GLOBALIZATION: STAYING AGILE IN THE FACE OF WORLDWIDE MANUFACTURING CHALLENGES

By David Holthaus

Whether expanding into new, growing markets or sourcing raw materials from faraway countries, businesses are increasingly operating in a global environment that can be rewarding but at the same time risky. Nimble businesses that are prepared to adapt to the challenges of doing business in an unpredictable world can succeed, say several we spoke to.

Despite supply chain challenges, cultural barriers, and a worldwide pandemic now in its third year, Lithoz GmbH, the Vienna, Austria-based maker of ceramic 3D printers, announced in April an installation at a technical university in South Africa. The company, only 11 years old, now does business on every continent except Antarctica, says CEO Johannes Homa.

“We were born a global company,” he says. “From the very first day, we were looking into the world.”

That’s an essential vision in the interconnected economy of the 21st century, but the hurdles to achieving it can be high.

PRESSURES ON GLOBAL MANUFACTURING

The most recent Global Manufacturing Purchasing Managers Index from J.P. Morgan cites the pressures affecting production and trade around the world. The Index is an overview of the manufacturing sector based on monthly surveys of more than 10,000 purchasing executives from 32 of the world’s leading economies, including the U.S., Japan, Germany, France, and China.

The three stressors are interrelated, creating a global perfect storm. Average purchase prices for materials and supplies rose to one of the highest levels of the past 11 years, the May report says. “Stretched global supply chains contributed to the price inflationary pressure, with vendor lead times again lengthening to a near-record degree,” it adds.

In its global outlook for manufacturing in 2022, consulting firm Deloitte found solid reasons for optimism: Industrial production and capacity utilization surpassed pre-pandemic levels in midyear 2021. The year ended with strong increases in new orders for all major manufacturing sectors, it adds, signaling continued growth in 2022.

But these positive economic indicators come with what the firm says are “historic labor and supply chain challenges.” The most pressing among these are workforce shortages and supply chain instability, both of which can reduce operating efficiency and profits. This turbulent marketplace will demand “business agility” to succeed, Deloitte says.

AGILITY BRINGS STABILITY AND OPPORTUNITY

Pittsburgh-based HarbisonWalker International is the largest producer of refractory materials and services in North America. Although it is primarily based on this continent, it has longstanding operations in Europe and Asia, and the company traces its founding to the United Kingdom in the early 20th century. For HWI, agility means both stability and opportunity.

“We tend to go where our customers need us,” says Carol Jackson, HWI’s president, CEO, and chairwoman. “Sales opportunities are global.” The company also sources raw materials for its products from China, South America, and other parts of the world.

Elected CEO in 2017, Jackson has a long career working internationally in the chemicals, glass, ceramic materials, and specialty steel industries, having been director of global raw materials purchasing at PPG Industries, as well as other roles. She is also the immediate past president of the World Refractories Association.

She emphasized HWI’s agility, even in the current environment. “We have the ability to be that first and only call for our customers,” she says. “We’re there at a moment’s notice.”

The company serves industrial customers in the steel, glass, petrochemical, energy, cement, and many other sectors, where quality, consistency, and reliability are demanded. Although the global supply chain is stressed, HWI’s longstanding relationships with its suppliers helps.

“We have a very stable supply chain that we’ve worked long and hard to develop,” she says. “We’re a good customer to our supply base. As a result, we tend to get earned, preferential treatment.”

Supply chain instability was one of the five global manufacturing trends to watch this year, according to the Deloitte experts. “There’s no mistaking that manufacturers face near-continuous disruptions globally,” the report says.

High demand, rising costs of materials, and now, with a war in Europe contributing to a rapid rise in fuel costs, “The entire supply chain for every commodity from beginning to end is stressed,” Jackson says. “That means inflation.”

MAKING DECISIONS DESPITE UNCERTAINTY

Rising costs are just one of the challenges Schott AG is encountering as it expands globally. Mainz, Germany-based Schott, a multinational company specializing in manufacturing glass and glass-ceramics, has long had a global footprint. It is currently represented in 34 countries, with around 17,300 employees working at 56 locations around the world.

“We are constantly monitoring markets, and we invest in areas where we see potential for sustainable growth,” says Schott spokesperson Neda Jaafari.

The main challenge to its global expansion is the nature of the VUCA world, Jaafari says. VUCA is shorthand for managing in a business world that has become Volatile, Uncertain, Complex, and Ambiguous.
"We have to face new challenges such as geopolitical developments, which means that we have to make decisions despite a degree of uncertainty," Jaafari says.

In this VUCA environment, Schott is moving forward with its expansion plans.

In March, the company announced an investment of 76 million euro at its production site in Lukácsháza, Hungary. The company is planning to build new production capacity for its prefillable glass syringes. Typically, new drugs enter the market in vials, and single-use syringes are used to extract and administer them. But looking ahead, these drugs may be stored in syringes that are prefilled with the medication, simplifying the injection process for health care workers and increasing the dosing accuracy for patients, Schott says.

