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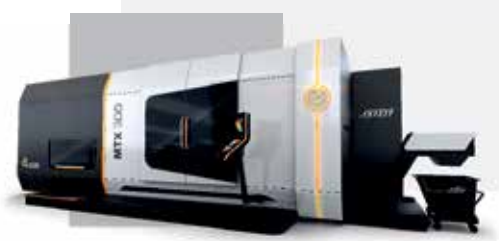

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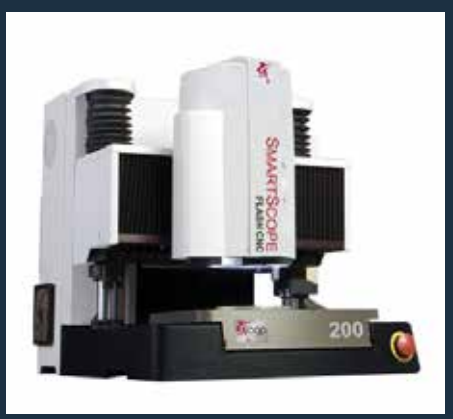

"Commemorating women at their best"

Spotlighting women in Indian manufacturing!

With industries today led and run by women entrepreneurs, India has reached an era where we see women contributing considerably to the Indian economy. Over the last couple of years since the pandemic, the country has seen stories of resilient women coming out of their homes and helping communities with immense strength and courage. They have turned the pandemic into a positive experience, tailoring their skills to fit the new world.

According to a recent survey, out of the eight million workers employed in India's formal manufacturing industries in 2019–20, 1.6 million (19.7%) were women. Such data clearly states the significant influx of women workforce in the Indian manufacturing sector.

Manufacturing has traditionally been a male-dominated industry, but with time, we can clearly see the evolving times. So, this March issue of EM celebrates and embraces the role of women in the Indian manufacturing sector. We are proud to present to you a fully woman-contributed issue where we are celebrating women in manufacturing by giving them a platform to speak about their journey to success and hardships. Our cover story explores the interesting journeys of powerful women in the industry.

Other sections in this issue explore technological breakthroughs in the world of drones in manufacturing, sustainability, titanium machining, tool grinding, MRO Technologies, the role of MSMEs in the defence industry, and why technology needs more women leaders.

Covering such advanced concepts, EM will continue capturing and circulating relevant content, facilitating manufacturing enterprises, and identifying and applying technology upscaling strategies to transition their businesses forward towards a successful 2023.

Team EM

"We are pleased to inform our readers that we are keeping our promise to increase the coverage horizon for both of our magazines. In addition to this, we have also launched some fresh and unique concepts into our online platforms. These initiatives are aimed at providing our readers with an enhanced reading experience and increasing our reach. We are excited to announce the launch of 'Morning Bytes', a weekly industry podcast that aims to provide valuable insights, news, and trends from various sectors catering to both the magazines (EM and A&D). The podcast will be available on our new website and it will help our readers stay informed on the go. Stay connected with our website pi-india.in and check this space for updates/improvements in the near future."

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My being a woman had absolutely no bearing on what I chose to do with my life

– Anna Modayil Mani

Anna Modayil Mani, also known as 'The Weather Woman of India' and the great Indian physicist born on August 23, 1918, originated from Kerala. She retired as the Deputy Director General of Indian Meteorological Department (IMD). In 1875, the Indian government awarded her a Padma Shri, along with various awards and honours for her contribution to science and society, including the G.D. Birla Award for Scientific Research. Mani's work on recording wind speeds in more than 700 locations around the nation established the groundwork for the nation's aspirations for wind energy.

Before anyone knew what the ozone layer did, Mani began her study on monitoring atmospheric ozone in 1960. She created the Ozonesonde, a device that measures atmospheric ozone. The Thumba rocket launch facility also has a meteorological observatory that she built.

Her remarkable journey highlighted her contributions to the field of meteorological instruments, in which she was known to conduct research studies. She has been a publisher of numerous papers focusing on solar radiation, ozone, and wind energy measurements. She started her career at the Indian Institute of Science in Bengaluru. Here, she conducted a spectroscopy research on diamonds and rubies, the findings of which were ultimately published in five research publications and a PhD dissertation. Later, she went on to specialise in meteorological equipment at the Imperial College in London. At IMD, Mani standardised the drawings of about 100 weather-related instruments for production. Her work encouraged her to set up monitoring stations across the country that tracked the solar radiation, which in India was used to harness solar energy. Also, she was in charge of several radiation devices' design and production. Mani was a member of numerous scientific associations, including the World Meteorological Organization (WMO), the Indian National Science Academy, the American Meteorological Society, the International Solar Energy Society, and the International Association for Meteorology and Atmospheric Physics. Mani was awarded the INSA K. R. Ramanathan Award in 1987.

She drew her inspiration from Mahatma Gandhi during the Vaikom Satyagraha that led to the Nationalist movement, and she took to wearing Khadi garments, which became her iconic symbol. Furthermore, she is well-known for her books on solar and thermal. Mani suffered a stroke and died on August 16, 2001, a week before her 83rd birthday.

"Taking Indian manufacturing to the next level"

…says **Rashmi Gururajarao,** Director, Manleo Designs. In an interview with Neha Basudkar Ghate, she talks about the evolving scenario of the precision engineering industry and highlights her company's solutions to address market demands.

What do you consider to be the biggest challenge, & how is your company addressing them?

Changing the mindset of end users like CNC operators/ setters and business owners who invest in tool probes is not a cost or a luxury, but a necessity for survival in today's scenario where input costs are steadily increasing. There is a shortage of skilled labour and the industry is expecting quality processes to be in place as they reduce the acceptable tolerance limits of components, which is the biggest challenge. Our focus is to educate and create awareness among CNC owners, and shop floor staff on the value probes and tool setters can make in their operations as well as their profitability.

How does your company ensure that its products meet the highest standards of precision and accuracy?

Our R&D is built from the ground up, and we start with customer problem statements, which are reflected in our hardware and software programs. Our mission is to have durability and reliability as the core of all our products so that the best materials, processes, and resources are used. We have rigorous quality checks and testing. In the last two years, 70% of our revenue has been re-invested towards R&D and maintaining high standards across the company products. Our machine shop helps us accelerate product development as well as benchmark against available options in the marketplace quickly and effectively.

How do you see the precision engineering industry evolving over the next 5-10 years?

Today, demands from the industry are such that every year tolerance is shrinking, and companies are expected to deliver higher quality at existing or lower prices. This is not possible unless technology is adopted by companies, and they move away from time-consuming and error-prone human-centric methods. Global demand and competition are such that, every technology that enables automation, and quality will be invested in, and given the trust Manleo has built over the last two decades, as well as our customer interactions, and OEM relationships over the last two to three years, we are in a very good position to provide customer-centric solutions that are affordable and reliable.

What is your company's vision going forward?

Our vision is to take Indian manufacturing to the next level, and to that end, we are creating products that address a niche industry or solve a particular burning problem for which there is no affordable solution available today. Our customers as well as industry leaders and top OEMs are sharing the problem statements for which they would like Manleo to develop solutions. To sum it up, we are on a journey of problem-solving, we do not see a point in creating a product that we want to sell, rather, we are creating products that make life easier for the industry and shop floor.

ABB India inaugurates new factory, doubles its Gas Insulated Switchgear (GIS) capacity

ABB India, recently inaugurated its new state-of-the-art factory in Nashik, doubling its Gas Insulated Switchgear (GIS) production capacity. This factory will manufacture both primary and secondary GIS. It will serve customers across various industries, including power distribution, smart cities, data centres, transport (metro, railways), tunnels, ports, highways, and other infrastructural developments. Spread over 78,000 sq. ft., the new site is equipped with smart and lean manufacturing capabilities. It deploys advanced robotics for manufacturing that connects people, processes, assets, and is capable of relaying real-time data for enhanced productivity. The new facility will meet growing demands for power equipment for a 'Resilient and Smart' grid. In line with ABB's Sustainability Strategy 2030 targets, the factory has also realised its RE100 (100% renewable electricity) commitment to achieve low-carbon operations. Sanjeev Sharma, Country Head and Managing Director, ABB India, said, "We use global technology coupled with local engineering as a catalyst for introducing greener alternatives in the market. This new GIS factory is a testimony to ABB's commitment towards building a self-reliant India in manufacturing and contributing to the nation's net-zero journey."

CJ Darcl Logistics selects Netradyne to improve Fleet Safety Performance

CJ Darcl Logistics, has selected Netradyne to provide advanced fleet safety solutions. The engagement provides a fleet of 1,000 vehicles of CJ Darcl with AI-enabled embedded safety technology, helping the company improve fleet operation performance, driver behavior, and theft rates. By deploying Netradyne's Driver•i, CJ Darcl Logistics enhances its fleet management, further builds upon its cost-effective services, and sets new safety standards. The Driver•i system helps the company achieve its goals of improving driving behaviour through automated driver coaching. It also supports expediting driver exonerations as well as handling insurance claims. Nikhil Agarwal, President, CJ Darcl Logistics, said, "Our vision is to train and make the drivers follow the best road practices to avoid accidents. CJ Darcl aims to accomplish zero accidents and to understand and address the areas of concern while driving. Partnering with Netradyne's Driver•i and smart safety dash cams will help to control the driver's distracted sight. We have also conducted certain trials. Hence, it is helping in maintaining the driver's scorecard with other promising results."

Digilogic Systems signs an MoU with ERAP Korea to explore synergies in defence and aerospace

Digilogic Systems, a Hyderabad based AS 9100D and ISO 9001–2015 certified company that provides systems, solutions, and products for the defence, aerospace, automotive, and manufacturing market segments, has entered into a strategic partnership with ERAP Korea. Under the agreement, both companies will mutually explore and expand their business/operations in national and international markets, especially in South Korea, the USA, and Europe, among others. The partnership will enable ERAP Korea to strategically strengthen its footprint in the Indian defence and aerospace markets by teaming up with Digilogic Systems. Madhusudan Varma, Managing Director, Digilogic Systems, said, "By joining forces with ERAP, we at Digilogics aim to further strengthen our technical expertise and capabilities towards providing state-of-the-art ground support equipment to Indian R&D and production organisations. Along with ensuring a sustainable future for the Indian R&D and production organisations and the wider defence and aerospace sectors, this collaboration will also enable us to contribute to nation-building through the Make in India initiative."

Flex expands operations with new Global Business Services (GBS) centre

Flex, has lately announced the opening of its new Global Business Services (GBS) centre in Coimbatore. This will be the company's third GBS centre in India and will complement its existing GBS facilities in Chennai and Pune. The GBS centres provide centralised services in support of Flex's global operations in the areas of Global Procurement and Supply Chain, Finance, Engineering and Quality, Program Management, IT and HR, together with other specialised verticals. Commenting on the launch of the new facility, Balroop Grewal, Senior Vice President Operations, Flex, said, "Our vision is to enable global business transformation through integrated and innovative solutions, and GBS is a key enabler of Flex's success. This new GBS facility at Coimbatore will work cohesively with GBS Chennai and Pune to further advance the value GBS can provide to Flex. Our GBS teams will provide continued focus on enhancing and optimising our end-to-end processes, providing actionable insights to our more than 100 sites across the globe, including business leaders."

Godrej & Boyce to develop a 'Make-in-India' value chain for Indian Railways

Godrej & Boyce, announced that its business Godrej Tooling has signed a Memorandum of Understanding (MoU) with Renmakch, to collaborate on Machinery & Plant (M&P) projects for railways and metro rail, offering world-class equipment that is 'Made in India'. With this alliance, Godrej & Boyce will now be able to offer a complete value chain ranging from designs to build for the railways and also bid on larger projects. The collaboration will introduce the latest technology for the rail industry from Europe and other developed countries and indigenize it for India. Speaking on the occasion, Pankaj Abhyankar, Senior Vice President and Business Head, Godrej Tooling, said, "With India's commitment to introduce new generation trains such as Vande Bharat, our partnership aims to promote the indigenisation of products and offer turnkey solutions for major M&P investments in modern technologies. This collaboration will contribute to improving the speed, quality, and safety of railway and metro coaches during maintenance. We look forward to a long and fruitful association with Renmakch on many important public projects for the Indian Railways and Metro Rail."

