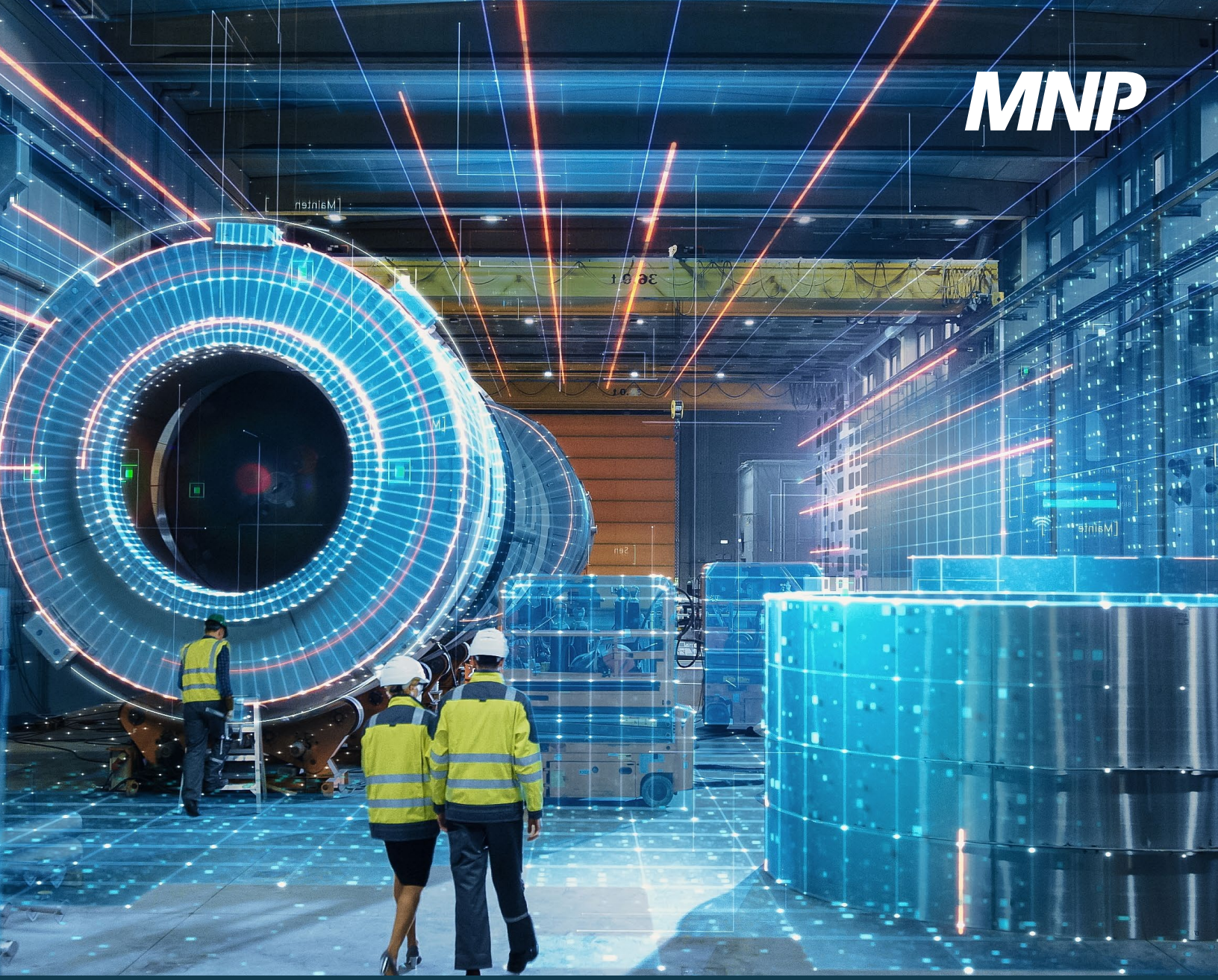


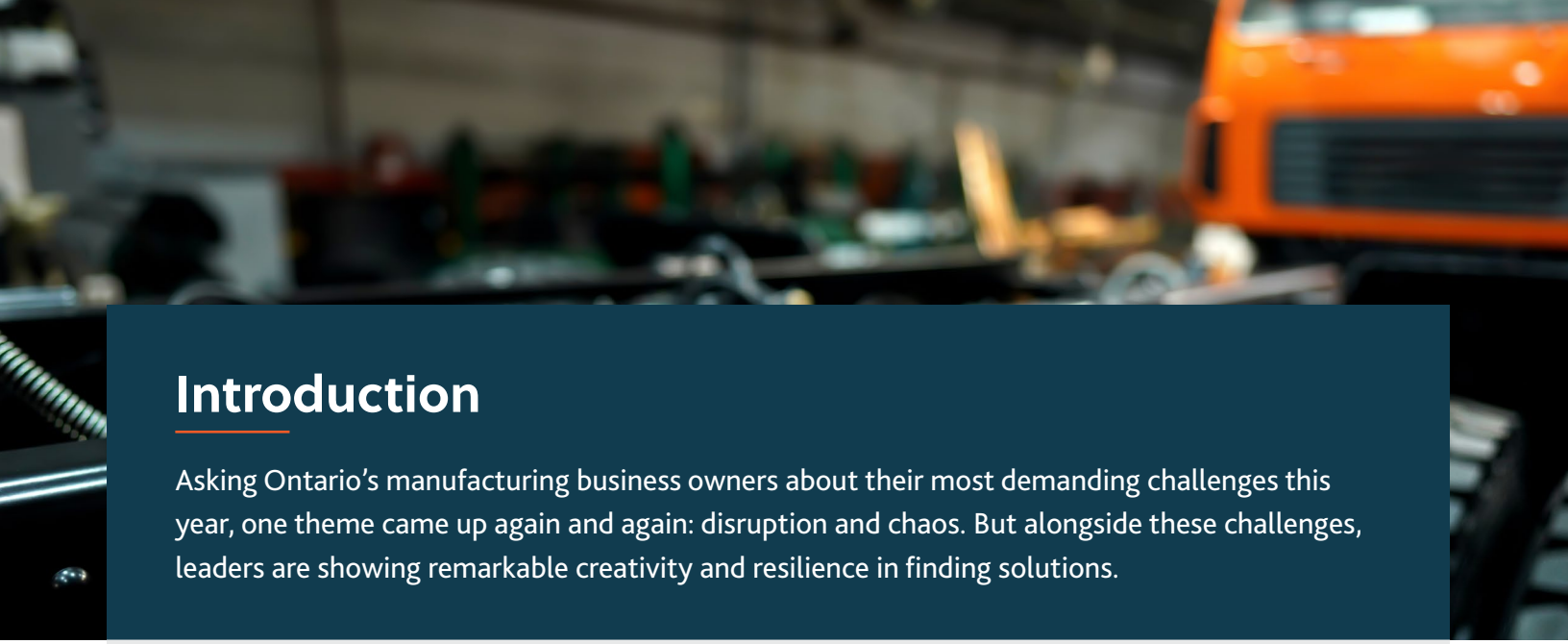
Innovation in the Business of Manufacturing

Owners reveal their biggest challenges — and best remedies

MNP.ca

Table of contents

> "We keep trying to be innovators in our field, to improve processes. As we do that, we become more profitable and more resources are available for improvements."
>
> – Jim Kranendonk, President, Curtainsider



Introduction

Asking Ontario's manufacturing business owners about their most demanding challenges this year, one theme came up again and again: disruption and chaos. But alongside these challenges, leaders are showing remarkable creativity and resilience in finding solutions.

To get a sense of the state of Ontario's manufacturing sector, MNP invited owners and management teams from companies across southern Ontario to two roundtable discussions — one in Burlington and one in Mississauga. The goal? To hear directly from those on the front lines about the challenges they're facing and the ways they're overcoming them.

The conversations were revealing. Five key challenges emerged, shared by many of the manufacturers who participated. But just as striking were the resourceful strategies these leaders are using to tackle those challenges head-on.

Innovation is often said to be in short supply in Canada, but our roundtables told a different story. We saw leaders eager to explore new approaches and inventive ideas.

