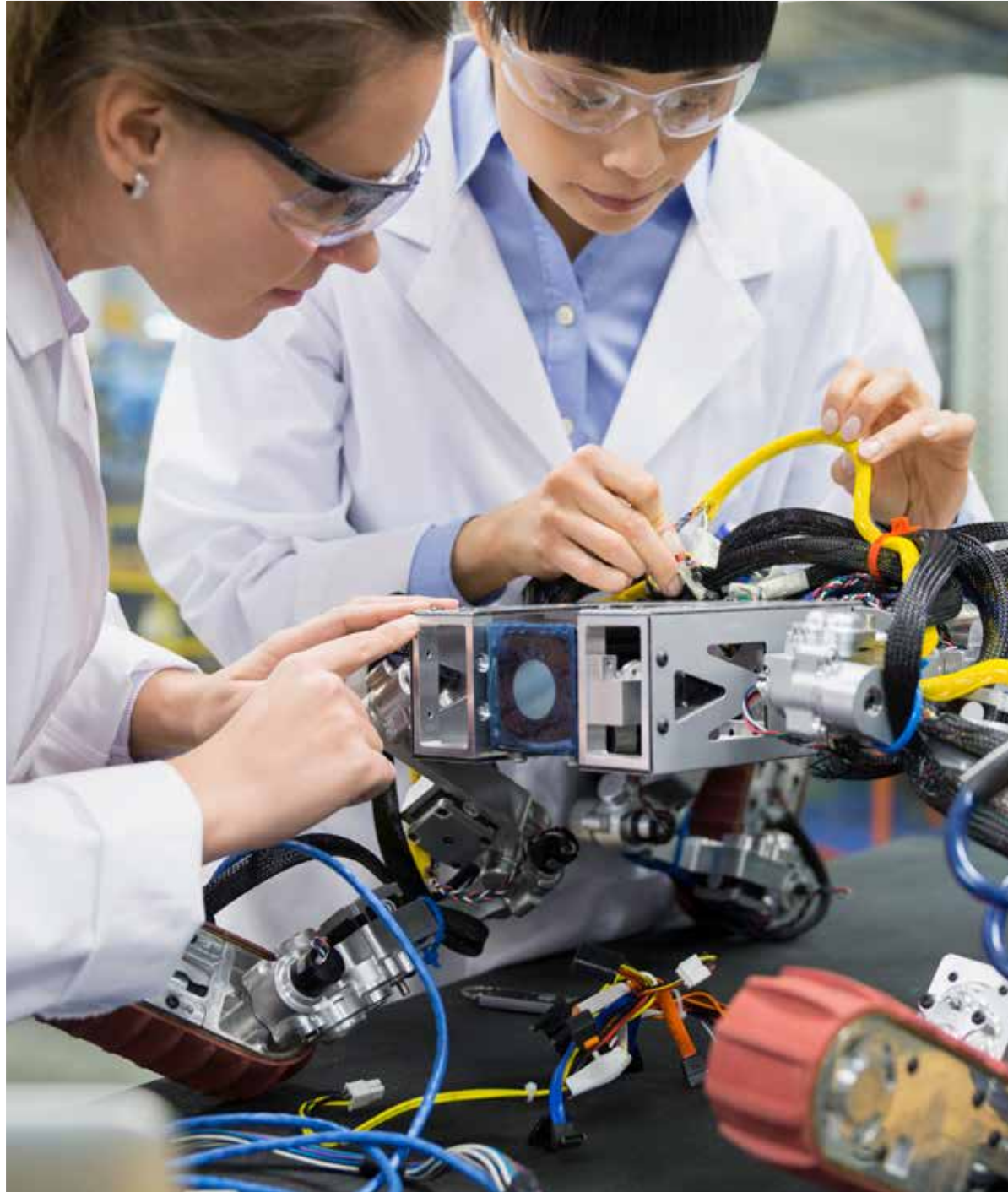


Industrial manufacturing trends 2019

External conditions pose questions.
Could technology be the answer?