BPCL launches fast-charging of e-vehicles on six national highways

Bharat Petroleum Corporation Limited (BPCL), announced the launch of EV fast-charging stations on six highways in western India. These six highways are, Pune to Ahmednagar-Aurangabad, 240 km; Pune to Solapur (4 ROs), 250 km; Pune to Nashik (4 ROs), 200 km; Pune to Kolhapur (3 ROs), 225 km; Mumbai to Nashik (3 ROs) 200 km, and Nashik to Shirdi (3 ROs), 90 km. The EV fast chargers will be placed at BPCL fuel stations, which will help customers recharge their EVs in just about 30 minutes via a pay-per-use online service to get a driving range of up to 125 kilometres. Speaking at the launch, P.S. Ravi, Executive Director I/c (Retail), BPCL, said, "We are steadily moving towards converting 7000 of our conventional Retail Outlets into Energy Stations which is part of a comprehensive decarbonisation strategy to support and prioritise sustainable initiatives. We are setting up fast-charging highway corridors to eliminate the range, discovery, and time anxiety of EV customers traveling on highways. 400 such corridors by next year will cover almost every part of the country."

Roadshow for EMO Hannover 2023 concludes in Pune

VDMA, in association with VDW recently organised, the Curtain Raiser/Roadshow for EMO Hannover 2023, the world's leading trade fair for production technology, which took place at Hotel Taj Blue Diamond, Pune on February 27, 2023. Rajesh Nath, Managing Director, VDMA India, Dr Wilfried Schafer, Managing Director, VDW and Dr Jochen Koeckler, Chairman of the Managing Board, Hannover Messe AG were present on the occasion.

EMO Hannover 2023 will cover the whole spectrum of manufacturing technology. It is the international platform for the industry, which brings together experts, decision-makers, and suppliers from all over the world. The joint stands on Cobot Solutions, Additive Manufacturing, the Future of Connectivity, and the Future of Sustainability in Production will be the highlights of the world's leading trade fair for production technology. Speaking on the occasion, Dr Wilfried Schafer, Managing Director, said, "I think it is most important to inform the customers and even companies that are possible exhibitors about the possibilities of EMO, and as we want to guarantee that EMO is a leading trade show in our sector, it is important that we have an international community present in Hannover on the exhibitor side, which is already the case. More than 70% of international exhibitors have already signed up. It is also important that, from the visitors' side, the exhibitors can meet international customers, similar to 2019, where we received 50% of international visitors at the show."

"Events like these give an orientation of what are the upcoming trends so that the investment of the customer, whatever sector he is coming from, is oriented into the future concerning the whole value chain, not just looking at individual technologies, machines but also having the whole perspective, and this is what EMO Hannover offers, the total overview of production technology," he added. Commenting on the vast presence of German companies in India, Schafer said, "I think that this is a positive aspect. There is a large demand on the customer side in India, but there is also a large possibility of cooperation between Indian and German companies. Therefore, I think that due to the foreseeable development of the Indian market, this will increase in the future."

"Entrepreneurship is not a destination, it's a journey

With a vast 10-year experience in the current role. How has your journey been? What inspired you to pursue a career in the cleaning solution industry?

It's rightly said that "Entrepreneurship is not a destination, it's a journey". Starting your own business is a roller coaster of emotions. You have the freedom to build what you want, where you want, and with whom you want, but it does not come without challenges. Highs are high, lows are low, and it takes dedication and mental strength to persevere and achieve the goals you set for yourself and your business.

You are in control of the decisions you make for the business, but you are not always in control of the outcome. So, this journey has always been full of learning, which happens every day. Along with business, I have seen myself grow as an individual. Coming across real-time learning scenarios is the best practical learning approach.

The cleaning industry is a fast-growing industry, and it holds huge potential. The idea to start manufacturing cleaning chemicals materialised in my mind after I realised that there was a huge dependence on foreign brands. I wanted to come up with the best quality products with a mild nature that should be effective and are very well aligned with sustainable practices. We have been successful in executing our thought process, and every day we are adding value to our clients' facilities.

Nidhi Malhotra,
Director, Business Operations,
Harvey CleanPro Industries

Why is equipment cleaning important in manufacturing plants?

The manufacturing process is intensive and often full of dirt. Much like any other workplace, a manufacturing plant needs to stay clean and organised to run smoothly. However, because of the nature of the work that takes place in these facilities, it is especially important to make sure that all equipment is clean and free of contaminations. Equipment needs to be kept clean and functioning properly to produce products without flaws. Failure to do so can lead to costly mistakes and product defects. That is why equipment cleaning should be a top priority in every manufacturing plant.

Why is proper cleaning of a manufacturing facility so important?

A clean, hygienic manufacturing facility is essential to employee health. If a manufacturing facility is dirty, worker health may suffer. If even a single worker comes to work with a contagious illness, facility surfaces can quickly become breeding grounds for the bacteria that cause colds, flu, norovirus, and many more diseases. A clean manufacturing facility is essential for employee safety as well. Facility floors covered in spilled oil, grease, or other fluids can lead to slips and falls, and employees could be seriously injured.

Automated machines/robots in manufacturing units can be programmed to clean and disinfect themselves and the surrounding environment. What are your views on the increased use of automation when it comes to factory cleanliness?

Automated cleaning equipment, such as vacuums and floor scrubbers, offloads some of the most monotonous cleaning tasks. These are tasks that contribute to muscle strains and tears, which are among the leading causes of workplace injury. By automating these tasks, employees can take on new work each day. Employers can also position these investments as part of their commitment to employee health and safety.

What steps do you take to ensure that your cleaning solutions comply with environmental regulations and are safe for use at a manufacturing unit?

Our road to responsible chemistry started in 2013 with the market launch of housekeeping cleaning chemicals in mid-2015. Since then, and over the last 10 years, we have defined 'Responsible Chemistry' and ushered it into our industry, using our expertise to improve the performance of existing materials and develop new ones that are even more sustainable. All our products are certified by third-party laboratories.

'Harvey CleanPro' has been enduring commitment to sustainable business practises motivates it to find ways to help its customers make their own businesses more sustainable and profitable. Our range of products and solutions improves our customers' operational efficiency as well as their cleaning, sanitizing, and hygiene results, which we believe assists them in protecting their brands. Our products also help customers achieve their goals of reducing waste, energy, & water consumption, and we are able to provide documented analysis of the cost and resource savings they can achieve by implementing our solutions.

The biggest concern related to industrial cleaning is improving and maintaining indoor air quality. How is the company working towards the same?

Indoor air is a lot worse than outdoor air. Many health symptoms experienced by workers are caused by indoor air pollution, which is precisely why it's essential to keep the air inside commercial buildings clean and safe. This not only promotes comfort among your employees but also protects their health. Eco-friendly nature of our products improves indoor air quality by not releasing harsh chemical compounds into the air.

How crucial is Big Data when it comes to factory/ manufacturing unit cleanliness, given the fact that costs can be lowered by looking at data from the asset management system?

The data can be used to create workflow plans for cleaning staff. By knowing exact run times and machine users, managers can identify other areas in a space that need the specialised attention of cleaning staff or more productive cleaning patterns. The route tracking capabilities allow management to work together with cleaning staff to develop efficient plans. By working with the cleaning team, monitoring the run times, and analysing the space, more efficient and productive workflows can be implemented.

What do you see as the future of the cleaning industry, and how is your company positioned to take advantage of new opportunities and challenges?

In recent years, due to the COVID-19 pandemic, many cleaning-related businesses were impacted. This, in fact, strangled the cleaning service industry in the short term. However, the economy is predicted to grow in the next few years, opening up new opportunities for commercial and industrial cleaning companies.

We at 'Harvey CleanPro' are committed to bringing ethically produced highest-quality products. These values lie at the core of our company, and we are committed to continuing to produce them. Over the last many years, we have seen great acceptance of our products due to their excellent quality and user-friendly nature. Well-defined sales and marketing processes will help us grab good opportunities. Our sales and marketing processes focus on such prospects who have high standards for the cleanliness of their facilities and who can appreciate the value addition that we can bring to the table. □

"Believe in yourself and your Abilities

How have you navigated challenges in your role as a female leader in a male-dominated industry?

By and large, the logistics industry is still considered a male-dominated industry. The relentless focus on gender diversity in the last two decades has, however, greatly contributed to the paradigm shift as we started recognising the talent that women have to offer in this very field by witnessing the increase in women professionals in this sector.

Women formed only 8% of the logistics workforce, globally, back in 2010. This number has increased massively in a span of eight years, increasing to 20%, globally, by 2018, with India seeing approximately 15% of its logistics workforce formed by women. Talking about gender diversity, CJ Darcl is committed to promoting gender equality at work and has been aggressive in diversity hiring programmes. The organisation now has almost five times more female employees than it did two years ago.

To promote gender diversity and empower women in the logistics sector, we offer training and career development programmes. These include Code of Conduct training for both genders to ensure respectful behavior towards female employees. Our awareness program, POSH, guarantees women's rights against any form of mental or physical harassment or molestation in the workplace. The company conducts periodically various sessions on its breast cancer awareness programme to prioritise the health and wellness of female employees. Also, the women's help desk provides a special forum where employees can voice their concerns anonymously to higher authorities. Additionally, the company offers self-defence classes, location-based WhatsApp groups, and a medical room for women to rest.

How do you see the future of women evolving in the logistics industry in India?

The low capacity of women is observed in the Indian logistics industry due to the perception of the logistics industry

Mahima Agarwal,
President HR,
CJ Darcl Logistics

as male-dominated. However, in recent years, there has been a noticeable increase in the number of women entering the industry, particularly in areas such as warehousing and last-mile delivery, training and development, human resource management, sales, and marketing.

There are several reasons to be optimistic about the future of women in the logistics industry in India, given that the Indian government has launched various initiatives and programmes, to empower women and promote gender equality. These initiatives can create opportunities for women to enter and excel in traditionally male-dominated sectors like logistics.

Secondly, many logistics companies in India are recognising the importance of diversity and inclusion and are actively working to increase the representation of women in their workforce. Some companies are implementing policies and programmes that support the recruitment, training, and advancement of women, as well as creating a more inclusive work environment.

Moreover, technology is playing a significant role in transforming the logistics industry and making it more accessible to women. With the increasing use of digital platforms and automation, many logistics jobs are becoming less physically demanding and more technology-oriented, which can attract more women to the industry.

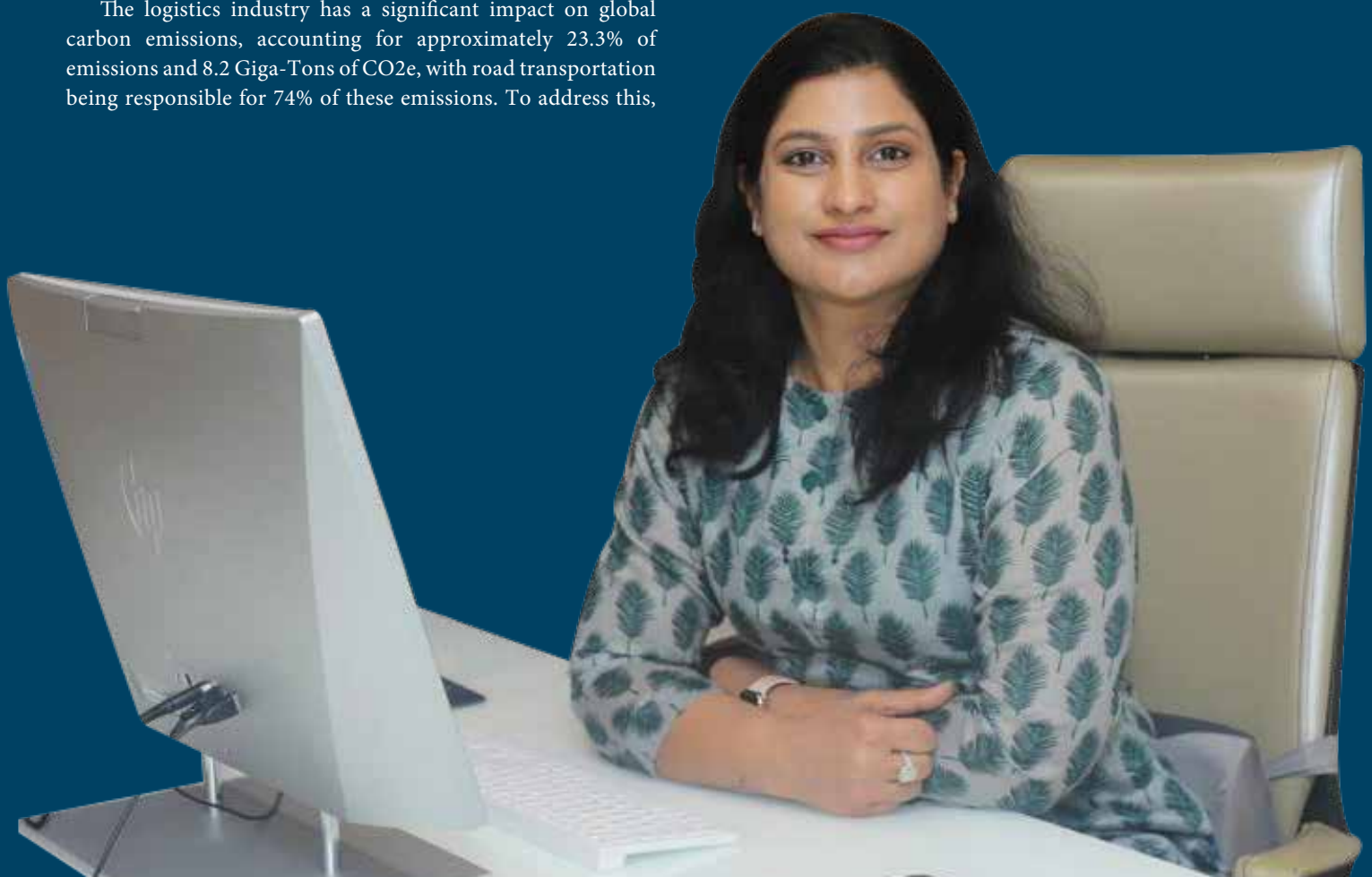
Owing to climate change, sustainability has been an important checklist to tick while defining business goals. What would be your piece of advice to contribute to this momentum?