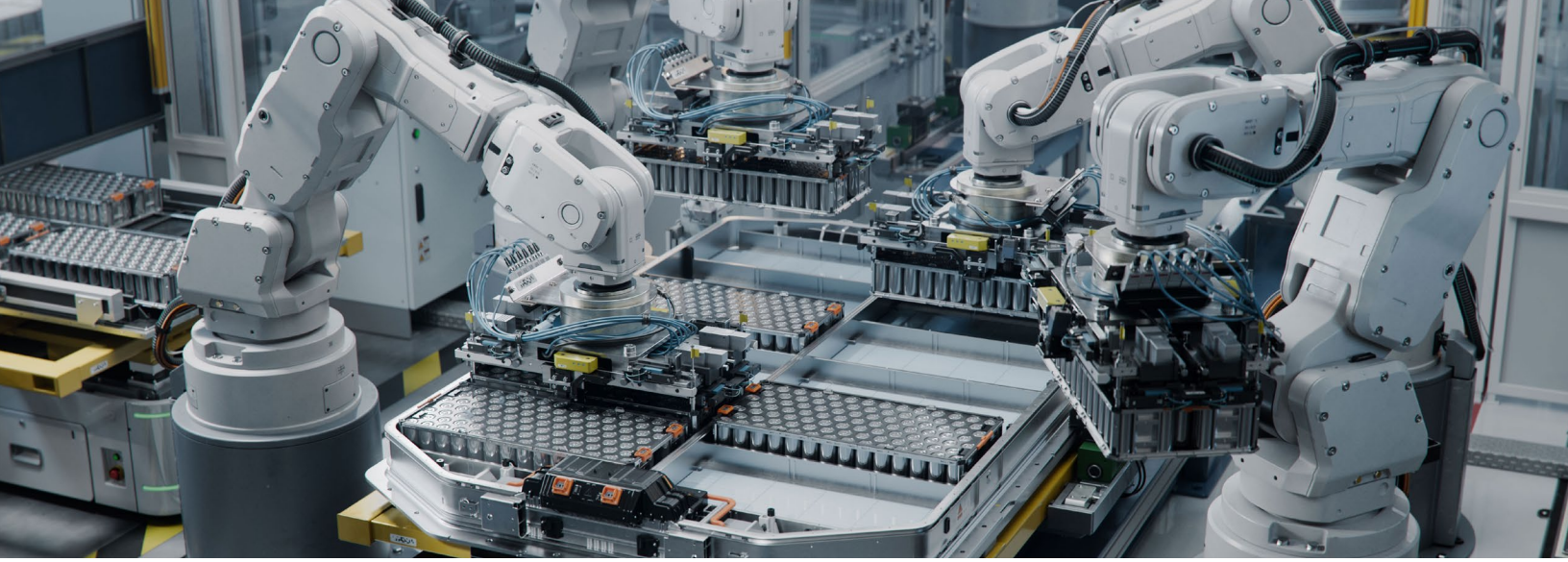
Inside this report, you'll find the big issues and the enterprising remedies these ambitious entrepreneurs are using to succeed in today's chaotic, competitive marketplace.

Roundtable participants

• Curtainsider Inc.	Jim Kranendonk, President
• Maneva AI	Kevin Sun, COO
• Swenco Limited	Chris Sweeny, Vice President
• Swenco Limited	Florind Molabecirovic, Logistics Coordinator
• D&R Custom Steel Inc.	Dan Engelage, President
• MTD Metro Tool & Die Limited	Marcel Pantano, CEO
• Amir Quality Meats Inc.	Tony Aziz, CEO
• Paris Kitchens	Carolyn Iyer, former COO
• Steelcon Group of Companies	Nafisa Madhani, Director of People, Culture & Safety

MNP hosts/facilitators

- Hussam Malek, Partner, National Value Creation Leader
- Pamela Lilley, Partner, Regional Manufacturing Lead, South Central Ontario
- Mary Larson, Partner, National Lead for the Strategy Consulting Practice
- Jason Lee, Partner, Digital Services
- Hali Van Vliet, Partner, Consulting, Human Resource Management
- Ryan Magee, Partner, Regional Manufacturing Lead, Toronto



Overview of our manufacturing industry and key trends

MNP provides an overview of 2024 economic indicators that are especially relevant to the manufacturing industry.

- The Bank of Canada forecasts 2024 GDP growth to be 1.5 percent and about two percent in 2025 and 2026.
- Inflation is easing across the country as monetary policy has helped to slow growth and reduce excess demand pressures. Inflation is expected to ease below 2.5 percent in the second half of 2024 and down to two percent in 2025.
- As of June 2024, the S&P Global Canada Purchasing Manager's Index (PMI), reflecting the prevailing direction of economic trends in the manufacturing and service sectors, was unchanged at 49.3. This indicates a continuing downturn in manufacturing for 14 consecutive months. A PMI above 50 indicates expansion.
- The Canada Manufacturing New Orders Index indicates the number of new orders from customers of manufacturing companies[1]. In May 2024, it was 72.24 billion, up from 71.51 billion the previous month and up from 71.6 billion one year ago. This is a monthly change of 1.01 percent and an annual change of 0.76 percent.
- Canadian manufacturing sales rose 0.4 percent to $71.4 billion in May 2024, driven mainly by higher production in the aerospace product and parts industry group (+11.2%), followed by higher sales in the food (+1.4%) and paper (+5.5%) product subsectors.

Manufacturing in Ontario: The engine of the economy

- 37,550 companies
- 787,100 jobs
- 11 percent of the provincial GDP
- 80 percent of merchandise exports
- 26 percent of total employment (including direct, indirect, and induced impact)
- Almost 45 percent of Canada's manufacturing output

(Manufacturing Ontario's Future, Canadian Manufacturers and Exporters)

Given the implications of current economic indicators and industry trends on business strategy, this report delves into what southern Ontario business owners and leaders in various manufacturing sub-sectors have to say about the challenges they're facing — and how they're dealing with them.

Biggest challenges — and best remedies

Finding good employees

Every manufacturer at the MNP roundtables cited the difficulty of hiring good employees. They also emphasized that by good, they don't mean highly skilled with the capabilities their company needs. They mean people with a strong work ethic. Those who can be counted on to show up, learn, and get the job done.

"You can't train that into people. They either have it or they don't," says Dan Engelage, president of D&R Custom Steel.

Statistics Canada reported that in 2023, nearly half (48.4%) of manufacturing businesses expected recruiting skilled employees to be an obstacle.

According to employment agency Randstad Canada, a major challenge for Canadian manufacturers in attracting good workers is that manufacturing is one of the country's lowest-paying sectors.

From the employer's perspective, many find they can't compete with larger companies on wages and benefits.