Part of PwC's 22nd Annual Global CEO Survey trends series





Technology could become like oxygen to the industrial manufacturing sector

For the industrial manufacturing (IM) sector, a series of external challenges ultimately may be catalysts for action that the industry has avoided for many years. Global trade disputes, tariffs and trade barriers, political instability and even the potential onset of a recession are topping a long list of threats that could have palpable repercussions for companies that make complex engineered products and equipment mostly for manufacturing operations and earth-moving projects.

87%

of CEOs that were 'extremely' concerned about trade conflicts, cited the US-China as a specific trade conflict they were concerned about.

Protectionist trade policies have a particularly strong effect on this industry, which often does business across national borders. In the US, steel and aluminium tariffs and levies placed on more than US\$200bn worth of Chinese goods — which, in turn, led to retaliatory actions from China — have increased IM materials costs and squeezed margins. The sector's supply chains also are feeling the tariff pinch, which makes it more challenging to determine locations for factories and sources of supply. In Europe, the uncertainty of Brexit negotiations is having a similar effect. Citing these events and the nationalist rhetoric of some recently elected governments, many economists are predicting slower growth, perhaps negative growth, over the coming months and into next year. Translated into industrial decisions, recessionary predictions like these can lead to expectations of

increasingly cautious customers and an overall slowdown in manufacturing and construction projects.

The depth of these challenges has not been lost on the sector's CEOs. According to the results of PwC's 22nd Annual Global CEO Survey, government policy worries were top of mind for IM leaders (40%), with trade conflicts a close second at 39%. The trade tensions between China and the US, in particular, were viewed as a notable threat, with 87% of IM CEOs who were extremely concerned about trade conflicts, cited the US-China trade conflict as a concern.

Industrial manufacturers are not used to dealing with these types of global headwinds. For decades, free trade has allowed them to create interwoven supply chains around the world relatively unhindered. These stable supply chains

provided a privileged upstream position from which these manufacturers could use labour arbitrage to keep product prices and production costs down while providing more customer-friendly add-ons further downstream, such as the Internet of Things (to monitor and gather data), real-time tracking (for shipments) and other platforms (for omnichannel customer engagement). However, with these advantages and decade-long product life cycles, there was no real sense of urgency for IM companies to seriously invest in significant internal operational improvements that would, for instance, fully modernise their factories and create a seamless network that included product design, procurement, production, warehousing and shipping.

Consequently, many industrial manufacturing companies have not implemented digital tools across their

business lines that would give them a low cost and lean operating environment flexible enough to respond quickly to geopolitical and global economic challenges. An ideal digital plan should cover three primary aspects of the IM landscape: 1) customer-facing activities, including connected products and services; 2) core operations, including digitised product development, smart factories (Industry 4.0) and transparent networked supply chains; and 3) supporting operations, such as customer service, sales, HR and accounting. Of these, IM companies have succeeded primarily in their involvement in customer-facing activities, adding a raft of digital components to products and services.

But with their uncertainty about global conditions growing, CEOs in our survey conceded that they will have to look inward to protect revenue. In fact, 81% of IM CEOs said that they plan to rely on operational efficiencies to bolster growth via enhanced competitiveness. That's a good sign — in today's world, operational efficiency is essentially a proxy for digitising internal operations, creating scale and value from advances such as artificial intelligence,

robotics and connectivity technology through all facets of the industrial manufacturing ecosystem.

Given the challenges, technology should become like oxygen to the IM sector. Even debt-burdened companies that are forced to restructure and reduce costs in this new environment could benefit from implementing technologies to build more elasticity into their factories, supply chain and manufacturing footprints. Here are some ideas for how this process could play out.

Digitise wherever and whenever possible

Until now, few IM companies have scaled beyond the pilot or exploratory phase of advanced plant digitisation, in part because it requires a level of investment that they are reluctant to make in technologies and digital innovations they don't always fully understand. As a result, most of the digitisation programmes have been piecemeal, with companies running a couple of pilots that tend to be disjointed or insular. Beyond finances, an even bigger barrier is culture. Many IM companies have a traditional engineering mind-set that's risk

averse and less conducive to large-scale internal process innovation.