The logistics industry has a significant impact on global carbon emissions, accounting for approximately 23.3% of emissions and 8.2 Giga-Tons of CO_2e, with road transportation being responsible for 74% of these emissions. To address this, India has set a goal to reduce carbon emissions by 45% and achieve carbon neutrality by 2030, with the logistics sector playing a crucial role in achieving this objective.

CJ Darcl Logistics is taking proactive steps to promote renewable energy and reduce carbon emissions. By adopting, a multimodal approach, to transportation and shifting from road to rail and coastal routes, the company is reducing carbon emissions and increasing efficiency. Additionally, the company is exploring alternative fuel sources such as biofuels, electric vehicles, LNG, and hydrogen-fueled vehicles to further reduce its carbon footprint.

To achieve net zero emissions in logistics by 2050, the industry must embrace innovative solutions such as electrification, alternative fuels, and technological advancements like autonomous vehicles, drones, and hyperloop. Government initiatives such as PM-Gati Shakti, Sagarmala, and Bharatmala projects are also focused on improving multimodal connectivity and infrastructure development, which will contribute to environmental sustainability.

In conclusion, achieving environmental sustainability in the logistics sector requires a multifaceted approach that includes adopting innovative solutions, improving infrastructure, and shifting towards cleaner modes of transportation. By taking these steps, the industry can play a critical role in achieving India's carbon reduction goals and creating a more sustainable future.



Working towards people is as important as working towards business goals. How would you reflect your views on the need to develop people in your organisation to gain competitive excellence?

Our company believes in 'company for people, people for the company' and therefore values its employees above everything else, as is evident from the fact that a significant number of its workforce has been associated with the company for over two decades. The company offers high salaries as compared to market rates and provides them with various other benefits, such as health insurance and job security. The employees are treated as an integral part of the organisation and their individual contributions are acknowledged.

The company is committed to promote gender equality at the workplace and has implemented various initiatives to upskill and reskill its employees, with a focus on diversity hiring programmes. As a result of these efforts, the company now has five times more female employees than it did two years ago, and it is also exploring opportunities to provide employment to differently-abled individuals.

The company regularly conducts mental health awareness sessions and has recently partnered with several organisations to promote employee wellness. To enhance the skills of its workforce, the company organises training and development workshops, and it maintains regular communication with CJ Logistics in Korea to adopt modern technologies and develop strategies for organisational growth. This also provides global exposure opportunities for its employees.

In recent years, we have seen that the logistics and warehouse sectors have become integral parts of the supply chain systems. Your thoughts on this?

We completely agree that the logistics and warehouse sector has become an integral part of supply chain systems in recent years. This sector plays a crucial role in ensuring that goods and products are transported, stored, and delivered to their intended destination in a timely and efficient manner.

Logistics and warehousing are critical components of the supply chain because they help to ensure that businesses can operate smoothly, meet customer demand, and remain competitive in their respective markets. Effective logistics management and warehousing operations can help businesses optimise their inventory levels, reduce transportation costs, and improve their overall supply chain performance.

Moreover, with the increasing demand for e-commerce and online shopping, the importance of logistics and warehousing has only grown. Customers expect faster and more reliable delivery times, which has placed pressure on logistics companies to improve their operations and meet expectations. In conclusion, the logistics and warehouse sectors are essential components of the supply chain system, and their role will continue to be critical as businesses strive to meet the growing demand for faster and more efficient delivery of goods and products. We have also expanded our warehousing operations at specific locations to enhance efficiency and optimise cost.

Can you share any innovative solutions or projects your company has implemented to improve efficiency and sustainability in the supply chain?

To promote environmental sustainability, the company is adopting a multimodal transportation approach using electric vehicles for short-haul distances and proposing the use of LNG for long-haul distances. The company is also shifting its operations from road to rail, from road to coastal, and exploring innovative transportation routes.

Additionally, it is integrating technologies into its systems as part of its environmental sustainability efforts. CJ Darcl Logistics has introduced new verticals such as Project Cargo, Contract Logistics, Warehousing & Distribution, Air Cargo, and Surface Express and centralised its fleet to create cost-effective solutions. The company is particularly focused on digitalisation and technology integration as part of its transformation strategy. While the FTL division remains a significant revenue generator. We have adopted an asset-rights model that reduces liability and works more on a lean logistics model to reduce the cost of operations.

If you had three pieces of advice to give to women who would like to reach decision-making positions in this industry, what would those be?

In a male-dominated industry, it is especially critical to build a strong network for career growth. As a woman, I would advise attending industry events, creating networks with people, mentors, and seeking out opportunities to build meaningful relationships. This will help us stay informed and ahead of industry trends and expose you to new opportunities. The second piece of advice is to believe in yourself and your abilities. Do not be afraid to take risks and take up responsible roles with complete leadership. Women tend to underestimate their skills and abilities, which can hold them back from advancing in their careers.

And lastly, take inspiration from other female leaders who have achieved success in the industry and who can offer valuable insights and feedback on your career trajectory. ☐

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“Focus and keep your passion to be part of the manufacturing world

Neelam Pandey Pathak,
Director Sustaining Engineering,
Philips Healthcare Innovation Center

What are some of your primary responsibilities and challenges in your current role?

In my current role, I am accountable for delivering all the Life Cycle Management (LCM) activities for various business units across the globe for Philips as a part of the sustaining engineering function. As part of the LCM team, we are responsible for delivering on supplier de-risking projects to maintain supply continuity in the future. To work on the various factory sustaining projects to keep the factory up and running so that production impact can be avoided while doing this, and to keep a focus on how to reduce the cost to help reduce overall cost and support the organisation in improving the productivity targets. Some of the key challenges that we face are to de-risk the supply chain, especially when you have multiple suppliers across the globe, and many a times due to legacy products or components, the suppliers are niche and monopolised, in such cases the team needs to do a lot of re-engineering to come to a solution for future de-risking.

What are some of the best practises for optimising manufacturing processes so that they increase efficiency and at the same time reduce costs?

Optimising manufacturing processes can be challenging, but several best practises can help increase efficiency and reduce costs, some of the best practises are:

Continuous Improvement: Focus on continuous improvement by regularly analysing the manufacturing processes and identifying areas where improvements can be made. This can be done through Lean Manufacturing practices, Six Sigma methodologies, or other process improvement frameworks.

Data-Driven Decision Making: Use data to make a decision about process optimisation, data on key performance indicators such as cycle time, scrap rates, and downtime, and use that data to identify areas for improvement.

Use of automation, IOT, and AI: Automate repetitive tasks utilise IOT and AI for giving insights to help improve production efficiency.

Standardisation: Standardise processes to reduce variability and improve quality.

Inventory Management: Optimise inventory management practises by implementing Just-In-Time (JIT) manufacturing to minimise waste and reduce costs.

Energy Efficiency: Focus on energy efficiency by optimising lighting, HVAC systems, and equipment usage; using renewable sources of energy; and managing waste.

Supplier Management: Implement supplier management programmes to evaluate supplier performance and identify opportunities for improvement. Involve suppliers as partners in improving, and work with them to improve their processes too!

How do you stay up to date with the latest industry trends and developments, and what advice would you give to others who want to stay current in their field?

I have a strong network of peers, colleagues, and industry experts, and I leverage my networks to stay up-to-date on the latest trends upcoming in the industry. It is also important to upskill yourself on a time-to-time basis, for example, today is the perfect time to learn more about digital transformation, design thinking, data science, and AI-based technology. To do so, one needs to read about it or enroll in programmes that provide information and knowledge on these topics.

My advice to others who want to stay up-to date in their field is to be proactive and seek opportunities to learn and grow. This can include attending conferences, networking with others in your field, and engaging in ongoing education.

How is IoT technology changing the landscape of manufacturing industries? What are the new opportunities it is bringing to companies today?

IoT technology is having a significant impact on the manufacturing industry, revolutionising the way businesses operate and manage their production processes. Here are some new opportunities through which IoT technology is changing the landscape of manufacturing industries:

1. **Predictive Maintenance:** IoT technology is enabling manufacturers to collect real-time data, by providing insights into machine performance and potential malfunctions. By leveraging this data, manufacturers can optimise maintenance schedules, identify potential equipment failures, and prevent unexpected downtime.
2. **Improved Efficiency:** By using IoT technology, manufacturers can optimise production processes, reduce waste, and improve overall efficiency. For instance, IoT-enabled sensors can monitor equipment performance, detect bottlenecks in the production process, and suggest ways to optimise workflows.
3. **Quality Control:** IoT technology can help manufacturers improve product quality by providing real-time data on the production process. By monitoring factors such as temperature, humidity, and pressure, manufacturers can ensure that products are produced consistently and with required standards.
4. **Supply Chain Optimisation:** IoT technology is enabling manufacturers to optimise their supply chains, ensuring that products are delivered to customers on time and at the lowest possible cost.
5. **New Business Models:** IoT technology is enabling manufacturers to develop new business models, such as product-as-a-service, where customers pay for the use of a product rather than owning it outright. This model provides manufacturers with a recurring revenue stream and allows them to gather data on basis of how their products are being used, enabling them to make improvements and provide better service to customers.

What is the importance of traceability in Good Manufacturing Practices (GMP)?

Traceability is a critical component of Good Manufacturing Practices, It refers to the ability to track and trace the movement

of raw materials, finished products, and other components throughout the manufacturing process and supply chain. Some of the reasons why traceability is important in GMP are:

- **Compliance:** Traceability is a requirement under GMP regulations and guidelines, the failure to comply can result in serious consequences, such as product recalls, fines, and loss of customer trust.
- **Quality Control:** Traceability is a critical component of quality control in manufacturing. By tracking the movement of raw materials and finished products, manufacturers can identify and isolate any quality issues that arise during the manufacturing process.
- **Risk Management:** Traceability enables manufacturers to quickly identify the source of any quality issues that arise, making it easier to contain and manage any potential risks to consumers and the business.
- **Efficiency:** By maintaining accurate and up-to-date traceability records, manufacturers can improve the efficiency of their manufacturing processes. This can help reduce waste, improve inventory management, and increase overall productivity.
- **Customer Confidence:** Maintaining proper traceability records can help build customer confidence in a brand. Customers want to know that the products they are buying are safe, of high quality, and have been manufactured in compliance with all applicable regulations.

Can you share an example of a particularly challenging project or problem that you and your team have faced, and how you approached and resolved it?