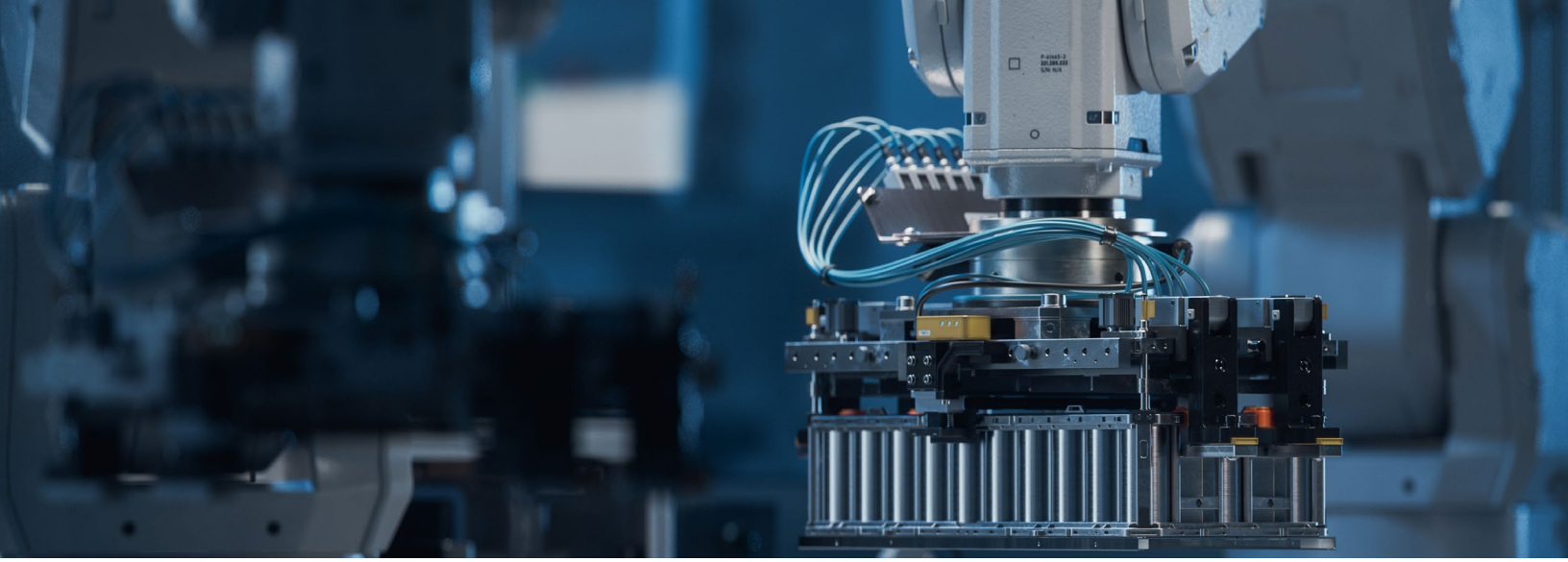
Offer appealing non-monetary benefits

Manufacturers say younger employees consider employee benefits an important part of their compensation package[2]. Among those benefits that workers consider to be important:

- Flexible schedules
- Career advancement
- Skills development
- Extra paid vacation
- Healthcare and dental benefits
- Childcare benefits
- Group life insurance

Along with technical tools to perform their jobs well, employees also want tools to optimize their well-being[3]. This is among the reasons they value and use employee benefits: massage therapy, mental health support, naturopaths and more.

One manufacturer found it helpful to communicate consistently with workers about paths to higher compensation. For example, the company offers two paths. The first is moving to a more senior role or a different role. The second is the annual compensation review and update, which takes place at the same time for all employees. This is also when there are discussions with workers about the steps involved in moving into different roles and the timing of those steps.



Hire on attitude, train on skill

"We try to hire more on attitude than aptitude," says Jim Kranendonk, President of Curtainsider. Other manufacturers concur. Marcel Pantano, CEO of MTD Metro Tool and Die, says, "We used to hire on skill and fire on attitude. Now we hire on attitude and train on skill."

The faster and better employees are trained, the quicker they become assets to a company. Higher retention, innovation, productivity, product quality, safety, and even customer satisfaction are all byproducts of effective worker training[4].

One business owner finds that supporting workers to acquire their accreditation by the Canadian Welding Bureau, while not a requirement for the work performed by his company, means a lot to his employees. "The welder trainees love being certified." Most important, the company's retention rate is high.

As automation in the manufacturing sector advances, so will the need for employees with advanced manufacturing skills. Since workers perceive upskilling and training as a benefit[5], employers should invest in it to support workers' success and highlight this perk when hiring.

At D&R Custom Steel, Dan Engelage says they focus on recent college graduates and apprentices eager to learn the trade. Hired as labourers, new employees have three to six months to demonstrate capability and that so-important work ethic. Then the company guides and supports them in a specific trade.

"You can always train someone to do the technical requirements," agrees Kevin Sun, COO of Maneva AI. "I would much rather hire a good person than a good technical person."

Ensure the right cultural fit

To ensure that a prospective employee will work well in their organization, manufacturers want to know that an individual's characteristics, expectations, and behaviour will align with their organization's values and work style.

Hali Van Vliet, the lead of MNP's HR consulting for private enterprise practice, suggests employers consider cultural fit, including the individuals and teams a prospective employee will be working with and the environment they will be working in. Is this person compatible with the company's culture, goals, and values? With the workplace location and environment? With its people and processes?

She suggests giving prospective employees lots of information about these issues and asking them questions to determine their comfort level.

Mary Larson, National Lead of Strategy Consulting Practice for MNP, also suggests that owners and management teams regularly talk with employees about the company culture. She says organizations need to purposefully build and preserve their culture; a big part of that is repeatedly articulating to employees what they want the workplace to represent.

Be an inclusive employer

"Equity, diversity and inclusion can be a big advantage to employers," says Larson.

For example, Canadian Manufacturers and Exporters say women represent 48 percent of the labour force in this country but only 29 percent of the manufacturing workforce. This represents a significant potential pool of employees.

Five suggestions to attract women toward working in manufacturing

1. More female role models to inspire and encourage young women
2. Access to modern manufacturing facilities to help change the perception of manufacturing
3. Encourage young girls to pursue an education in STEM and/or the skilled trades
4. More inclusive workplaces
5. Creative ways to improve work-life balance for employees

(Untapped Potential, Canadian Manufacturers and Exporters)

To expand the pool of prospects and create an inclusive workplace, Larson also suggests that employers consider workers with physical, learning or communication disabilities. "Most accommodations don't cost much, and employees with disabilities often bring unique perspectives and skills to the team, fostering a positive and collaborative work environment for everyone."

She recommends sourcing employee prospects from college and university immigrant communities by establishing relationships with schools with diverse student bodies. Manufacturers gain access to a pipeline of newcomer talent, while hiring and training immigrants can help to build a workforce that reflects the markets a company serves.

> "When it comes to recruitment and retention, we need to keep talking, challenging the status quo, making things better. It's an ongoing conversation."
>
> – Nafisa Mahdani, Director of People, Culture & Safety, Steelcon

Amping up performance

Manufacturers continually focus on improving their capabilities and performance. They know that what got them here today will not be what's needed tomorrow.

To stay profitable and competitive, these businesses must optimize the effectiveness and efficiency of their manufacturing operation by using resources appropriately, minimizing waste and inefficiencies, and optimizing the manufacturing process.

This includes keeping employees engaged with their work and motivated to achieve targets. Chris Sweeny, Vice President of Swenco, also raises the issue of an aging management team. "We have several employees on our team who have over 40 years with the company. So how do we effectively make use of that organizational knowledge?"

Leaders must focus on productivity and growth

MNP's Hali Van Vliet points out the need for effective supervisors and managers at a high level to enable owners to focus on the health and growth of their company. "We see some owners spending too much time dealing with performance issues when they should focus on productivity and growing the business."

Tony Aziz, CEO of Amir Quality Meats, relates the transformation of the company's management team. "I was very much involved in day-to-day operations a couple of years ago. Since then, we've introduced new ERP systems, new processes and procedures. And we've brought in a productive layer of management: plant manager, director of HR, supervisors, team leaders, line leaders. This makes a huge difference in our productivity. Now we're more profitable, and having a strong team helps us focus on what we need to focus on."