The expansion in Hungary "will greatly benefit the global market and strengthen supply security for major pharmaceutical companies and contract manufacturing organizations," says Andreas Reisse, executive vice president of Schott's pharmaceutical business unit.

In May, the company announced a similar “double-digit euro” expansion at its plant in St. Gallen, Switzerland, to increase the production of its ready-to-use glass cartridges to administer pharmaceuticals.

In fiscal 2021, Schott invested 350 million euro in expansions. This year, it says it’s planning an investment of 450 million euro, which would be a new high mark for the company. "We are laying the foundation for further profitable growth in the coming years," Jaafari says.

Schott is also moving ahead with strategic mergers and acquisitions. In September 2021, it announced the acquisition of Arizona-based diagnostics company AMI, building its expertise in the booming diagnostics market and strengthening its presence in one of its chief growth markets, the U.S.

Schott says it developed a growth culture internally, as its management has defined principles to succeed in the VUCA world. By applying them, “we were able to create a very resilient organization to overcome these challenges,” Jaafari says.

Along with geopolitical risks, the VUCA world is filled with currency exchange rate fluctuations, rising energy, raw material, logistics costs, strained supply chains, and chip shortages. In just one example of the world’s unpredictability, China experienced power shortages and resorted to rolling blackouts in 2021, further slowing an already disrupted supply chain.
To try minimizing these challenges, Schott management created risk-mitigation plans that are in place. They also continually conduct market analyses and seek customer commitments before investing, Jaafari says.

HWI was also able to operate successfully in the volatile global environment by working to ensure its stability, Jackson says. “We approach everything from a risk-mitigation standpoint,” she says. “We attempt to identify the areas of volatility, and we have contingency plans, or risk-mitigation plans, in place to address those things. You can only control the things that are in your control.”

NAVIGATING THE WORLDWIDE PANDEMIC

A global pandemic that continues to disrupt business around the world was not something most companies would have anticipated before 2020. Now, its impact needs to be included in any business plan.

The pandemic made travel impossible or inadvisable for months. For Lithoz that meant being nimble enough to find ways to install new 3D printer systems in other countries through remote means.

“We had a very good partnerships and well-trained people so we could overcome this,” CEO Homa says.

In August 2021, with COVID-19 travel restrictions in place, Lithoz remotely installed a 3D printer at the University of Wollongong in Australia.

Working with the university and Australian 3D printing provider Objective 3D, the remote installation of the high-resolution ceramic printer was successful. It will be used by the Australian National Fabrication Facility Materials Node, which is based at the university, in a range of applications in the development of bioprinting hardware.

“It has become clear to us just how critical flexibility in the manufacturing world is,” Homa says.

One of the main challenges of doing business in other countries, according to Homa, is understanding different cultures, and different ways of doing business. To do that, “We get local people in local places,” Homa says.

In early 2021, Lithoz set up Lithoz China in Shanghai, a key strategic market in the manufacturing world, and currently the Lithoz base in Asia.

To establish a presence in China to work with its customer and distributors there, Lithoz turned to EOS China, a 3D-printing technology firm that has operated in the Chinese market since 2013. With the collaboration, Lithoz was able to leverage the operations, service resources, and experience of EOS, a provider of 3D-printing technology to manufacturers around the world.
The first international expansion of Lithoz was to the United States. In 2016, the company began looking for someone to run its business in the U.S. and found Shawn Allan in New York. Allan is now vice president of Lithoz America, which not only handles sales and service but also develops specialty applications and materials for its customers, Homa says.

**WORKFORCE AND CULTURE CHALLENGES**

For bigger companies, workforce challenges were an issue for some time. Those challenges can be magnified when looking to grow into other countries. The key is having a strong company culture at the home base, says HWI’s Jackson.

“It’s been my experience if a company is looking to build operations in other parts of the world, the most successful ones are ones that ensure they have strong and consistent work practices and processes and good governance that they can embed and transfer that knowledge into the region they are attempting to grow into,” she says. “The real challenge is how to export a company culture.”

Ensuring that work practices are the same all over the world is important, Jackson says. “That’s one of the biggest challenges in governance and building operations overseas,” she adds.

The scarcity of talent is an ongoing problem both at home and abroad, and it is not expected to improve soon, the Deloitte report says.

Record numbers of unfilled jobs are expected to continue to limit higher productivity and growth, the report continues. Deloitte estimated a shortfall of 2.1 million skilled jobs by 2030 in the U.S. alone. To attract and keep talent, it recommended that manufacturers pair strategies such as reskilling with improving their brand and working with trade groups and others to improve the perception of manufacturing employment.

“It is challenging to find qualified, skilled, technical workers for our specialized industry,” says Schott’s Jaafari. Her company is addressing that by focusing on building up and driving its employer branding, and by collaborating with universities and trade schools on joint programs to attract future talent.