This is an example of an earlier time in my career when there was this important project at Propeller shaft line with a critical issue that we were solving, where the one critical operation of welding was increasing the total throughout time of the propeller shaft assembly and we were not able to meet the daily production demand. This made the whole line a bottleneck. Our team took the standardised approach to find out the problem's main reason, studied the whole timeline at each station, and identified all the operations MUDAS in terms of what were non-productive operations. We simulated the whole factory and each station of the line in a virtual model, with the details of each operation, each operator's movement, and the cycle time of each action. We tried and run our model before actual implementation in a virtual model, which gave us more confidence in the output. As part of the Kaizen team, we proposed to de-risk the bottleneck operation of welding and cooling, which was taking more time and hence reducing the overall throughput time.

How do you prioritise and manage your workload, particularly when there are competing demands for your time and attention?

It is important to prioritise your time and workload when you have multiple demands. To channelise my efforts, I follow a few simple steps like :

- I set clear goals for the day and week to achieve with prioritisation.
- Delegation is important as micromanagement does not help, but empower the team to take decisions.
- I balance stuff between my personal and professional lives; it helps me to give dedicated time to both spaces.
- Evaluate, prioritise and be flexible to adapt to changes.

As women are underrepresented in the manufacturing sector, what would be your message to women who want to make it big in the manufacturing sector?

Women are indeed underrepresented in the manufacturing sector, and this is a problem that needs to be addressed. Diversity and inclusion are important for any industry, and the manufacturing sector is no exception. I see this more as an opportunity for women to be part of the industry, and to the manufacturing industry, I would say this: it is important to recognise the value that women bring to the industry and to take steps to increase representation and create a more inclusive and diverse workforce.

This can include initiatives such as targeted recruitment, mentorship programmes, and efforts to create a more supportive and welcoming workplace culture. By working together, we can create a manufacturing industry that is more inclusive, diverse, and successful. I believe we need to make the ecosystem in such a way that when we are hiring people, we need to focus on 'Gender Equity', which will bring gender equality. That means our work environment, our shop floor, and our working spaces need to be gender equal so that anyone can do any operations. To be a part of manufacturing and, most importantly, to sustain it, it is important to have passion for the industry and believe in yourself; keep upskilling, learning, and sharing, as well as helping those who are young in their career. ☐

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YOUR GLOBAL CRAFTSMAN STUDIO

How to exploit your tool grinding niche?

Having specialised offerings makes you an expert, allowing you to invest in the best equipment and take time to innovate and ultimately manufacture a better product in every aspect.

As a small company, you naturally specialise. Perhaps you started as a regrinding shop, but now you're producing tools that can do the job even better. Maybe you began producing a range of endmills or drills, but customers have shown you they want a tool-grinding specialist who can do a brilliant job with one specific product. Because you have a narrower focus than a large-scale operation, you've become an expert, trying new approaches to improve the outcome for your customers. As your knowledge grows, you might be experimenting with tool geometry or manufacturing processes that you've never thought about before. It is time to start thinking about really finding your tool-grinding niche.

What is the benefit of a niche?

You do not have to be good at everything to produce a few great products. Businesses that find a niche can serve a smaller but more enthusiastic customer base. Having a very specialised offering makes you an expert, allowing you to invest in the best equipment, take the time to innovate, and ultimately manufacture a better product in every respect.

Focusing your attention on one key area means honing a high-end product, that customers may be willing to pay more for. In a crowded market, having this differentiated product makes you visible against the competition.

If you're worried that becoming a niche manufacturer sounds risky, know that it's possible to test the waters without risking the farm. Software solutions like ours can give you the flexibility to try new things without taking your focus away from existing contracts and customers.

Guiding you to your niche

How you fit into the market is mostly up to you. You might identify a specialised need for a certain type of tool or particular industry. As you hone that specific manufacturing skill, you might find various applications for it that allow you to expand into complementary or similar components.

Finding those opportunities starts with your customers. Your existing relationships are already based on discussions about product needs and support. Talk to them about their upcoming projects and any challenges they are facing, then work together to find tailored solutions. The value goes both ways your customers can help you understand better what the market wants, while they get something that fits their needs. Don't expect to cover every possible variation or be tempted to go beyond your capacity to produce.

Johanna Boland,
Group Strategy and Communications Manager, ANCA

Offering specialised products

As a small company, you're able to offer a personalised service that bigger businesses can't. You understand your customers' needs. You sell the precise product they need to keep their operation running. They need you as much as you need them.

So being small can be your greatest selling point. You can adapt to the market as it changes and respond to demand. Where potential customers may be frustrated by businesses with long lead times, you can turn things around quickly and with more flexibility. Customers wanting something you don't manufacture yet can even be a plus point. With the tools and flexibility to make it happen, you can easily expand your offerings and show them how well you understand your niche. This kind of specialisation is hugely valuable to a business. You're not only providing labour and materials but also access to years of knowledge and refinement. It's been shown that customers will pay more for specialised products that offer this level of added value.

Keeping up with the demand

The time and labour involved in producing specials meant that, in the past, it was difficult to be competitive. With improved grinding capabilities and more intuitive software, businesses can produce one-offs or two-offs faster. Furthermore, it dramatically increased the efficiency of the manufacturing process, meaning first-time specials could be manufactured at a profit and with shorter lead times. As you settle into your niche of manufacturing a product that others can't provide, demand will start to increase.

Automation can help you keep up:

Reducing changeover time

When you're doing small batch runs, what becomes important is changeover time. You're not setting one process to run for the day, instead you're possibly grinding two, three, or more different tools in a day, each requiring changes in the machine setup. Smart machine designs can help get each batch set up faster, reducing the time it takes to refill materials and reset machinery. Solutions include quick change tooling, wheel pack changers for the automatic loading of wheel packs, and on-machine automatic wheel qualification, which all work to reduce time wasted changing from one tool to another.

Building a bank of IP

As your business evolves, your knowledge of special tool cutting will grow too. With a script for each tool you have successfully designed and grounded, you can automatically build a library of plans and processes. This helps reduce setup times and programming errors from manual input. Having a bank of intellectual property means you can produce anything from your repertoire at the touch of a button, even years later, allowing you to offer even more value to your customers.

Success in the tool-grinding niche of the future means being tech-savvy and open to ideas. Every day you work to service your customers' needs is a chance to continuously improve and adapt. With a niche that's based on real customer engagement, you should be able to deliver superior results that keep your customers coming back for more. □

Maintaining quality easily

When you're producing smaller volumes for a narrower market, you have to know exactly what you're doing. Getting the job done right requires precision and specialised knowledge. You might be concerned that this means you need highly specialised people to oversee output—something larger companies focused on volume orders might not have—but technology becomes a vital part of your highly skilled team without increasing head count. With automated processes in place, your team can try new approaches without disrupting your entire production line:

- Affordable and easy-to-program robots can take out significant costs, enabling lights-out manufacturing and finishing repeatable tasks with ease.
- Lasers or cameras can be used to automate tool measurement and in-process compensation.
- Sensors can check for thermal variations, allowing machines to make in-process compensation adjustments accordingly.
- Flexible software can easily switch between processes, while greater access to data means you can skip out anything that's no longer in demand, so you're always running a tight ship.
- The addition of on-machine wheel balancing capabilities provides for a superior tool surface finish.
- Remote machine monitoring can warn you if issues arise during production. □

Why technology needs more WOMEN LEADERS

For the first time since the Fortune 500 list which began 68 years ago, we saw women accounting for more than 10% of CEOs leading Fortune 500 companies. While this is a certainly heartening news, it's also a clear signal that more needs to be done.

Sangeeta Saxena,
Head – Marketing, Communications & PR – India & APAC,
Hexagon Manufacturing Intelligence

In the technology industry, the percentage of women leaders is even lower than the average. The technology industry is famous for its gender disparity at all levels. Despite several discussions and reports that point to this, women are still under-represented in the sector. As per some reports, over the last 21 years, there has only been a 2% increase in the number of women being hired in the tech sector.

Women make up just 14% of the workforce in software engineering and about 25% in computer science-related jobs. In manufacturing too, according to the World Economic Forum, women account for 33% of junior-level staff, 15% of senior-level staff, and just 9% of CEOs. In India, women make up just 12% of the manufacturing workforce, as per a GE research study on women's employment in the manufacturing, operations, and engineering services sectors.

Role of women in tech and manufacturing

There are several reasons why women are underrepresented in technology and manufacturing. The biggest challenge is overcoming gender stereotypes and perceptions. The lack of adequate role models is another aspect that holds women back.

Manufacturing has traditionally been a male-dominated industry. There is a perception that manufacturing jobs require intense physical labour in a relatively dangerous environment, which is considered unsuitable for women. Across the globe, fewer women take up STEM (Science, Technology, Engineering, and Mathematics) education, although this is not the case in India. However, women often gravitate towards administrative, client support, and marketing jobs, rather than core engineering and scientific career tracks due to some of the reasons mentioned earlier. Other challenges such as persistent gender wage gaps, the 'leaky pipeline' where women often drop out after childbirth, and the perceived glass ceiling also impact the presence of women in these industries, especially at senior leadership levels.

As a result, there are fewer women in leadership roles, which in turn creates a vicious cycle of a lack of role models and unfriendly policies. In general, women need to work harder and display much greater dedication and motivation if they hope to reach leadership positions.

Why having more women leaders is important

There is now enough evidence to suggest that having gender-diverse teams brings better revenue and greater profitability. Even with technological innovations, gender-diverse teams are likely to create better products and solutions compared to those developed under the leadership of a single gender. Besides, both the technology and manufacturing industries foresee major skill gaps in the coming years. This presents an excellent opportunity for women to make their mark. Modern workplaces, both in technology and manufacturing, are quite comfortable and conducive to inclusive policies. Things are starting to change. According to a Deloitte study, the share of women in the overall global tech workforce has increased by 6.9% from 2019 to 2022, while their share in technical roles has grown by 11.7%.

The COVID-19 pandemic actually gave all industries an opportunity to re-evaluate how they view the notion of work as remote work became increasingly mainstream. The challenges will be fewer with time because of digital manufacturing and

automation. The jobs that were done manually in manufacturing earlier are no longer required to be done manually. Most manufacturing industries have adopted automation in material handling and other labor-intensive jobs in a massive way. So the challenge for women to lift heavy things is no longer there. Moreover, while operating the machine, there is a lot of digitalization and minimal physical work, which is why it is now much better for women in manufacturing.

Organisations must do more

Industry leaders must take concrete steps to encourage women to not only join but also stay in the course. Several things can help enable this:

Mentorship and support: Having access to the right mentors in the early stages of their careers can help women make the right choices that are geared towards preparing them for future leadership. This can empower them to look beyond immediate inconveniences, whether it is the lack of role models or unfair treatment, and think for the long term.

Offer a flexible work environment: Rigid workplaces will fail to attract the right talent, whether men or women. The outbreak of the COVID-19 pandemic has established that work can happen even if workers are not physically present at the workplace. Organisations must encourage and enable flexible work schedules, and prioritise output, over attendance.

Mindset shift: The biggest challenge in traditional workplace or industries is often the limited mindset due to existing gender gaps. One way to counter this is to educate and sensitize employees periodically on diversity & inclusion and the only real way to address this issue is to ensure a balanced gender ratio so that there is enough representation to lead with example.

Inclusive policies: Since most traditional industries (e.g. manufacturing) have always been male-dominated, most policies tend to be male-oriented. However, including women at decision-making levels could be the key to ensuring that policies are inclusive and non-discriminatory.

Proactive efforts: Various studies show that women in STEM fields are more likely to quit within the first few years compared to their male counterparts. Several factors are responsible for this, including lack of direction, absence of female role models, unfair work environments, or personal commitments. However, women are less likely to quit if they work in more gender-diverse teams. In addition to camaraderie and comfort, gender-diverse workplaces also demonstrate to women that they have real growth opportunities.