> "We no longer look at hiring managers through a cost lens. We look at this through a lens of productivity, growth, effectiveness."
>
> – Tony Aziz, CEO, Amir Quality Meats

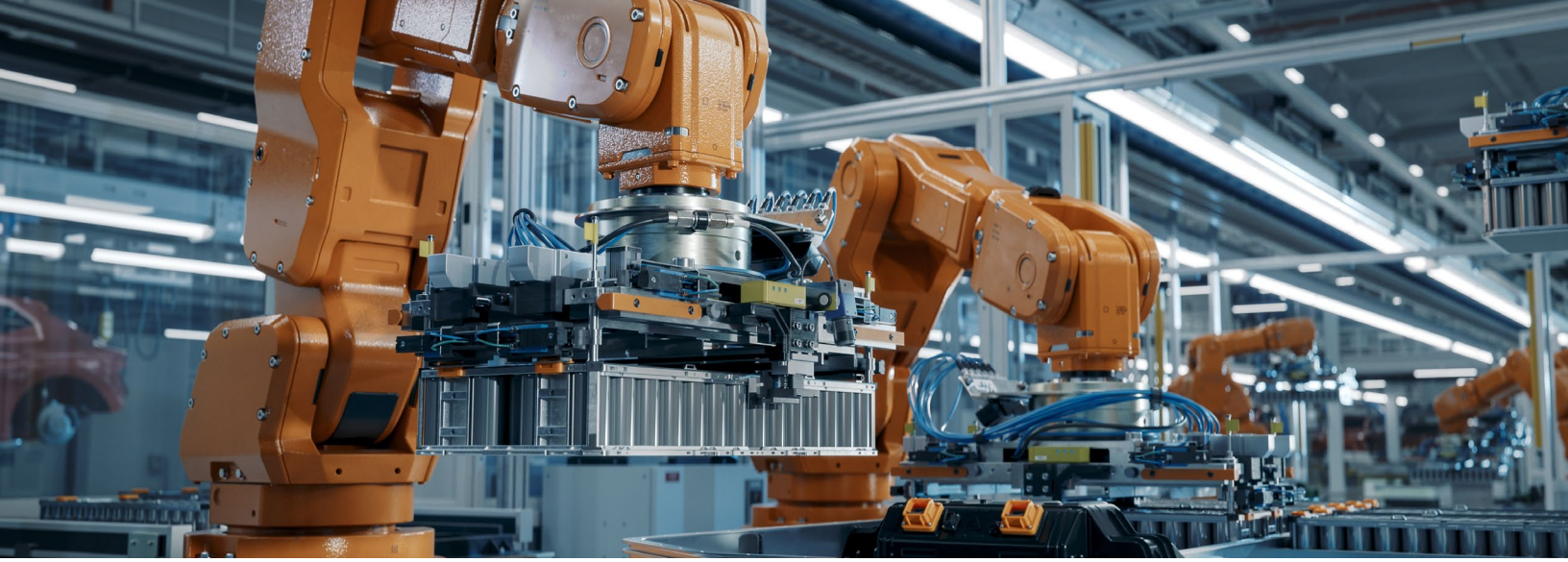
MNP's National Value Creation Leader, Hussam Malek, suggests that "when it comes to productivity improvement, the number one impact is made through active management by management."

Active management is a structured approach to managing and improving performance. This involves developing goals and strategies focused on improving team productivity by promoting engagement and trust, planning and tracking daily performance, motivating through feedback and measuring progress by comparing performance results with goals[6].

Being visible and approachable is another important component of active management. Leaders who walk the production floor daily, like Marcel Pantano of MTD Metro Tool and Die, can significantly impact performance. This simple strategy can strengthen communication, identify problems and opportunities, build morale, and improve employee performance.

Pantano believes it's important to communicate with all employees. "I walk the floor every morning, look at what's going on, and talk to everyone."

The same approach works for Nafisa Madhani, Director of People, Culture & Safety at Steelcon. "We're always on the floor. We share with employees where we're going as an organization and the goals of the day." She says that before management became so visible and vocal, "we weren't really telling people what was expected of them. So, they thought they were doing well. They had no idea what the expectations were. Now they know. Every day."



Attentive, caring supervision is vital

In many manufacturing businesses, there can be a gap between the goals of the owner or senior management team and production performance. Passive supervision is sometimes the cause.

Supervisors need to connect with employees and encourage continuous improvement to achieve goals. Dan Engelage, president of D&R Custom Steel, says employees "want to see that you're on their side. Then they're willing to support you." This requires active supervision on the floor — checking progress, answering questions, solving problems and conducting quality control checks.

A global survey reveals that young employees prefer empathetic managers (38%) to experienced managers (9%). For these workers, honesty and integrity are five times more important than experience. This is followed closely by empathy and caring about team members, plus empowering and motivating.

Madhani says that capable supervision and leadership by example help to reinforce a strong work ethic at the company. Supervisors get to know all the people they manage, so that 'people problems' don't come up as a surprise. They ask questions so they know that someone's father is ill or their spouse is off work. Leaders at Steelcon gather once a week to "learn something new, discuss what's happening and how we can do better."

Performance feedback needs to be frequent

Madhani finds that daily performance feedback is more productive than annual reviews. "We give feedback every day so that at the end of the year, you're not talking about how workers can improve because they already know how to do that. Instead, we're talking about what they want to do next."

One company has a daily operations review — looking at performance metrics on every production line. The management team also holds weekly and monthly planning meetings to ensure targets are being met.

MNP's Hussam Malek suggests that feedback loops must be fast enough to provide timely information to management teams; otherwise, it may be too late to resolve serious issues

Learn more

Feedback loop

A feedback loop collects data on the output of a process and circulates pertinent information to the appropriate people to ensure the process functions optimally. If a process produces a significant number of products with defects, for example, an effective feedback loop would quickly identify this issue and provide the right people with appropriate data to solve the problem, such as altering materials, adjusting machine settings or training workers.

Malek suggests that workers need to be educated regarding what work adds value to the company and what does not. Processing a component, for example, adds value. Having to detour to replace an incorrect part is non-value-added work.

A variety of regular employee communication channels

It's understood that effective workplace communication can increase employee morale, engagement, collaboration, and productivity. But what exactly is effective workplace communication?

First, "People want to know where they fit into the big picture," says Malek. This requires ensuring that workers at every level understand how their individual actions impact the company's success. When change is happening, they need to know what has to change and why and how their efforts contribute to the company's growth and success.

Regarding how manufacturers communicate big and small issues, employee committees, roundtables, and company-wide meetings are popular.

One CEO holds a company-wide meeting every month. They discuss good and bad news, what's new and changing and where the company is heading.

The management team of another company holds toolbox talks and safety talks with employees, sharing everything from new people and products to staying safe on the job.

MNP's Mary Larson says that discussions about safety are particularly well-liked by employees because they demonstrate that the company cares about their well-being.

All of the manufacturers agree that acting on feedback is key when sharing information and asking for input. Sometimes, the request can be very small — like asking for a fridge to chill beverages. While some issues may seem trivial to management, they can be very important to employees.

Well-structured employee roundtables provide valuable feedback

Roundtable participants concur that employee roundtables, when carefully implemented, are valuable ways for employers to hear about their workforce's concerns and ideas. These manufacturers offer the following suggestions to ensure that roundtables are effective.

- Establish a vision and rules for what can be discussed at the roundtables. MNP's Hali Van Vliet suggests clarifying expectations. "It's important to be clear as to what your company can and can't do."
- The right facilitator is crucial to ensure the discussion is productive rather than destructive. One company has an HR director facilitate the roundtables. To help employees feel comfortable during these discussions, this individual is on the plant floor every day, connecting with workers and reinforcing relationships.
- Ensure participants understand these meetings are a safe environment where they can ask questions, state opinions, and share ideas without judgement. Van Vliet says everyone should understand that "people are safe, ideas are not."
- Act on the feedback received.

Succession strategy helps to transition worker generations

MNP's Mary Larson reminds manufacturers of the importance of succession planning in transitioning to a new generation of management and supervisory teams. "You need to set up a way for succession to happen. How are you going to pass along knowledge and skills? How will you integrate new people and experiences?"

An effective succession strategy requires thinking through and taking action, such as:

- Identifying key positions
- Considering potential successors
- Determining the related experience and skills needed
- Establishing workable steps and a timeline[7]

Data-driven decision making matters

For many owners of manufacturing companies, experience and gut feeling have traditionally driven business decisions.

Today, with the pace and scope of business change accelerating, data-driven decision making has quickly become essential for making decisions based on objective, quantifiable information.

At the same time, unlocking the innovation potential of data-driven decision making requires moving from a top-down decision cascade to decentralization. This approach empowers individuals and teams to leverage their expertise to solve their problems.

Decentralization enhances business agility by encouraging data-driven decisions tailored to specific needs. This approach also builds a culture of innovation and continuous improvement[8].

Jason Lee, who leads MNP's digital services practice, points out that data-driven decision making is also important for management teams and succession. "When you have to hand over responsibilities to another person, they don't have the same experience as you have, so they need reliable data to make good decisions, maybe even better decisions, because they're based on facts rather than emotion or intuition."