Some of this resistance is understandable. Technology in most IM organisations is fragmented, and the sheer complexity of connecting machines from different vendors on a shop floor, where numerous information technology and operational technology systems may be in use, is a headache that many companies would prefer to avoid. Multiple plants and tiers of suppliers, each with decentralised software platforms, particularly among conglomerates that have made numerous acquisitions, further amplify the difficulty. For these reasons, no real leader in digital transformation has emerged yet in the industrial manufacturing sector. Apparently, few want to be early adopters and risk investing in the wrong areas. Many are watching their peers' activities while dipping their toes into digital as they wait again for industry growth prospects to improve and the return on digital innovation investment to become clearer and proven.

That said, some industry leaders appear to be making moves in the right direction. France-based Safran, for example, which

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1. Customer-facing activities
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3. Supporting operations, such as customer service, sales, HR and accounting



makes equipment for the aerospace industry, has streamlined its production lines with a digital projection system as a guide workers use to position engine components and parts for assembly, while robotic arms hold and rotate the engine so that it is always at a perfect alignment to accept the next component. In addition, Safran has created an assembly process for turbine blades that is entirely automated from raw casting to finished part. Safran also deploys ‘cobots’ (collaborative robots) on several lines, combining people-specific skills such as analysis and decision-making with the brute strength and precision of a robot.

Germany-based Bosch, an industrial products manufacturer for the automotive industry, has gone even further in digitising its internal operations, with automation tools supporting workers every step of the way, starting at procurement and ending at shipment logistics. Bosch has set a goal of attaining €1bn (US\$1.13bn) in cost savings from this effort by 2020.

Even smaller digitisation programmes can yield significant savings. In a recent

analysis for an IM customer, we found several inefficiencies in the manufacturing process that could be tackled with digitising tools, creating more transparency in places where bottlenecks exist. Implementing automation and AI where it’s easiest to roll out – in certain administrative roles such as HR, accounting and compliance – would also help to ease the pressures of an increasingly tight labour market. Our conclusion was that with these improvements, the company could claw back the equivalent of 10% organic growth in operational efficiencies alone.

Strengthen the supply chain

Creating a digital twin of the supply chain – a digitised replica of the interactions between a company and its suppliers – would be a valuable way to analyse and monitor supply chain performance. Using this window into the supply chain, real-time assessments can be made about the most cost-effective and reliable sources of supply at any given moment, as well as the most optimal global footprint design. With a digital twin, the supply chain goes from being a

somewhat abstruse and difficult-to-control aspect of the business to a clear and open network that can be continuously managed on the basis of external and internal conditions for the best return to the organisation. Although wholesale change to the manufacturing footprint would not be advisable in this uncertain climate, leveraging technology for an adjustment and realignment of distribution points is critical.

Digital twins also can support critical proactive steps to shorten the supply chain. Greater proximity to a local parts and components base could make it easier to manage and plan production and output, resulting in less inventory and more rapid response capabilities. This is especially important now that the combination of higher global wages and tariffs is dissipating the relative cost advantages of overseas manufacturing.

And when there is confidence that the supply chain is managed for maximum

efficiency and stability, IM companies can make better financial decisions without worrying that a supply chain disruption will waylay their strategies. In this regard, important choices must be made about pricing strategy when tariffs are imposed — how much of the new duty can be passed along to customers without hurting the overall business — as well as ways to avoid the full weight of tariffs with new supplier relationships and tax offsets.

And don't forget the customer

Even as they look inward, industrial manufacturing businesses need to recognise that their customers are increasingly expecting more reliable, transparent and efficient B2B relationships. Digital tools and innovations can enable an improved customer experience, such as through blockchain-based traceability solutions, more deeply integrated and configurable price quote portals or even product-as-a-service (PaaS) offerings in which smart products are monitored and

maintained by the producer. An example of this is Honeywell's Customer Experience Center, where potential customers can try out the latest equipment in simulated factories and mock remote sites. Purchases can be made or saved for later through touchscreen and e-commerce portals throughout the facility. IM companies that are not willing to go as far as Honeywell should develop a unified set of websites and catalogues which, as basic as it sounds, is not yet the standard among most industrial manufacturers.