Embracing the change

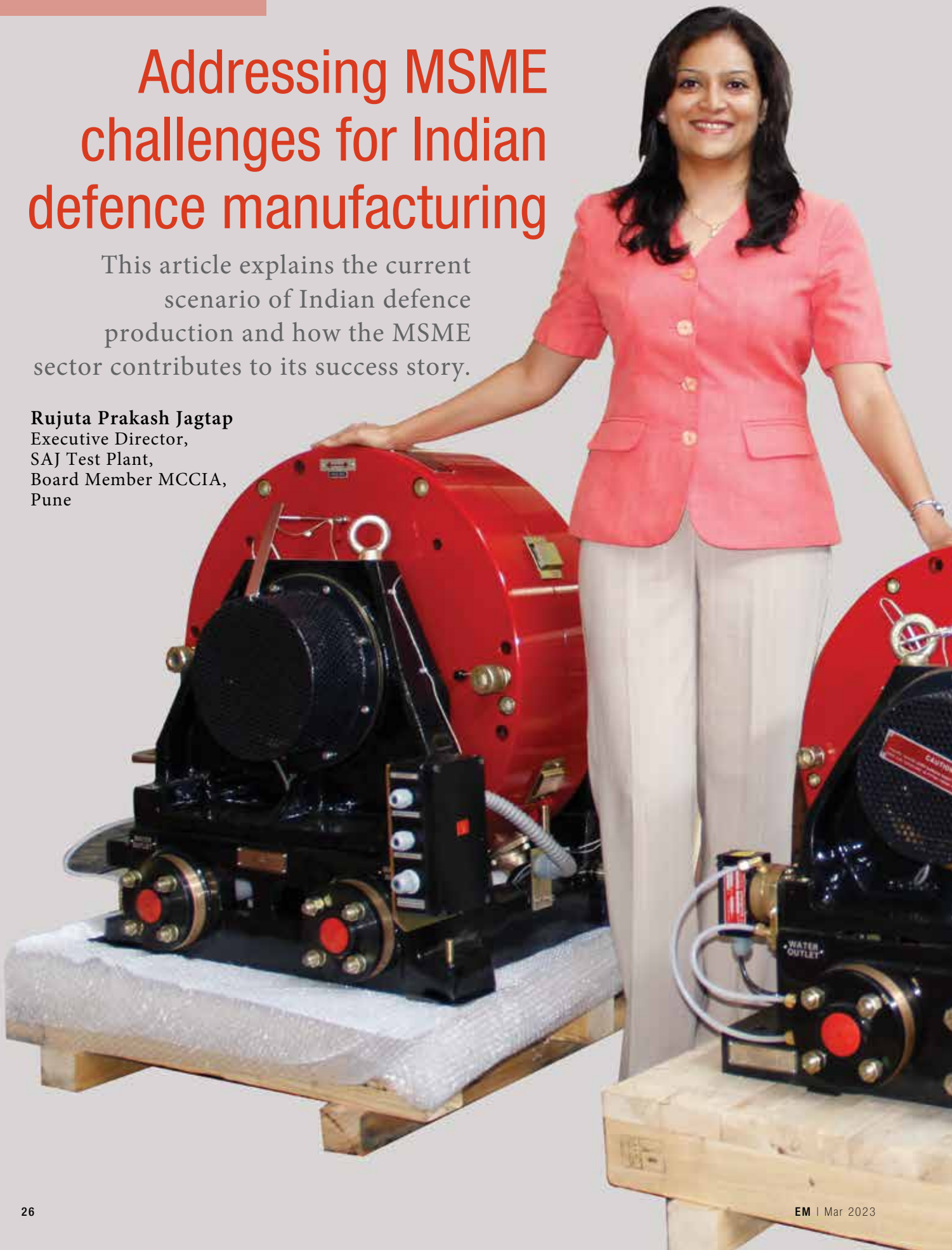
Simply hiring more women is not enough. Organisations must first create the right environment that allows women to perform, thrive, and flourish. Given the immense growth expected in the technology and manufacturing sectors in the next few years, the organisations that make all possible efforts to hire the best employees and leaders based on their talent would have the potential to deliver maximum growth. On a larger societal level too, we need to do more to encourage women to step out of conventional roles only to and choose STEM careers and be ambitious about reaching leadership levels. One way to ensure this is to make proactive efforts at the school and college levels to encourage and educate young girls on the different career possibilities in STEM. This will help drive home the fact that these jobs in the tech sector are not exclusive to one gender.

If organisations truly want to build strong women leaders, the change needs to start right from the bottom of the pyramid. Several organisations have taken proactive steps in setting right the gender gap. However, we still have a long way to go to ensure women get equal opportunities in the technology industry. □

Addressing MSME challenges for Indian defence manufacturing

This article explains the current scenario of Indian defence production and how the MSME sector contributes to its success story.

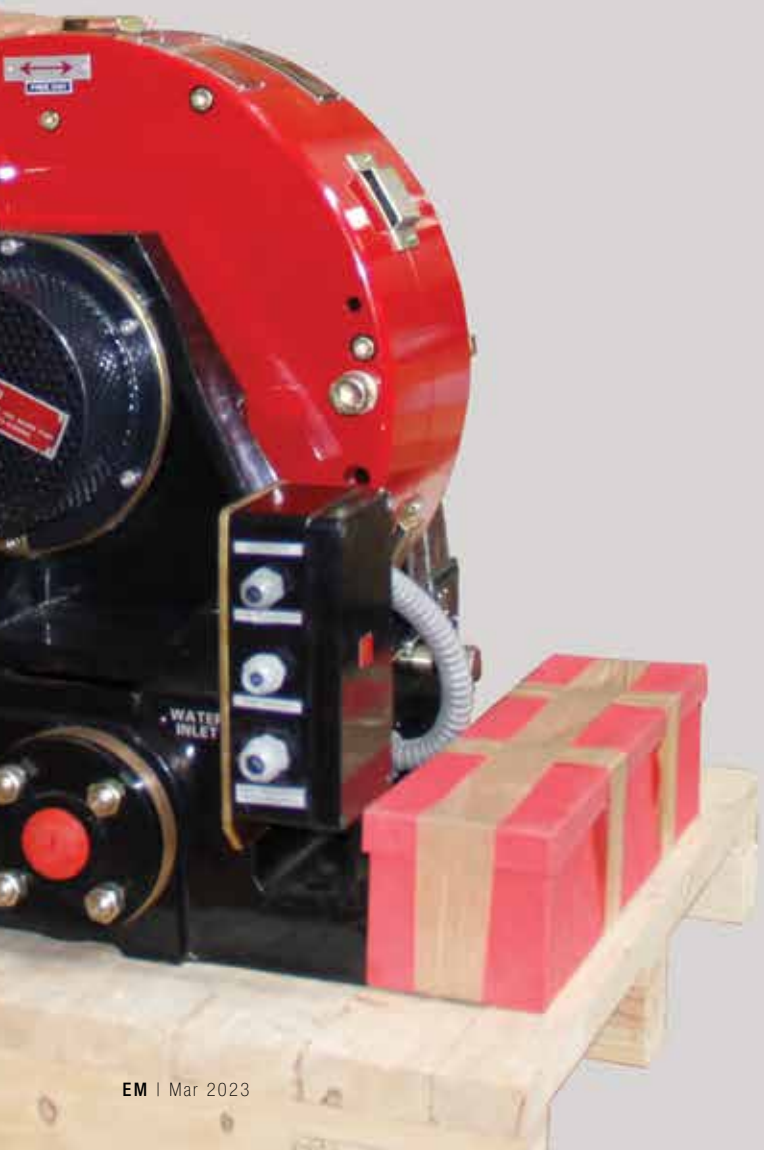
Rujuta Prakash Jagtap
Executive Director,
SAJ Test Plant,
Board Member MCCIA,
Pune



India has been among the top five highest military spenders in recent years and ranked fourth in 2022–23 with a defence budget of ₹5.25 lakh crores, behind the US, China and Saudi Arabia. The defence budget has been raised to ₹5.94 lakh crore for the current year, with a 13.1% increase from the previous year.

India's defence spending, which has been maintained at around 2% of the country's gross domestic product, offers a significant market opportunity for both global and domestic defence manufacturers and the wider defence industry. The government has implemented various policies and introduced several reforms in recent years to promote the indigenous design, development, and production of defence equipments:

- Prioritise domestic procurement and debottleneck procurement process
- Promote private sector participation and incentivise global OEMs to manufacture in India
- Reorganise industry structure to promote competition and indigenous design and development
- Promote export-driven growth
- Reduce import dependencies



Growth in India's defence production

This prioritisation of domestic defence procurement has resulted in significant growth for India's domestic defence production, with the industry's revenue reaching nearly ₹100,000 crores. The Indian government has a goal of increasing annual defence production to ₹1,75,000 crore by 2025. The Defence Acquisition Procedure (DAP) 2020 and subsequent amendments have also significantly shortened the average procurement time to less than two years, down from the previous average of five to six years. India now consistently ranks among the top 25 defence exporting nations, coming in at 23rd place. The country's defence exports have rapidly increased at a CAGR of 54%, from ₹1522 crores in FY16–17 to ₹12,814 crores in FY21–22. Notably, private sector companies accounted for nearly 75% of total defence exports over the last five years. Private sector companies in India reported a total annual turnover of ₹19,920 crores in FY21-22, up from around ₹14,104 crores five years earlier in FY 2016-17, which accounted for about 21% of total defence production in the country.

The number of MSMEs in the supply chain of public sector defence organisations has nearly doubled over the last five years, reaching to over 12,000. Procurement by public sector defence organisations from MSMEs reached ₹5,760 crores in FY 21–22. In 2022, the Ministry of Defence was the top procuring ministry for goods and services from MSMEs, procuring over ₹15,047.98 crore worth of goods and services, with a 250% increase from the previous year.

MSME challenges while supplying to defence

1. Access to capital, particularly for product development and working capital. Getting a bank loan is challenging due to the lack of collateral.
2. Payment to MSMEs to be made in 45 days as per govt norm which is also not being followed
3. Technology adoption roadmap for defence
4. Familiarisation with equipment, availability of engineering specifications, and exact end-user specifications
5. Irregular procurement cycles – Start-ups and MSMEs can also consider partnering with foreign original equipment manufacturers to fulfil indigenisation requirements and offset obligations or collaborate with well-established Indian entities
6. Awareness of tendering procedures

Case study – SAJ Test Plant

SAJ, established on August 31, 1969, possesses core competence in mechatronics used to manufacture Dynamometers, Control systems & Test cycle automation

software, Customised Special Test Rigs and Turnkey Projects from concept to commissioning.

SAJ has more than 6500 installations in the country, with more than 700 supplied overseas, and enjoys the patronage of more than 750 customers. The company's state-of-the-art, fully integrated facility is spread over three acres of land and a 65,000-square-foot built-up area. Since its inception, even before the term 'Make in India,' the company has been focusing on indigenisation/import substitution. It is a Ministry of Defence-approved supplier since 1972, and its products have been supplied to all defence wings including the army, navy, and air force all over India. SAJ has supplied more than 200 test beds to various defence establishments across India, and imparts thorough practical and theoretical training to our defence users on-site as well as at the company's premises to make them self-reliant. SAJ designs and manufactures large Hydraulic Dynamometers up to 9000 HP and has supplied engine test beds to test Tank Engines, Defence Supercharger testing, Marine Engines, Aero Engine Starter Motors, Turbines, etc.

The company has a remarkable footprint in the aerospace sector with esteemed establishments like:

- Base Repair Depot (BRD) of the Indian Air Force
- HAL - Hindustan Aeronautics Limited
- NAL - National Aerospace Laboratories
- ISRO - The Indian Space Research Organisation
- MRO - Pratt & Whitney Aircraft Engine Testing

Some of the Defence Establishments SAJ has supplied to are:

- Vehicles Research Development Establishment (VRDE)
- Research & Development Establishment (Engrs.)
- Engine Factory Avadi
- CVRDE
- Vehicle Factory Jabalpur
- Naval Dockyards- Mumbai, Cochin, Vizag etc
- All Army Base Workshops
- Three Advance Base Workshop, Udhampur
- Eastern Base Workshop,Tejpur
- Western Base Workshop , Pathankot
- DINT (Naval Base)
- DGNP MUMBAI
- BEML
- Bharat Forge Ltd etc

What is the MCCIA Defence Committee?

The defence committee comprises core group members, including VPs of Bharat Forge Defence, Godrej Aerospace, President of DEMA, Mahindra Defence, and IEC Airtools. To provide a platform for interaction between the armed forces, DRDO, DGQA, ordnance factories, DPSUs, academia, and industry, to synergise their strengths and capabilities under the 'Make In India' initiative, and make India self-reliant in the defence domain.