> "Owners have less and less time to make good decisions. If you make a quick decision on [sub par] data, you'll get a [sub par] outcome. This is why data — good data — matters."
>
> – Kevin Sun, COO, Maneva AI

Leveraging Gen Zs effectively

> "Within a decade, older long-time employees will be gone. So how are we going to prepare for tomorrow? We need to make sure that together, we figure this out and make it work for us."
>
> – Nafisa Madhani, Director of People, Culture & Safety, Steelcon

Mary Larson of MNP points out the significance of Generation Z in the face of Canada's aging workforce. Since Gen Z is a smaller cohort than millennials and baby boomers, a natural reduction in the total labour pool is occurring[9].

Looking at Canada's agricultural sector as an example, a report by RBC indicates that by 2033, 40 percent of Canadian farm operators will retire and a shortfall of 24,000 general farm, nursery, and greenhouse workers will emerge.

So, manufacturers need Gen Z workers, but they sometimes struggle to integrate them easily into their existing workforce.

Roundtable participants mention several areas where Gen Z's expectations differ from those of their traditional workforce. These include valuing their personal time more than previous generations, such as wanting extended vacation or sabbatical time and shorter workdays or weeks. And they want to have their voices heard.

Who is Gen Z, the generation shaping our future workforce?

- Born between 1997 and 2012
- Comprise more than 24 percent of the global workforce
- Projected to hold almost all entry-level jobs by 2030
- Demonstrate distinct characteristics: digital native, open-minded, ethical, entrepreneurial, quick at learning, good at multi-tasking, short attention span
- Hold unique work values: work-life balance, remuneration, job security, corporate social responsibility
- Workplace preferences: jobs that offer work-life balance and employment security, employers that offer training and development, a culture that values individuality, and equality, diversity, and inclusion
- Expected to reshape the future workplace

(FUTURE WORKFORCE PERSPECTIVES SURVEY, Work-Learn Institute, University of Waterloo)

Shorter work week? Absolutely!

Gen Zs want flexibility in their work schedule. In fact, when choosing a job, they rank flexibility as significantly more important (35%) than salary (4%).

A shorter work week is another popular request of all workers. A recent study found that 93 percent of Canadians are interested in a four-day work week.

Two manufacturers found the same reaction when they surveyed their employees. Both companies instituted variations of four-day work weeks for most of their workforce. One offered team core hours of 9 a.m. to 3 p.m. and flexibility to cover night shifts either before or after those hours.

Another has a night shift that works four days a week. "Every weekend is a long weekend and on long weekends, they have an extra day. People love it."

Provide a sense of belonging at work

MNP's Hussam Malek points out that previous generations of workers found spirituality at church, community in their neighbourhood, connections through friends and family, and accomplishments at work.

However, pandemic-influenced, tech-raised Gen Z employees haven't had the same opportunities to establish in-person work relationships over time. This is why many of these young workers often seek all four elements — work, spirituality, community, connections, and accomplishments — from their workplace.

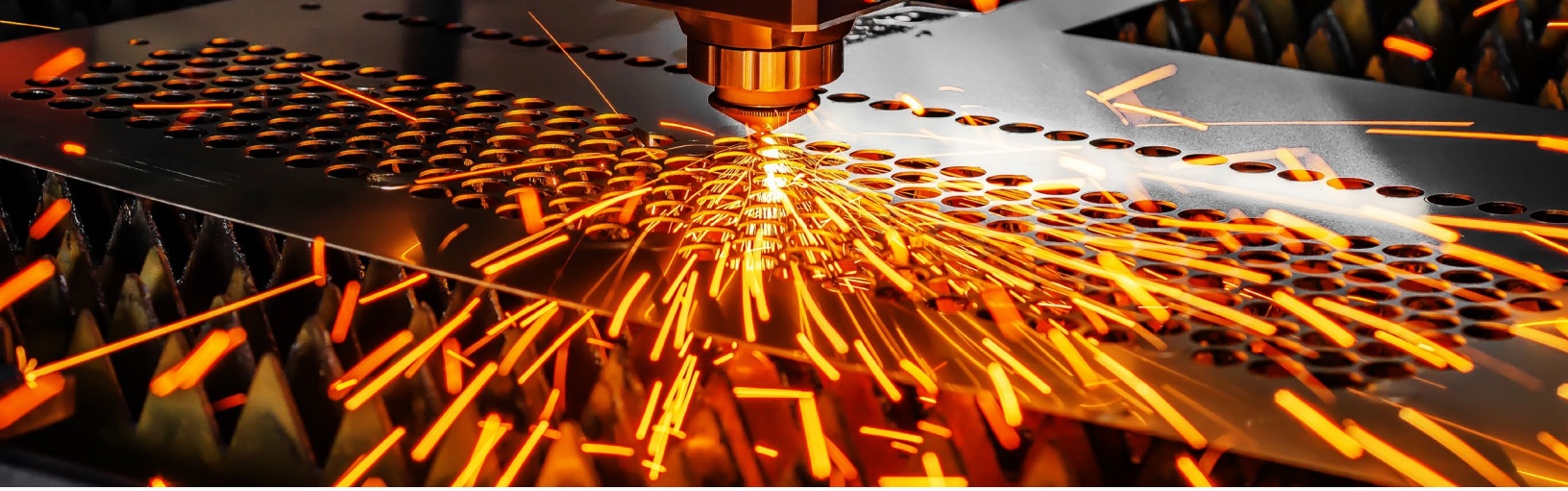
Malek suggests that employers consider how to offer these experiences. For example, can you provide a spiritually enriched workplace that shows collaboration, mutual respect, and a shared sense of purpose? Do you provide a culture with a strong sense of community? How does your company support the local community?

Bring on the tech

Gen Z was born into a digital era and is comfortable with technology. According to CFO magazine , 70 percent of Gen Z employees would leave their jobs for better technology.

They are drawn to workplaces that value innovation, encourage creative problem-solving and leverage technology to streamline processes and gain competitive advantage[10].

> "My teenage son is using a laser cutter and a 3D printer in high school. So, when he goes into the work world, his expectation will be that this type of equipment is now the baseline for technology he will use on the job."
>
> – Pam Lilley, MNP Manufacturing Lead, South Central Ontario



Marcel Pantano, CEO of MTD Metro Tool and Die, says two of the company's Gen Z employees "jumped into our new ERP system last year — without anyone asking them to do it. They quickly became the experts on the system." Their eagerness and aptitude earned them a bonus, a raise and company-wide recognition.

For Jim Kranendonk, President of Curtainsider, his company invests in new technology "to make the operation more efficient but also to invest in our people. The younger generation loves new equipment."

Another owner agrees, offering that younger workers look to technology to make their work easier.

Address worker preferences for learning

Gen Z workers prefer a dynamic and fast working environment[11]. "As a small company, our employees cross-train in different areas," says Florind Molabecirovic, logistics coordinator at Swenco. "They don't have time to get tired of a role."

According to eLearning solution provider Moodle, the following kinds of workplace learning appeal to Gen Z, the generation that has grown up online:

- Multiple delivery methods and different types of training
- Quick bits of information delivered via bite-sized learning modules that can be completed in short bursts
- Image and video-based learning materials
- Soft skills training such as communication, teamwork, problem-solving
- Gamification — gaming strategies that enhance engagement with competitions, personal challenges, rewards and recognition
- Training modules available via mobile devices to enable them to learn at their own pace
- Mental health topics and resources
- Personalized learning plans that set them up for success

MNP's Hussam Malek points out that when employers cater to Gen Z's learning preferences, the result is a more content, more productive workforce that is motivated to achieve their employer's business goals.

> "Providing trainings says to employees, 'My employer cares enough about me to invest dollars in me.'"
>
> – Mary Larson, MNP National Lead, Strategy Consulting Practice

Looking for feedback, but not conflict

Employees who feel heard and valued tend to be more dedicated to their work. This results in greater productivity, job satisfaction, and lower turnover.

Gen Zs want performance feedback but it's important to present it productively. The youngest working generation considers "any sort of poor feedback as conflict," says Malek. This requires being solutions-oriented rather than critical and asking employees to assist in suggesting these solutions.

