that's shrinking?"

The changing corporate environment has to be to appeal to younger people, he said. "I was on a panel when someone was talking about digital empathy, which means your ability to look past your smart phone and interact with people. So how do we engage a younger generation that's probably tech savvy, but not necessarily one that's engaged as much at a personal level?"

That leads to the disruptive impact of technology on organizations, the need for greater systems thinking, and how it affects reporting relationships. "All of that's going to be a major issue for every company going forward and it's not just in manufacturing. I don't know very many companies even in the high-tech space that are not being disrupted somehow."

Despite the disruptions and challenges, and though confidence may have ebbed since last year, manufacturers continue to see opportunity and are forging ahead. The importance of providing value to customers came up frequently during the roundtable discussion. It's central to corporate culture, finding and training people who will have the right skills to meet customer needs, protecting businesses from cyber mischief, and guiding investments in machinery, equipment and technology. Having customers on side will go a long way to mitigating the risks that flow from the uncertainties plaguing businesses while bolstering manufacturers' confidence in the years ahead.

You go down there for US Thanksgiving and you mention you're in the cannabis industry, you could be stopped from going to the US…

— Kip Daechsel