On-going initiatives of the committee

- Procurement/acquisition assistance programme (an ongoing activity)
- Defence exhibition – MSME's, start-up's and innovators
- Connect with Industry for problem statements – ACC&S, ADB, IAF
- Close interaction with RTN – monthly technology meet, start-ups, and a visit to defence establishments
- Awards to MSME's for outstanding contributions in defence production
- Start ups in defence and funding possibilities
- Seminar and ongoing interactions – offsets, import embargo, joint ventures/tie-ups with technology partners
- Defence supplier directory
- Capability mapping of industries for defence production
- Armed forces- industry-academia joint programmes
- Ongoing vendor development series – with DPSUs and private sector □

Turbine Testing With SAJ 2200 HP Hydraulic Dynamometer

Tapping the promise of MRO Technology in maintenance

Indian industries are undergoing a revolution as a result of advanced MRO Technologies, which boost productivity and efficiency. The article explores some of the latest MRO Technologies and explains how they are changing the way Indian manufacturers approach equipment maintenance.

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Maintenance, Repair, and Operations (MRO) is an essential aspect of the manufacturing industry that ensures the upkeep, repair, and replacement of equipment and machinery used in production processes. The effective management of MRO activities can significantly impact a company's bottom line by improving equipment uptime, reducing maintenance costs, and extending the lifespan of assets. In recent years, advancements in technology have revolutionised MRO practises, enabling organisations to achieve greater efficiency, productivity, and cost savings. India's manufacturing sector is one of the largest in the world, contributing significantly to the country's economic growth. In recent years, the industry has seen tremendous change because of the growing usage of digital technology to improve productivity, quality, and safety. MRO technologies are, therefore, becoming more and more crucial for Indian enterprises to achieve operational uplift.

Growth of manufacturing processes

New technologies are likely to develop as the manufacturing sector continues to develop, significantly altering how maintenance is carried out and improving the effectiveness and productivity of Indian manufacturing firms. In order to manage efficient manufacturing processes, the Indian manufacturing sector depends on MRO solutions to ensure that equipment and machinery are operating optimally, resulting in less downtime, reducing manufacturing costs for the company, and overall improving productivity. The advanced MRO technology solutions work towards helping businesses efficiently achieve their goals.

Some of the most widely preferred MRO technology solutions by Indian manufacturers are:

1. Predictive Maintenance

Predictive Maintenance is one of the most significant advancements in MRO technology. Using data analytics to forecast when an equipment is likely to fail allows businesses to undertake maintenance before a breakdown happens. Reactive maintenance, in contrast, only replaces or repairs equipment after it has already broken down. Machine learning algorithms are used in Predictive Maintenance to analyse data from equipment sensors. These sensors record information on the operation of the machinery in real time, such as the temperature, vibration, and pressure. This data is used by machine learning algorithms to find out trends and anomalies that might point to an upcoming equipment breakdown.

Some Indian manufacturers have been slow to adopt Preventative Maintenance techniques and instead continue to use reactive maintenance techniques. Most Indian manufacturers are beginning to understand the importance of Predictive Maintenance in enhancing operational effectiveness and lowering maintenance costs, yet the price of equipment downtime is still increasing.

2. Asset Management Systems

Asset management systems are software tools that help businesses to efficiently manage their equipment and maintenance tasks. These systems frequently have tools for managing inventory, scheduling maintenance tasks, and tracking asset performance.

Businesses are given a centralised picture of their equipment thanks to asset management systems, which allow them to monitor equipment usage, pinpoint maintenance issues, and plan preventive maintenance procedures. Asset management solutions help decrease equipment downtime and lengthen asset lifecycles by streamlining maintenance procedures.

Large industrial companies in India are increasingly utilising

asset management systems, especially those in the automotive and aerospace industries. Many companies have enormous asset networks and complicated supply chains; thus, asset management solutions are crucial for efficient MRO management.

3. Remote Monitoring

Remote monitoring is the process of tracking equipment performance using sensors and other monitoring tools. No matter where the equipment is placed, organisations can monitor it in real-time using this method.

The remote monitoring enables businesses to spot possible problems before they seriously harm their equipment, lessening the possibility of unplanned downtime.

So, the ability to monitor allows businesses with equipment in dangerous or distant areas to track equipment performance without putting workers at risk.

In India, businesses with extensive asset networks, like those in the electricity and energy sectors, are finding that remote monitoring is an increasingly crucial tool. These companies frequently have assets in outlying areas, which makes it difficult to efficiently monitor equipment performance. They can monitor equipment performance remotely and spot possible problems before they result in prolonged downtime.

4. Augmented Reality

Augmented Reality (AR) is an emerging technology that overlays digital information in the physical world. AR can be used in MRO to give technicians access to real-time data on equipment performance, maintenance processes, and safety regulations. AR can support MRO efforts in several ways. AR can be used, for instance, to give technicians step-by-step maintenance instructions, lowering the possibility of mistakes or safety incidents. Moreover, AR can be used to overlay digital data onto actual equipment, allowing technicians to spot possible problems.

Digital Twin: a way forward

Indian manufacturers use AR to provide technicians with digital information that enhances their ability to perform maintenance and repair tasks accurately and efficiently. This helps the technicians understand the step-by-step instructions on how to perform maintenance or repair tasks. This reduces the possibility of mistakes and helps ensure that the maintenance or repair work is completed swiftly and effectively. While on the topic of discussing the effectiveness of MRO technologies, this was notably seen during the peak COVID-19 period. This period caused many manufacturers to force shut production processes or reduce capacity to comply with government regulations. During this time, the Digital Twin Technology played a critical role in boosting the efficiency of the workforce and managing the workload.

Digital Twin represents a physical asset, offering data and insights on how well machinery is performing in real time. Manufacturing companies can simulate various scenarios and spot possible problems early by building digital twins of their facilities. With this strategy, manufacturers were able to streamline their processes and lessen the pandemic's negative effects on their bottom line. Keeping in mind that the pandemic continues to evolve, MRO technology is going to become even more crucial, for firms trying to maintain operations and guarantee business continuity in the face of future interruptions. □

Unlocking secrets to working with titanium

Do you recall hearing of titanium? Even though the word can sound fictitious, it refers to an extremely durable and light metal that has a wide range of applications. Titanium has developed into a crucial material in many sectors, including aircraft, medicine, and the military, thanks to its durability and variety of alloys. The article explores what makes this metal unique and reflects on the applications it can be utilised for.

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Titanium machining is the process of cutting, shaping, or forming titanium metal into various parts or components used in the manufacturing industry. Titanium is a highly durable and lightweight metal that offers excellent resistance to corrosion, making it a popular choice in industries such as aerospace, medical, and automotive. Machining titanium requires specialised equipment and techniques due to its high strength and low thermal conductivity, which can cause excessive heat buildup during machining. However, with the right tools and expertise, titanium can be machined to produce complex and precise parts that meet the rigorous demands of modern manufacturing. In this era of advanced manufacturing, the demand for high-quality and customised components is only increasing. Machining titanium is a crucial part of meeting this demand as it allows the production of parts that are strong, lightweight, and resistant to wear and tear. Therefore, the importance of titanium machining in the manufacturing industry cannot be overstated.

Innovative approaches to titanium machining

The modern industrial era demands more innovative approaches towards titanium machining to produce high-quality, functional, and visually appealing components. The traditional methods of titanium machining are no longer sufficient to meet the stringent requirements of modern industries. Therefore, manufacturers are embracing new technologies. Here are some of the innovative approaches to titanium machining in the modern industrial era:

Additive Manufacturing: Additive Manufacturing, also known as 3D printing, is revolutionising the manufacturing industry, including titanium machining. 3D printing also reduces material waste and increases efficiency, making it a cost-effective option for producing low-volume and high-value components.

Cryogenic Machining: Cryogenic machining involves usage of liquid nitrogen to cool the material and the cutting tool, reducing heat generation and improving tool life. The process also reduces the risk of thermal damage to the material and improves the surface finish of the machined components.

High-Speed Machining: High-speed machining involves using high cutting speeds and feed rates to reduce cycle time and increase productivity. The process also produces less heat, resulting in lower thermal stress on the material and the tool, with a higher-quality finish.

Hybrid Machining: Hybrid machining combines two or more machining processes, such as milling and grinding, to produce complex and precise components. By combining different machining processes, manufacturers can achieve higher accuracy, reduced cycle time, and better surface finish.

Artificial intelligence and automation: AI and automation are becoming increasingly popular in titanium machining. By using sensors and software, machines can detect and correct errors in real time, reducing the risk of defective parts. Automation also reduces the need for manual labour, increasing efficiency, and productivity.

Producing high-quality components

Titanium machining involves combining science and creativity to produce high-quality components that meet the rigorous demands of modern industries. By leveraging advanced machining techniques and cutting-edge technology, manufacturers can create intricate and complex parts that are both functional and aesthetically pleasing.

The science of titanium machining involves understanding the material's unique properties and how they impact the machining process. For instance, titanium's low thermal conductivity can result in excessive heat build-up, which can lead to thermal damage to both material and the tool. Therefore, manufacturers need to optimise the cutting parameters, cooling, and lubrication to minimise heat generation and prevent damage to the material and the tool.

On the other hand, creativity plays a crucial role in titanium machining by enabling manufacturers to produce components that are not only functional but also visually appealing. By leveraging design software, 3D modelling, and simulation tools, manufacturers can create intricate shapes, patterns, and textures that were previously impossible to produce.

Advancement of science

Furthermore, titanium machining has created new opportunities for innovation and product creation thanks to the fusion of science and imagination. For instance, producers in the aircraft sector are adopting titanium machining to produce lighter and stronger parts, such as fan blades, landing gear, and structural elements, that enhance fuel efficiency and lower emissions.

Versatility in various industries

Titanium machining has proven to be a versatile process, finding application in various industries due to its unique properties. The material's high strength-to-weight ratio, corrosion resistance, biocompatibility, thermal resistance, and durability make it an excellent choice for several applications, from aerospace to biomedical, automotive, and beyond.

In the aerospace industry, titanium is extensively used to produce lightweight, high-strength components that can withstand extreme conditions. The use of titanium machining in the aerospace industry has led to the production of aircrafts that are more fuel-efficient, lighter,

and more durable, resulting in significant cost savings.

Titanium's durability in the biomedical industry also ensures that the implants last longer, reducing the need for replacements. The material's biocompatibility and corrosion resistance makes it an excellent choice for implants such as dental implants, hip and knee replacements, and spinal implants.

In the automotive industry, titanium machining is used to produce high-performance components that enhance the vehicle's speed, fuel efficiency, and durability. These components include valves, connecting rods, drive shafts, and other critical parts of the engine.

Moreover, titanium machining has found application in the chemical and oil and gas industries, where its corrosion resistance makes it suitable for use in harsh environments. It is used to produce heat exchangers, pumps, valves, and other equipment that are exposed to corrosive substances.

Reshaping the manufacturing landscape

Titanium machining is transforming the manufacturing landscape by offering numerous benefits that enhance the performance and durability of components. Its unique properties, include a high strength-to-weight ratio, corrosion resistance, thermal resistance, and biocompatibility, makes it a highly sought-after material in various industries, such as aerospace, biomedical, and automotive.

Manufacturers can now process titanium more effectively and efficiently thanks to the development of new machining processes, which lower production costs and improve precision. Titanium machining has advanced dramatically, from CNC machining to high-speed milling and waterjet cutting, enabling producers to create extremely delicate and complex products with little distortion or deformation.

Moreover, titanium machining has created new possibilities for design and creativity, enabling producers to develop new goods with enhanced functionality.

In the medical field, titanium machining is used to produce customised implants and prosthetics that are biocompatible, corrosion-resistant, and durable, providing patients with long-term solutions to medical problems.

Overall, titanium machining is transforming the manufacturing landscape by enabling companies to create high-performance and high-quality components that satisfy the needs of contemporary industries. With the continued advancement of titanium machining techniques, we can expect to see more innovation and transformation in the manufacturing sector in the years to come. □

Transforming manufacturing with drones

Niharika Kolte Alekar
Founder & CEO
Volar Alta

The article explains how drones can help the manufacturing landscape perform in a better way

One of the newest 'wonder- kids' or a cynosure, in the domain of emerging technologies is 'drones'. Let us get one thing out of the way, these amazing machines can not only fly but also walk and swim. Thanks to their wide-ranging potential, they are rapidly evolving into flying machines that provide not just a different view of the landscape in front of us but also a different approach to the problems it poses.

Although drones have literally democratised 'access to the sky', there are a variety of domains in which they can cause positive disruption. Manufacturing is one such domain. Known as an indicator of a nation's growth trajectory, the arrival of Industry 4.0 and the IIoT has already initiated its overhaul.