Gen Z workers also want constructive advice and recommendations for improvement that demonstrate their employer is invested in their success. Malek says it's important to consider the employee's personal goals, know where they want to go, and offer ways to help them get there.

Strengths of Gen Z workers

- They're smart. When it comes to learning, they're lightning fast.
- They are very efficient and get their jobs done.
- They know exactly what they want.
- They challenge managers to think outside the box and adapt. So, they help to build managers with new skill sets.
- Ultimately, we're trying to get to the next level of not having to work so hard. Gen Z will take us there — the next level of where human society needs to be.

What manufacturers have to say about Canada's declining productivity

MNP raised the question with manufacturers about the big problem of Canada's declining productivity.

- According to the Organization for Economic Co-operation and Development, Canada ranks 29 among 38 OECD countries for labour productivity.
- During a presentation to a business group this spring, Senior Deputy Governor Carolyn Rogers of the Bank of Canada referred to Canada's long-standing, poor productivity record as an "emergency.[12]"
- Claude Lavoie, former director-general of economic studies and policy analysis for the Department of Finance, recently commented, "Companies here use less capital and technology, are less innovative, and operate at a smaller scale in an economy plagued by insularity. And it's getting worse.[13]"
- Predicting real GDP per capita growth for 2020-30 and 2030-60, the OECD ranks Canada last[14] among advanced economic countries globally.

Given that lower productivity means lower profits for businesses, stagnant incomes for workers, and ultimately a lower quality of life for all, MNP asked manufacturers for their thoughts about what we, as a country, can do to change this trend.

Adopt smart tech

According to Canadian Manufacturers & Exporters, Ontario manufacturers are slow adopters of advanced manufacturing technology compared with the U.S. Between 2004 and 2021, machinery and equipment investment increased by 34 percent south of the border but fell by 14.8 percent in Ontario.

Dan Engelage, President of D&R Custom Steel, says, "Americans in our industry are much more proactive with technological adoption. When it comes to fabrication shops, robotic laser lines and laser tube cutters and other tech — they invest way more than we do."

The IMD World Digital Competitiveness Ranking measures countries' capacity and readiness to adopt and explore digital technologies as a driver of economic transformation. The latest ranking ranks the U.S. as number one, while Canada ranks number 11.

As another owner of a manufacturing company owner puts it, "We need to properly embrace technology in Canada."

Invest in more R&D

Canada ranks 17 among OECD countries for the percentage of GDP spent on research and development (R&D). And it's one of the lowest spenders among the G7[15].

R&D represents an important investment in developing new ideas, technologies, and processes to strengthen business performance and improve products. MNP partner Ryan Magee comments, "There seems to be less appetite for risk in Canada than there is in the U.S." Roundtable manufacturers agreed that there's more reluctance in Canada to do things differently.

The Expert Panel on the State of Industrial R&D in Canada says this country's low investment rate in R&D is one of the key factors contributing to the consistently wide gap in productivity growth between Canada and the U.S.

More manufacturers need to undertake R&D to successfully compete in a global economy increasingly centred on knowledge and technology.

Strengthen workforce upskilling

The Bank of Canada says being more efficient with our current work contributes to higher productivity. This includes improving worker skills and training, providing better tools, and using new technologies to improve efficiency and output.

Gallup and Amazon's "American Upskilling Study: Empowering Workers for the Jobs of Tomorrow" found that for most workers, upskilling is an important benefit they consider when deciding whether or not to apply for a new job. And 71 percent who participated in upskilling agree / strongly agree that it enhanced their satisfaction with work.

To attract and retain workers, manufacturers should keep in mind that potential employees consider employer-paid training during work hours an important benefit.

More political support, please!

Political will is considered by manufacturers to significantly impact industry productivity. They note that in comparison to their counterparts in the U.S., Canadian manufacturing companies might not receive as many support mechanisms such as property tax breaks, development charge reductions, regulatory benefits, and employment cost reliefs like health and safety. This difference in support could influence perceptions of political backing in the two countries.

MNP partner Hussam Malek points out that manufacturers represent the backbone of the Canadian economy. More than 95 percent of businesses in this country are small and mid-size enterprises[16]. These SMEs employ the most private-sector employees and produce the most private-sector gross domestic product[17].

This spring, the Canadian Manufacturers Association called on the federal government to provide more support to stimulate manufacturing investment and support economic growth. "With manufacturing investment per worker significantly less than half that received by U.S. factory workers, the government must prioritize measures that encourage manufacturers to invest, reinvest, and expand in Canada."

One manufacturer receives calls almost weekly from various U.S. states, offering generous financial incentives to move his company to these jurisdictions. The offers range from a five-year property tax hiatus to reduced building development fees.

Manufacturers believe that stronger political support and targeted policies are needed for the government to become a partner rather than an impediment to productivity.

Discomfort with the Big AI unknown

According to the World Economic Forum, as artificial intelligence advances, "manufacturing is set for a disruption on the scale of the dawn of automation in the 1950s."

With labour shortages, supply chain disruptions and market pressures compelling manufacturers to shift from an "if it ain't broke, don't fix it" approach to integrating advanced technology on the production floor, there are concerns about the extent of its capabilities and potential for disruption.

Four ways AI can transform manufacturing

Optimize productivity using applications such as predictive maintenance to increase equipment efficiency and effectiveness; self-optimizing machine and process parameters; machine vision for automated inspection to improve product quality; and autonomous mobile robots for in-plant transportation.

Improve operational sustainability by predicting future energy consumption and emissions, analyzing and identifying equipment responsible for excess energy consumption and emissions, and determining optimal process parameters or production sequences.

Enhance flexibility of supply chain management by increasing operational agility and mitigating the impact of external shocks through demand forecasting, network optimization and production planning.

Augment the workforce by supporting employees in their daily work and automating repetitive tasks, enabling workers to focus on higher value-adding activities.

(The World Economic Forum)

Automation and AI reduce reliance on scarce labour, lower costs, increase profits

A few years ago, Swenco redesigned tool-and-die machinery and automated processes — to the point where the company's capacity currently exceeds demand. Vice-President Chris Sweeny says operations can now readily scale, and looking ahead, new laser technologies may further reduce reliance on hard-to-find labour.

With growing pressure to produce quality products for lower costs amid labour shortages, manufacturers are increasingly looking to tech to do more for less and to improve efficiencies.

Kevin Sun, COO of Maneva AI, explains why manufacturing tech is crucial. "If I were to ask my son, 'Do you want to work at my factory lifting 25 kg bags of sugar, 20 times per batch?' He would say no! And that's the problem we're dealing with. Fewer and fewer workers want to do this kind of labour."

Technology also offers customer service benefits, as Marcel Pantano can attest. MTD Metro Tool and Die weld automotive parts. However, manual inspections are only 80 percent successful and minor welding defects can result in an expensive customer rejection. So, the company invested in a machine vision system that delivers 100 percent inspection success. The impact? Zero rejections, big savings, an even bigger increase in customer satisfaction, and higher sales and margins.

> "If I can invest in a piece of technology that might not be the best from an ROI perspective, but it makes my employees' lives much easier on the job, I will do it."
>
> – Kevin Sun, COO Maneva AI

Expand ERP capabilities with AI integration

For most manufacturers, enterprise resource planning (ERP) systems are essential for integrating key functions throughout their operations. But until recently, most of these systems lacked the agility to respond to fast-changing market conditions, could not handle high volumes of data, and could not provide real-time insights.

Now, ERP systems are integrating AI technologies such as machine learning, natural language processing, computer vision, and advanced analytics to enable manufacturers to navigate today's dynamic markets effectively.

AI technologies can power ERP software to analyze vast amounts of data, automate workflows, streamline processes, optimize inventory levels and operational efficiency, and deliver real-time data and insights for fast decision making.

> "When you can make decisions in real-time, versus reviewing trailing indicators, you can be proactive rather than reactive, better able to seize opportunities and avoid dangers."
>
> – Jason Lee - MNP Partner, Digital Services

AI is helping manufacturers move toward real-time consumption and root replenishment. For example, AI vision technology can now monitor output per production line. As the product is being manufactured, the system can automatically subtract raw materials from the warehouse and automatically send a purchase order to the supplier.