For too long now the IM industry has ignored its own house. But the current external challenges create an opportunity to do something about this. Executing large-scale transformation will take commitment as well as funding that's protected against the pressures of quarterly earnings reports. It also will require a shift in mind-set and a more agile organisation. There is the added challenge of finding the talent to drive these changes, as well as the unintended

consequences — such as increased cyber risk exposure of digitally enabled products and more decentralised supply chains — to consider.

But the risks of not moving forward with advancing technology are even greater. Industrial manufacturers can no longer count on stability. With the stroke of a pen or the tap of a tweet, cost advantages from manufacturing in a particular country or sourcing from certain suppliers can disappear. By finally becoming more proactive about investing in the technology that's needed for the processes and products of the future, the leaders of this industry can get out in front of new global realities and stop reacting to problems they can't control.

Strategy made real

As an industrial manufacturer, what changes should I consider for this new era of tariffs and trade barriers?

You are probably already feeling the impact. Levies of more than US\$200bn on goods from China to the US, costs associated with the newly inked United States–Mexico–Canada Agreement and changes in other global trade partnerships are negatively affecting the existing supply chain practices of industrial manufacturers. The prices and availability of some products are becoming harder to predict as global trade policies and practices remain in flux.

Many industrial manufacturers that have exposure on multiple levels of the supply chain are reporting pressure on their bottom line. In the second quarter of 2018, for example, the Canadian steelmaker Stelco said tariffs had cost it about US\$8.45m; at the end of 2018, Stanley Black & Decker reported a US\$50m increase in quarterly costs as a result of them; and United Technologies said it expected to shave 15 cents per share in 2019.

But there are multifaceted solutions for navigating this tumultuous trade landscape and recalibrating the manufacturing footprint. Broadly speaking, as an industrial manufacturer, you will need to reevaluate where to buy and sell goods and take a hard look at whether some businesses will even be viable under the new trade regime. Look for new opportunities that can be leveraged and consider whether to pass increased costs along to customers or simply absorb them.

Stanley Black & Decker is already working to trim US\$250m in operating costs, while General Electric is looking to credits for exports to China to offset as much as US\$400m a year in impact from current and proposed tariffs. Lincoln Electric, a maker of welding equipment, is opting for surcharges instead of permanent price hikes, as it's not yet clear how long the specific tariffs that are affecting its business will be in place.

Other strategic steps that can be taken to prepare global trade shifts include:

- doing an analysis that projects different scenarios based on both existing and prospective trade policies, including tax structures, logistics and capacity constraints
- prioritising actions over a multi-year timeline, whether that involves changes to the supply chain or passing along costs to customers
- building in mechanisms to ensure supply chain agility and flexibility for the long term
- dedicating a team to manage the cross-functional impacts of these trade policy changes
- rigorously cataloguing the origin of all imported materials and their values
- communicating with customers to determine their willingness to switch to new products, sell products at a higher price or even redesign their business model.

These solutions are multi-pronged and will require the immediate attention of all members of the C-suite, who will need to rethink everything from M&A strategy to product development. The chief procurement officer needs to consider whether existing vendors and suppliers are able to meet cost reduction targets, while the chief market officer should be looking at the price pain points of the customer. Business unit leaders need to get granular about automation and data flows to increase margins and ask themselves whether they have the right talent to manage this new global trade era. And industrial manufacturers need to consider these points quickly.



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About PwC's 22nd Annual Global CEO Survey

PwC conducted 3,200 interviews with CEOs in more than 90 territories. There were 280 industrial manufacturing (IM) respondents, and 26% of IM CEOs reported an annual revenue greater than US\$1bn.

Notes:

- Not all figures add up to 100%, as a result of rounding percentages and exclusion of 'neither/nor' and 'don't know' responses.
- We also conducted face-to-face, in-depth interviews with CEOs and thought leaders from five continents over the second half of 2018. The interviews can be found at ceosurvey.pwc.
- Our global report (which includes responses from 1,378 CEOs) is weighted by national GDP to ensure that CEOs' views are fairly represented across all major regions.
- The research was undertaken by PwC Research, our global centre of excellence for primary research and evidence-based consulting services: www.pwc.co.uk/pwcresearch.

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