Becoming efficient and productive

The manufacturing industry has always been at the forefront of reinventing its methods in pursuit of efficiency and productivity, and the next major 'reinvention' can be anticipated if one looks at the current

major challenges such as net zero, supply chain disruption, safety, increasing labour costs, a shortage of talent, and higher costs of adoption of technologies. Let us look at how drones can be of help. Drones can step up to the challenge and address some of these issues to make life easier for management. When it comes to setting up realistic 'Net zero' objectives, one can employ the first two elements of the famous 5S methodology, 'Seiri' and 'Seiton'. They refer to cleaning and uncluttering the workspace, which essentially means being more aware of the scope of the problem and gaining more insights into its spread.

Lack of sensitisation on one's emission footprint is critical to why there is so much discussion about emission reduction but not proportionate action. It is still a topic confined to the upper echelons of industry leaders and remains elusive to the masses when it comes to adopting countermeasures. When prodded further into the causes, it is observed that there are no easy tools available for a small industry to know its direct emission footprint. Drones can, without doubt, be that tool, which, when enabled with appropriate sensors and software, can bring that clarity to the decision-makers, and that is half the problem solved. It will go a long way towards turning it into a movement and achieving India's netzero targets by 2070.

Developing drone solutions

Disruptions in supply chain operations are an issue that need to be dealt with due sensitivity and a better understanding of pain points. Shutting down of factories due to COVID-19 apart, simply the inability to keep logistics operational due to bottlenecks at key ports across the world, left everyone feeling helpless. Additionally, there are aspects of inventory management, movement within facilities, and inspections that are necessary but not value-added. This is a great opportunity for the use of drones to reduce outside dependence on these services and expedite operations with optimised resources. It is also a challenge and an opportunity for drone manufacturers to develop drone solutions for heavy-duty industrial applications that are reliable and easy to adopt. Understanding the precise nature of requirements across industry segments and their standardisation will surely be a worthy proposition. Many initiatives and experiments are being carried out on this front, and we should see the results sooner rather than later.

The safety of the workforce during core operations and service operations such as maintenance and inspection is non-negotiable across all heavy engineering industries involving complex production and machining processes. Unfortunately, until now, brave hearts have had to take those risks and perform tasks that they would rather not, given a choice. Volar Alta is committed to making all these inspection operations 100% safe for human beings using its drone services and helping the management have one less thing to worry about. We are focused on catalysing inspection processes for industrial equipment such as boilers, chimneys, various cooling towers, scrubbing towers in chemical companies, and every other such piece of equipment that needs a human being to enter it for inspection.

Maintenance and safety measures

Although innocuous, these inspections at various stages of maintenance take a lot of time and cause the assets to remain idle. Additionally, the process of inspections involves some serious safety measures, as the conditions aren't always safe to work in.

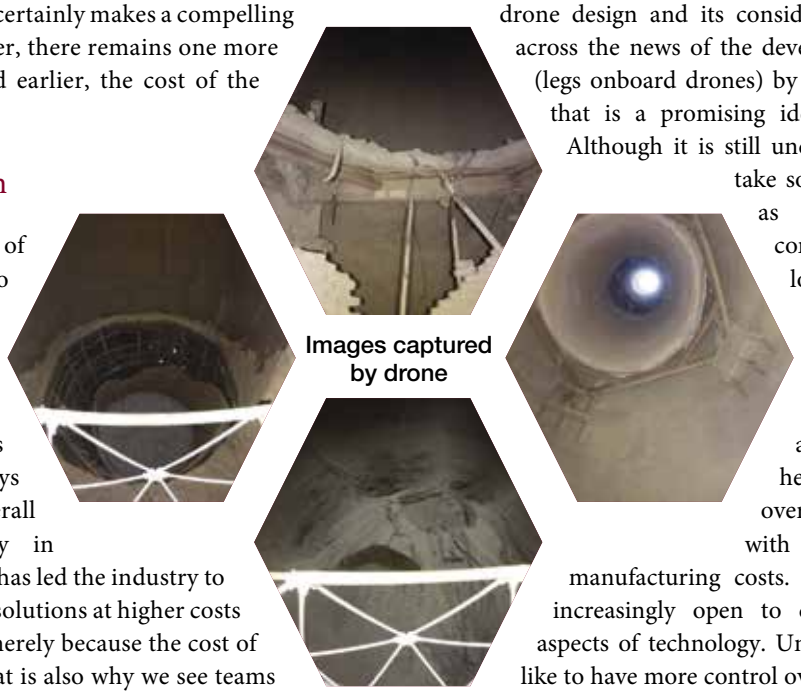
For example, an inspection of chimneys or windmill hubs would be appropriate. With the use of drones equipped with advanced thermal and 3D mapping sensors, we have already earned our clients' trust by ensuring 100% safety, reducing their downtime by at least 90%, and saving inspection costs by at least 85%. Add to it the fact that the quality and reliability of the data

generated are beyond expectations, which has certainly proved insightful for informed decision-making.

We plan to take our service a notch higher and address the challenges that are still not addressed by the current drone offering. We are sure our future solutions will make life easier for customers and service providers. The increased cost of labour due to the shortage of talent remains a challenge globally, be it skilled or semi-skilled labor. I believe that the use of drones to perform certain standard tasks, such as inventory checks and material movements over short distances, can be achieved and automated even by drones with RFID readers and navigation capabilities. They will save considerable time and reduce costs without the risk of human errors. With a plethora of sensors available and a welcome surge in AI development, the utility value of drones certainly makes a compelling case for adoption. However, there remains one more concern that I have listed earlier, the cost of the adoption of technologies.

Technology evolution

With the privilege of hindsight, it is easy to surmise that multiple technology solutions developed for different industry problems were specific to those problems and were not always developed with the overall evolution of technology in mind. Over the years, this has led the industry to adopt various technology solutions at higher costs and continue with them merely because the cost of change is even higher. That is also why we see teams scrambling heads to play buffer in various legacy systems to maintain the continuity of operations.



It is rightly said that you cannot connect the dots looking forward, and that offers a unique opportunity for drone manufacturers to look at all the problems holistically, refine their understanding of customer operations, and develop value with the future in mind across overall operations in industries such as heavy engineering, chemical, power, steel, mining, and cement. Although drones promise to expedite certain processes, such as inspection, there remains significant scope for more. The well-known limitations of current technology, low operating temperatures, one-dimensional hardware, and limited battery life are critical to the large-scale adoption of drones in all the industries listed above. While battery chemistry is being challenged for better performance every day and from every angle, thanks to their heavy use in automobiles, hardware, and the operating temperature range remain less challenged. The focus is on optimisation of existing methods, and the new experimental ways of performance improvement have yet to receive their due encouragement.

Accepting drone technology

There are an increasing number of innovators who are making drone software that is hardware agnostic, and an equal number of innovators who make the hardware application agnostic would go a long way in increasing acceptance of drone technology. We strongly believe that the industry would welcome versatile hardware without compromising on its basic requirement of endurance.

This calls for some serious 'out-of-the-box' thinking about drone design and its considerations. I recently came across the news of the development of LEONARDO (legs onboard drones) by engineers at Caltech, and that is a promising idea for a versatile drone. Although it is still under development and will take some more time to mature as a solution worthy of commercialisation, they are looking at regular drones in a different light, and for that reason alone, more power to them! Such innovative approaches in all processes will also help drone manufacturers overcome their challenges with development and manufacturing costs. One more way is to be increasingly open to collaboration on various aspects of technology. Understandably, they would like to have more control over the value chain of their products. This leads to them trying to be involved in aspects other than their core competencies.

Manufacturing - sustainable and specialised

However, it is opportune to compare the trajectory of the evolution of drones with that of automobiles. Can the approach of specialised manufacturing used in the automotive industry for engines, transmissions, interiors, and sheet metal components be replicated? Someone chose the easier path back then, delaying the inevitable arrival of EVs. Having said that, people are in a much better position in terms of the technology at their disposal to choose the harder path that has sustainability at its core, and therefore, people should push themselves to think things through before they become the norm and save time on their reversal. In the end, that would contribute to the bigger picture of sustainability and prosperity. □

Shilpa Venkat, Marketing Manager, BAXY Mobility

EV industry – creating sustainable vehicles

The article explains and lists the opportunities to reinvent itself through the EV industry.

Get Green and Go Electric is the new mantra adopted by market leaders, unorganised players, and smaller competitors in the market. Like most other industries, the automotive industry is tackling the major role it plays in crafting a more sustainable planet. The concept of earth-friendly is fast becoming the biggest focus and accelerating the largest transformation the automotive industry has ever witnessed. The all-new EV industry is primarily driven by huge customer demand, and a sudden surge of new brands coming into the picture can be seen. The industry is witnessing a unique opportunity to reinvent itself through the EV industry. One can see huge growth in technological advancement when it comes to the EV segment. The concept of sustainable vehicles seems like a realistic choice and a great attraction for most vehicle drivers in comparison to the Internal Combustion Engine (ICE).

India towards becoming an EV nation

To establish a strong e-mobility ecosystem in India, the government of India and numerous state governments have come up with abundant initiatives. All these initiatives are aimed at reaching the determined goal of becoming an all-EV nation by 2030. It is expected that by 2030, the government plans to have an EV sales penetration of 40% for buses, 30% for private cars, 70% for commercial vehicles, and 80% for two- and three-wheelers. The Road Transport and Highways Minister has mentioned NITI AAYOG State EV policies in the EV mission. By 2030, India will require approximately 800 GWh of batteries to be able to attain 30% EV adoption. To accomplish this, the country is fast-tracking plans to manufacture lithium-ion cells, expecting more than 7.5 billion USD in investment potential and $ 2.3 billion in government subsidies. The central government launched the 'Go Electric' Campaign in 2021, with the goal of raising awareness of the benefits of e-mobility and EV Charging Infrastructure. The campaign also aims to create awareness regarding reducing the import dependence of the country.

The government also started the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) programme in 2015, which provided subsidies for purchasing electric vehicles. Phase I of the scheme lasted from 2015 to 2019, while Phase II began in 2019 and delivered upfront incentives for the purchase of EVs and for supporting the deployment of charging infrastructure. Phase II is planned to be completed in 2022. Entrepreneurs should see mobility as a sector with enormous prospects for innovation.

Cost factor

An overlook on EVs and we know that electric vehicles are expensive as compared to our traditional transport options.

This is because of the costly, compact-sized lithium batteries they operate on. The cost of these batteries is almost equal to the fuel prices in India. These high costs are also due to India's lack of lithium-ion battery manufacturing units.

As a result, India is heavily reliant on imports for the raw materials it needs to make these batteries, and lithium and cobalt are the minerals India imports largely from China. Moreover, many EV companies in India function with less than 50% localisation. Hence, they cannot avail themselves of the benefits and subsidies under FAME Phase 2. All these reasons contribute to the increased price of EVs.

Challenges faced

There is a constant hum in the distance about change in the concept of mobility—for the better. No doubt there are a lot of challenges ahead, but it is also worthwhile fighting these persisting challenges. This is most visible in cities, where traffic, emissions, and safety are currently major concerns. The entire mobility ecosystem must work to make the transformation successful, from EV manufacturers and suppliers to financers, dealers, energy providers, and charging station operators—to name only a few. The tipping point in passenger EV acceptance happened in the second half of 2020, when EV sales and penetration fast-tracked in major markets despite the economic crisis caused by the COVID-19 pandemic. Consumer beliefs have also shifted towards sustainable mobility, with more than 45% of vehicle customers considering buying an EV. However, the continued acceleration of electrification is putting significant pressure on OEMs, their supply chains, and the broader EV ecosystem to meet these targets. This is particularly obvious concerning setting up the required charging infrastructure. In response, the mobility industry is unleashing a stunning array of EV inventions and innovations designed for Indian urban and semi-urban roads, such as mobility-as-a-service, advanced traffic management, parking systems, freight-sharing solutions, and new transportation concepts on two or three wheels.

EV three-wheeler cargo industry

A recent article stated research by Investment Information and Credit Rating Agency (ICRA) that stated, EV three-wheelers have a huge potential to create a big

transition in the Indian three-wheeler market as they can carry more weight, travel long distances, and usually give good mileage on a single charge. The year 2022 saw a tremendous increase in the number of new electric vehicles sold in the nation. The EV three-wheeler segment is predicted to see a big rise shortly.