Or, if there's a delay on the daily production line, AI can immediately notify the sales department to alert a customer that production has been delayed by a certain amount of time.

For manufacturers with more than one facility, AI can provide managerial insights for multiple locations. For example, Kevin Sun of Maneva AI says artificial intelligence can be used to compare factory performance, even tracking issues such as downtime and recommending fixes.

"Let's say factory B has more downtime than factory A. The AI system can issue a report indicating that 'the response of mechanics in factory B to downtime is 35 percent longer than in factory A. Your cost of downtime is $X. Recommendation: hire an additional mechanic.'"

Instead of managers conducting time-consuming analyses, AI will increasingly digitize data and create relevant — and immediate — thinking points.

AI working as a digital twin on the production floor to conduct QC, optimize ops, save costs

Kevin Sun, COO of Maneva AI, which provides artificial intelligence-powered digital line workers to automate key processes, provides a rundown of digital twin capabilities on the production floor.

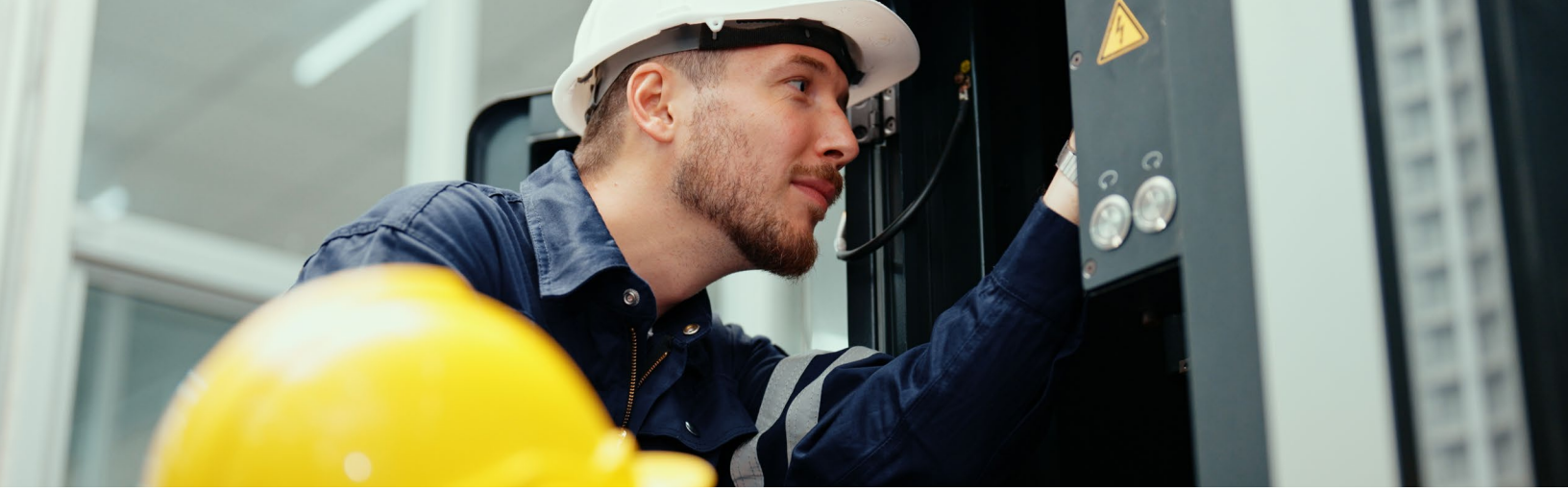
AI has traditionally been about digitizing things — seeing what's in the real world and putting it into the cloud or worksheets. Humans still did the work.

In manufacturing facilities, tasks performed by humans are based on visual understanding — determining if there are anomalies among products, checking if something is missing, etc.

AI and digitization technologies can now create a virtual replica of a system or facility called a digital twin. AI vision enables computers and systems to analyze visual data and derive meaningful information. For example, by tapping into existing security cameras, AI machine vision can capture images of products in real-time, which the AI system analyzes to identify defects, irregularities, or imperfections.

Identifying tasks that may be improved with AI vision and defining how AI applications will integrate with production lines is now possible. For example, unlike a traditional sensor, a digital twin could identify a piece of steel going through production as being off specification and precisely determine whether it should pass or fail. AI effectively plays the role of a senior quality control tech engineer.

Digital twin technology can also enable manufacturers to model, simulate, analyze and optimize production processes, resources and operations. This can help to identify opportunities for cost savings[18].



Subscription models improve affordability

One manufacturer remarked that AI automation and digitization don't have to be a huge investment, even for small manufacturing operations, because monthly subscription models are increasingly available.

Manufacturers can now access entire suites of solutions through subscriptions, making advanced technology more affordable and more accessible to implement than purchasing individual products. There are other advantages, such as maintenance and expert support[19].

Subscriptions provide companies with agility and flexibility, enabling them to scale faster while paying only for the software they use and readily adjusting capacity as needed. Moreover, these models utilize a smaller initial investment instead of paying for technology upfront from the capital expenditure budget.

AI-powered automation eliminates repetitive, dangerous tasks

While several manufacturers say their employees worry about automation replacing workers, the reality is quite different. According to the Future of Jobs report by the World Economic Forum, as many as 97 million new roles may be created by 2025 by adopting automation.

The International Federation of Robotics also reports that fewer than 10 percent of jobs can be automated. Instead of replacing jobs, robots eliminate repetitive and dangerous tasks performed by human workers[20], allowing them to transition to more skilled roles.

And for younger workers, automation is particularly appealing. It enhances their job satisfaction and increases retention.

Employee change management is key for advanced tech integration

Several manufacturers commented on the difficulty of changing employee behaviour to optimize the advantages of new technologies like artificial intelligence.

MNP's Hali Van Vliet emphasizes that increasing employee acceptance and responsibility requires an effective change management process. This refers to a systematic approach to transitioning an organization's goals, people, processes, and technologies.

She emphasizes that communication well before introducing new technology is crucial to encourage employees to accept and adapt to change. This includes early and ongoing communication to explain why the technology is needed, how it supports the business plan, how it will work, what's expected of employees, and how this will impact their work.

Change management communication also involves seeking employees' input. How do they feel about this? Do they have any concerns? How can the company help?

> "Right now, most automation works with one-arm robots. But two-arm robots, which have far greater dexterity, are emerging. When they start scaling in price, AI will be more accessible and completely embedded into our lives."
>
> – Kevin Sun, COO, Maneva AI

Choosing the right tech for the right results

Investing in new technologies can be expensive and time consuming, and sometimes, the results aren't worth the investment. While smart manufacturing — using advanced technologies to strengthen the efficiency and agility of traditional manufacturing processes — is now commonly part of business strategy, manufacturers still struggle with selecting and adapting new technologies to achieve the results they need.

Before one manufacturer found an ERP system that finally helped manage the business effectively, for example, the company went through years of frustration and expenses, even discarding one expensive system because it performed poorly.

Selecting the right technology to meet the needs of the business is complicated by the abundance of options, the time and cost involved, and the speed with which technologies are evolving.

State of Smart Manufacturing

In 2024, manufacturers are focused on using technologies to build resiliency, improve quality, maximize workforce potential, and drive sustainable growth.