As manufacturers continue to rebound from the shock of the pandemic’s emergence in 2020, they’ll continue to confront new headwinds as they look to expand globally and work with suppliers around the world. Addressing them in an agile way could build resilience for today’s challenges and for whatever obstacles tomorrow may bring.

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**Why manufacturers are eyeing growth**

The following are excerpts from Deloitte’s 2022 Manufacturing Industry Outlook, which was led by Paul Wellener, vice chairman and U.S. industrial products & construction leader at Deloitte LLP. Reprinted with permission. The full report can be found at https://www2.deloitte.com/us/en/pages/energy-and-resources/articles/manufacturing-industry-outlook.html.

**REMAKING SUPPLY CHAINS FOR ADVANTAGE BEYOND THE NEXT DISRUPTION**

Supply chain resilience has been a thread through our recent outlooks, and the challenges are acute and still unfolding.

There is no mistaking that manufacturers face near-continuous disruptions globally that add costs and test abilities to adapt. Purchasing manager reports continue to reveal systemwide complications from high demand, rising costs of raw materials and freight, and slow deliveries in the United States. Transportation challenges are likely to continue in 2022, including driver shortages in trucking and congestion at U.S. container ports.

As demand outpaces supply, higher costs are more likely to be passed on to customers. Root causes for extended U.S. supply chain instability may include overreliance on low inventories, rationalization of suppliers, and hollowing out of domestic capability.

Supply chain strategies in 2022 are expected to be multipronged, according to our survey, including 41% of executives who report their companies will further add or diversify suppliers in existing markets.

Fifty-three percent of surveyed organizations plan to enhance data integration for supply-and-demand visibility and planning. Manufacturers are likely to continue to seek an upper hand by integrating operational data for more transparency and insight in operations. For example, centralizing a manufacturing control tower can bring together data from different facilities, production lines, and equipment and visualize dependencies on suppliers and effects on logistics.
Digital supply networks and data analytics can be powerful enablers for more flexible, multitiered responses to disruptions. The risks from not “connecting the dots” through available data can be significant: A lack of supply chain integration could stall smart factory initiatives for 3 in 5 manufacturers by 2025. Beyond the data, reshoring of components or even final assemblies are likely to pick up steam as global sourcing and low-inventory models continue to diverge. Rising wages and transportation costs globally make nearsourcing or onshoring more competitive at the same time that organizations look to avoid a repeat of 2020–21.

Twenty-four percent of manufacturing executives surveyed are considering moving operations closer to end customers in different regions in 2022. Some manufacturers already in the process of localizing supplier networks in response to tariffs may redouble efforts.

The United States–Mexico–Canada Agreement is likely to continue to drive nearsourcing from China to Mexico. Along with trade, policymakers may further support domestic supply chains. The White House’s 100-day supply chain review in 2021 recommended initiatives and investments to strengthen resiliency in supply chains for semiconductors, large-capacity batteries, critical minerals, and pharmaceuticals.

ACCELERATION IN DIGITAL TECHNOLOGY ADOPTION COULD BRING OPERATIONAL EFFICIENCIES TO SCALE

Manufacturers looking to capture growth and protect long-term profitability should embrace digital capabilities from corporate functions to the factory floor.

Smart factories, including greenfield and brownfield investments for many manufacturers, are viewed as one of the keys to driving competitiveness. More organizations are making progress and seeing results from more connected, reliable, efficient, and predictive processes at the plant. In 2022, 45% of manufacturing executives surveyed expect further increases in operational efficiency from investments in industrial Internet of Things (IIoT) that connect machines and automate processes.

Emerging and evolving use cases can continue to scale up from isolated in-house technology projects to full production lines or factories, given the right mix of vision and execution. For example, one heavy equipment manufacturer has been accelerating convergence of “man, machine, and method” by optimizing performance using sensors to track assets and connecting its machinery to the cloud to enable real-time insights on maintenance. Others have been transforming brownfield facilities with IIoT, robotics, automation platforms, and AI-enabled tools to support production.

U.S. manufacturers have room to run with advanced manufacturing compared to many competitors globally. The number of industrial robots as a share of manufacturing workers in the United States is below countries like Korea, Singapore, and Germany.

Half of executives we surveyed expect to increase operational efficiency in 2022 through their investments in robots and cobots [collaborative robots]. Investment in artificial intelligence technologies is also expected to see a compound annual growth rate (CAGR) above 20% through 2025.

Discrete manufacturing is among the top-three industries expected to invest most heavily in AI, primarily in quality management and automated preventive maintenance use cases. Advanced global “lighthouse” factories showcase the art of the possible in bringing smart manufacturing to scale. Foundational technologies such as cloud computing enable computational power, visibility, scale, and speed.

Industrial 5G deployment may also expand in 2022 with advances in technology and use cases. One global equipment manufacturer invested in multiple private 5G networks to enable automation and intelligence on factory floors as well as to support connected products. Use cases for mobility, such as communication with automated guided vehicles and mobile robots, are likely to complement other edge-computing applications, such as quality monitoring, to increase factory efficiency.