- 95 percent are using or evaluating smart manufacturing technology
- 83 percent expect to use generative AI this year
- Top three workforce-related barriers to success:
  - Change management
  - Training employees on updated processes
  - Helping employees stay engaged and feel valued in their roles

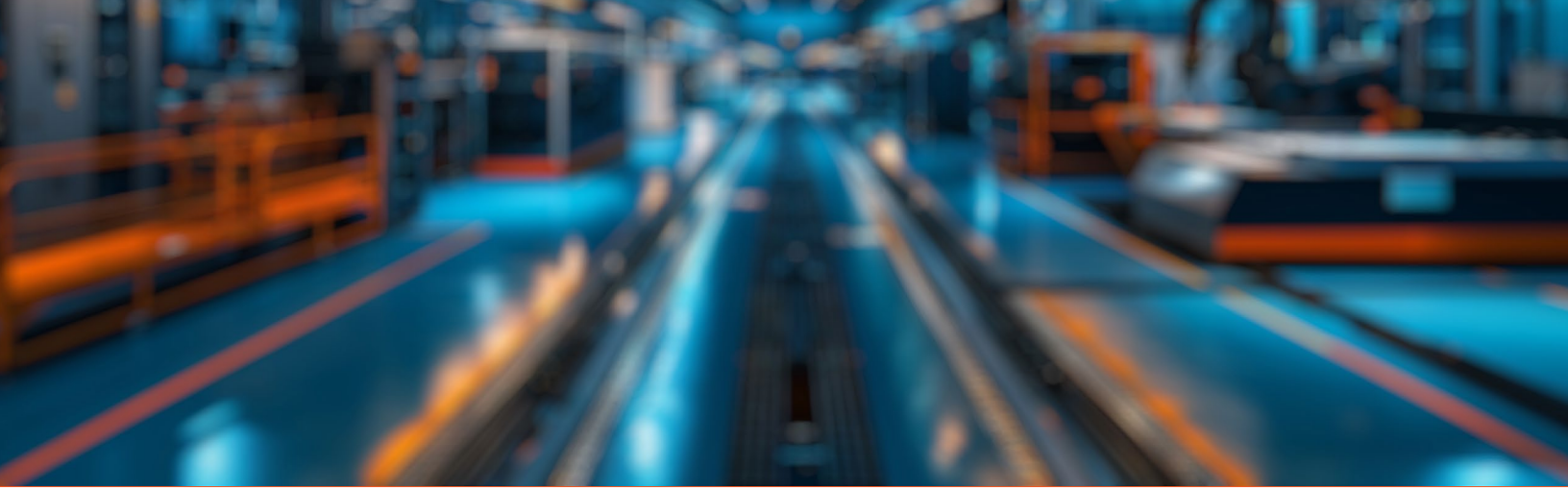
  (Global 2024 State of Smart Manufacturing Report)

Investigate new smart manufacturing options

As the use of artificial intelligence accelerates, the pace of technological change is accelerating and having a transformative impact on the manufacturing industry.

These are the key smart manufacturing technologies companies are adopting, as well as examples of their applications.

- **Artificial intelligence:** An umbrella term for technology enabling machines to perform tasks requiring intelligence to optimize manufacturing processes by recognizing objects and sounds, understanding language, and solving problems[21].
- **Autonomous/intelligent robots:** Smart machines that perform tasks without needing humans to control them. They acquire data from sensors and cameras, processed through neural networks, systems that mimic the human brain. These robots typically perform tasks related to material handling, processing, assembly, inspection, and inventory management that are difficult, repetitive or dangerous, reducing risks to human personnel.
- **Cloud computing:** Cloud-based services, such as servers, storage, databases, networking, software, analytics, and intelligence that support manufacturing operations and processes[22].
- **Computer vision:** Enables computers to understand and interpret visual information from images and videos to improve inspection, quality control, sorting, and process automation[23].
- **Data analytics:** Tools that analyze data on production processes, supply chain management, and customer behaviour to identify areas for improvements and cost reduction.
- **Digital twins:** Software models that are exact replicas representing the attributes and operating behaviour of specific production lines, machinery, end products, or "real world" scenarios within a production process. These are maintained in a database through real-time updates. These virtual representations enable manufacturers to make quick production decisions by providing a real-time view of what's happening now and in the future[24].
- **Internet of Things (IoT):** Networks of interconnected machines, tools, sensors and software that collect and share data to enhance efficiency, productivity and safety by supporting predictive maintenance, asset tracking, inventory management, quality control, production process monitoring, energy efficiency and supply chain optimization[25].
- **Machine learning (ML):** Enables machines to optimize inventory levels by analyzing data and detecting patterns and trends that deliver forecasts of future demand[26].
- **Predictive analytics:** Analyzes historical data to reduce downtime by, for example, maintaining production schedules, minimizing rush orders, and reducing energy consumption and repair costs.



Plug-and-play, no code automation, making tech integration easier and more affordable

As factories continually upgrade and technology evolves, AI, IoT, big data, autonomous robots and other developments will transform manufacturing.

Traditionally, technology applications have been offered as isolated solutions, presenting significant obstacles for manufacturers. But now, plug-and-play models are rapidly emerging. With components that are standardized and easily integrated into existing systems, this modular approach facilitates quick installation, compatibility with existing infrastructure, and easier user training.

Six takeaways to effectively leverage innovation and technology

All manufacturers at the MNP roundtables agree that innovation is essential to gaining a competitive advantage, responding to changing customer demands, accelerating turnaround, and reducing waste and costs, regardless of industry sector or organization size.

When contemplating introducing a new technology, start by prioritizing tech choices based on their potential impact on business objectives. With this foundation, Jason Lee on MNP's digital services team, offers the following takeaways for manufacturers to consider when leveraging technology to innovate.

1. Determine the ROI[27]

To establish whether a technology investment is worthwhile, Lee suggests assessing the total investment and the potential return on that investment. These questions can help guide your decision-making.

- What problem does this need to solve?
- What outcome do we want to achieve?
- How does this technology drive results?
- What is the potential impact on our business, employees, and customers?
- What key performance indicators (KPIs) will determine success?

2. Focus on resiliency

To remain competitive, manufacturers need to anticipate and respond to change. Advanced digital technologies such as AI, which enriches data and analytics, provide real-time insights that make the value chain more resilient and sustainable.

The pandemic highlighted how manufacturers that reacted quickly and utilized advanced manufacturing technologies were able to generate new opportunities. Today, with constant disruption in the industry, digitalization and automation are crucial.

Lee says manufacturers should always ask, " How can we innovate, automate, optimize, and develop predictive capabilities?"

3. Data quality is key

Before leaping into AI, Lee cautions, "Keep in mind that the risks of AI are often associated with "data garbage in, data garbage out."

Data is at the heart of manufacturing decision making. Yet management teams looking to leverage their data to use AI often discover that poor data quality is a major obstacle to achieving optimal results.

Lee says that while maintaining data quality may be challenging given its growing volume, it is essential. He suggests the first step toward using these technologies is to evaluate and improve, when necessary, the quality of the data that you will be using. This is essential to ensure your organization makes the right data-driven decisions.

4. Getting started doesn't have to be complicated

When it comes down to utilizing AI effectively, Lee says it doesn't have to be complicated. It's simply about "how do we make this more efficient, more automated, more predictive, more optimized."

He suggests bringing together a small team and including external experts to gain a fresh perspective on the best ways to develop AI solutions for specific manufacturing issues.

5. Technology governance is essential to reduce risk and achieve goals

Governance is critical for advanced technologies such as AI to ensure they are deployed responsibly, securely, and ethically. The article Maintain control with an AI and data governance framework outlines MNP's suggested best practices for AI and data governance.

As organizations increasingly rely on technology, strong governance adds value by ensuring this tech mitigates risks and supports business goals.

The Future of Manufacturing: Five Global Trends

Optimization with digital tools such as cloud computing, automated coding, and vision inspection systems to improve efficiency, reduce waste, and increase resilience.

Operational resilience using automation for a range of production processes.

Collaboration for scalability and sustainability: economic and environmental sustainability solutions will require working with individuals, businesses, and institutions to drive progress on common goals.

Greater interaction between manual workers and digital tools: an MIT study found that human-robot teams can be up to 85 percent more productive than either humans or robots alone.

Predictive manufacturing uptime monitoring represents a shift in service and support from 'break-and-fix' to predictive uptime monitoring and proactive quality improvement.

(The Manufacturer)

> "Increasing your technology and automation is key to staying in the game."
>
> – Marcel Pantano, CEO, Metro Tool and Die

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About MNP

National in scope and local in focus, MNP is one of Canada's leading professional services firms — proudly serving individuals, businesses, and organizations since 1958. Through the development of strong relationships, we provide client-focused accounting, consulting, tax, and digital services. Our clients benefit from personalized strategies with a local perspective to fuel success wherever business takes them.

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