So, what is the major reason for the sudden surge in EV three and four-wheelers in India? The market has considerably grown, mainly because a large part of Indian consumers are dependent on online shopping. The e-commerce business has a dedicated plan to adopt these automobiles into their logistics department and focus on converting more than 20% of their fleet to electric.

A substantial number of people want to delve into internet shopping from the comfort of their homes. This has led to the big rise of Last Mile Delivery, and here is where the three-wheeler industry primarily comes into the picture with their cargo autos specially designed for last-mile delivery. The EV three-wheelers will capture a big share of the market with a huge rise in e-commerce and the great demand for last-mile connectivity and quick delivery of products.


Going green

If you observe, the normal ICE mid-sized trucks or vehicles used for commercial deliveries are priced higher than the three-wheelers. Larger vehicles frequently have difficulty navigating through smaller streets. Here, EV comes to the rescue. They are reasonably priced, require little maintenance, and if electric, are extremely simple to operate. EV vehicles have a good load-bearing capacity & are perfect partners for last-mile connectivity.

The lower cost, no carbon emissions, eco-friendliness, and good mileage are the factors that have a magnetic effect to pull various manufacturers to jump into the EV sector. Increased manufacturing of EVs in India has created a plentiful number of business opportunities in the nation and across the world for automobile establishments. India has presently one of the leading automotive industries worldwide, contributing nearly 8% to 10% of the country's GDP. Now, we are seeing gigantic growth in the EV 3-wheeler industry.

Battery management system

So, what is going to be the EV future? Are we as a country prepared for a full-fledged electric ecosystem? Well, yes, there are hurdles: inadequate infrastructure, the very high cost, at this point most EVs are priced higher than ICE vehicles, fewer EV charging stations, and the scarcity of necessary amenities, which is the major reason for the considerable sluggish growth in electric mobility. There is also the additional challenge of waste management for EV batteries.

The government is also working along those lines. There is no doubt that Lithium-Ion is the most powerful and popular EV battery; however, it has proven to be hazardous to the environment and needs to be recycled or disposed of in an environmentally friendly way. This has paved the way for use of lead-acid batteries, as these are not harmful to the environment, plus they are inexpensive, safe, reliable, and have high power. Lead acid batteries are being used in the manufacturing of most EVs to enhance the other battery loads.

Challenges and hurdles will always exist at the beginning of any major transformation. It is commendable to see that the Government of India is striving hard in terms of offering benefits and subsidies to convert more customers into EV owners. They are also recommending tax exemptions for consumers willing to buy EVs on loans. Yes, on a larger scale, these might be small baby steps indeed! But we need to remember, that implementing anything big will take a considerable amount of time. A mind shift and readiness to accept a change in attitude must happen! The Government of India is taking proactive measures to promote and increase the use of eco-friendly EVs in the country.

Towards an increased adoption of EVs

While the policy framework of the government will go a long way towards promoting EVs in the country, their implementation will also be contingent on varying aspects—the distance covered on a single charge, the cost of the vehicle, and, most critically, the availability of charging infrastructure. Given that India is an emerging EV market with limited capabilities for charging them, their increased adoption will necessitate the establishment of a widespread public charging network in the country.

Alongside setting up the charging infrastructure, there is also a need to elevate the present electricity supply infrastructure to make it EV-ready since the amplified power demand will stress the grid, particularly in areas with a high concentration of EVs. □

EM reports from SWITZERLAND

Setting the right motion with 'Motion Meeting – Expedition 2023'

Under the theme 'Expedition 2023' this year's edition of Motion Meeting showcased recent additions to the company's product portfolio and outlined the success mantra for a robust orderbook. The post-event report reads as below…

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In the quaint and picturesque town of Thun, Switzerland, there was a congregation of more than 60 journalists from around 20 countries who attended the annual press conference at the Studer headquarters in Thun/Steffisburg.

At the beginning of the Motion Meeting event, Jens Bleher, CEO, Studer greeted the press fraternity, marking the conference as a historic moment as Fritz Studer began his business at the same location exactly 111 years ago. Stating the importance of being a pioneer in cylindrical grinding since its inception, which has entrusted countless technological innovations, Bleher stated, that, "We are therefore particularly pleased that Studer succeeded in continuing its growth course in 2022 with significantly increasing sales. Also, we are very positive about the outlook for 2023. After a remarkable final spurt at the end of the year, Studer started 2023 in full momentum, with a large order backlog."

Robust Order Book

"Overall, it was the third-best year in our company's history in terms of order intake," expressed, Sandro Bottazzo, CSO, Studer. Expectations were exceeded by far in all sales regions globally. Some countries, such as Turkey even recorded the highest order intake in company history. "All in all, in 2022, we once again succeeded in expanding our position in the most important markets in the world and increasing our market share," summarised Bottazzo.

In 2022, almost all markets showed growth in orders. New customers were responsible for 37 percent of the orders. Furthermore, December was the second-best individual month in our history. The aerospace and energy segments significantly contributed to this positive development. The tooling, Die and

Mold, and machine manufacturing segments remained stable at a very high level. The Precision Engineering segment, with small and medium-sized supplier companies and contract manufacturers, remains our largest individual segment. On the other hand, in the automotive sector, there was a decline that specifically affected demand for production machines. "However, our good positioning and broad portfolio have helped us greatly," emphasised Bottazzo.

Mantra to Success - Broad portfolio

A broad portfolio that can fulfill a wide variety of customer

requirements is both our trademark and an important pillar for Studer's success. In the 2022 business year, universal and internal cylindrical grinding machines showed a positive trend, in both the standard and system businesses. The bestseller among the Studer machines was once again the versatile S33 CNC universal cylindrical grinding machine, which is capable of producing small and large workpieces in both single and series production. The S31, and the S41 were favorites among others. In the sales of internal cylindrical grinding machines, Studer achieved its

second-best annual result ever. Another area that reached a record high was the WireDress® technology, which enables precise dressing of metal-bonded grinding wheels and thus boosts productivity to extremely high levels.

Customer care with record sales

Bottazzo has more good news from the area of customer care. Here, STUDER achieved a new revenue record in 2022. "All business areas did very well, with service, maintenance, and individual businesses all setting new records. In overhauling, it was the second-best year in our company history," Bottazzo stated. Because of good business development, STUDER has further expanded its service organisation. Customers thus profit from even better availability and faster problem-solving. Additionally, numerous business processes have been digitised and optimised. "We will continue to grow our customer care to provide even better performance and to be closer to our customers," announced Bottazzo.

New Product Development

The 2022 business year also brought numerous new developments and an expanded product range. Daniel Huber, CTO, Studer, explained, "With our product offensive, innovative, and application-specific solutions, we can even better address the needs of our customers,". On one hand, the new generation of the well-proven KC33 CNC universal cylindrical grinding machine was presented to the Chinese market. On the other hand, with the ecoGrinder, Chinese customers now have an economical entry-level solution available—and it has already found numerous buyers. Huber also asserted that "In 2022, we presented an innovation at almost every large trade show,". This includes the S36 production machine at GrindingHub in Stuttgart. It closes a gap in the portfolio between the S11 and S22 and is particularly well-suited to applications and components in the field of electromobility. Now the S36 is also available with an innovative energy monitoring concept. Or there's the new S100 that was presented at the BIMU in Milan, a perfect entry-level option in the field of CNC universal internal cylindrical grinding machines.

More machines with C.O.R.E.

The revolutionary and cross-brand hardware and software architecture of the UNITED GRINDING Group can also be found on an ever-increasing number of machines. C.O.R.E. offers smart networking of several machines, freely configurable and user-friendly operation, and the latest generation of contact sensors. C.O.R.E., also features a modern, large-scale multitouch display with intuitive operation and numerous visualization options for more efficient production. In 2022, Studer was already able to convert four machine types to C.O.R.E. and will continue the rollout on the internal cylindrical grinding machines in the coming year. Supporting this statement, Huber expressed that, "Only manufacturers that offer intelligent machines with intuitive operation,

digital assistance, monitoring systems, automation options, and efficient process management will be successful in the future,".

Challenges in the supply chains

The supply chain situation will remain an important topic in 2022. Jens Bleher, CEO, Studer said, "Despite the tense situation in the procurement markets, our operations team and Engineering jointly succeeded in producing reliably and continued to provide very competitive and reliable delivery times." Stephan Stol, COO, Studer explains, "Our strategy of keeping our production resources at a stable level even during difficult phases was as much part of this success as the long-term partnerships we have enjoyed with our supplier base." Studer also benefited from the risk-based supply chain approach that it has been following for several years to minimise single-source dependencies wherever possible. Another success factor was the close collaboration between engineering and purchasing, which allowed them to evaluate alternative components well in time when bottlenecks seemed imminent.

Investment in the future

Regular and systematic investments in all areas of the company are a part of Studer's company philosophy. Stoll explains "We are convinced that this will keep our locations competitive and that Studer machines 'Made in Switzerland' will have a strong foothold on the world market in the long term,". Following the redesign and modernization of assembly, the focus has been on manufacturing over the past few years. In 2022, several projects contributed to ensuring that the production resources remain state-of-the-art, with a special focus on automation and digitization. In the coming year, spindle shaft production will be renewed and expanded, while the warehouse and logistics infrastructure will be comprehensively modernised by 2025.

Training and attractive career changes

Vocational training and career opportunities can also be improved through investments. "Modern workstations and top-level vocational training ensure that we remain attractive as an employer and can recruit the best talents and top employees, even in times with a shortage of skilled labour," Stoll further stated.

Studer provides in-house vocational training to qualify its skilled workers and offers them attractive career and professional development opportunities. Bleher emphasised the importance of well-trained employees for a technology company, stating that, "Studer kept its vocational training program fully operational at all times." Trainees account for more than 11 percent of the workforce. He further added, that, "We take this into account by investing in the latest generation of CNC machines for the training workshop, as we also did in previous years."

The management was also particularly pleased about the successes at the World Skills competitions. After winning the gold medal at the SwissSkills and the silver medal at the EuroSkills competition, polymechanic Gil Beutler crowned his excellent performance with a bronze medal at the WorldSkills in Canada. Bleher said, "We are very happy about Gil's successes and view his top placements on an international level as a confirmation of the consistently excellent work of our entire vocational training team over many years."

'Fritz Studer Award' for talent and innovation

The "Fritz Studer Award" is another way the company promotes the best talents and innovative ideas. The research award comes with a prize of CHF 10,000 and will be hosted for the seventh time this year. It is aimed at students of the European universities and technical colleges. Submissions are invited from areas such as: innovative machine concepts, digital solutions for supporting the grinding process, or alternative materials. Participants can enter with either their individual work or team projects. ❐

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LMW showcase their latest machines at Machauto 2023

LMW recently displayed some of their latest machines in turning, milling, and turnmill centers at Machauto 2023, which was held at the Ludhiana Exhibition centres, Ludhiana, from February 24 to 27, 2023.

Smart Minimaster – Horizontal Turning Center

The Smart Minimaster, is an ultra-compact turning center with turret and linear tooling op-tions to address the demands of emerging industries towards accuracy and productivity. It comes standard with a 5" chuck, 6000 rpm spindle speed, 3.7/5.5 kW power, & 30 m/min rapid rates. It occupies a meagre 1.77 Sqm floor space. Smart Minimaster is a perfect choice for precision machining requirements in industries such as fittings, connectors, & bearings.

J2 – Vertical Machining Center

The J Series machines have high demand in the market for their reliability, performance, and precision. It provides a wide working area, spindle power ranging from 7.5 to 22 kW, and spindle speed up to 12,000 rpm. The ergonomically designed machine supports easy loading and unloading operations. The tool change takes less than two seconds, saving significant time. The J series machines are highly versatile to cater to major industries like automobiles, Die and Mould, pumps and valves, forging, and general engineering.

LL20MY L5 – Turnmill Center

The LL20MY L5 is a 4-axis turn-mill center with high-precision roller LM guideways. It has a maximum turning diameter upto 300 mm and a spindle speed of up to 4000 rpm. This machine comes with 12 station drive tools. The highly rigid bed structure helps with heavy cutting. This machine is a great choice for agri and earthmoving, aerospace, defence, automobiles, pumps and valves, die and mould, medical, and general engineering.

Honeywell India | Pune

Innovative Earthworks Solutions

Kennametal India Limited (KIL), offers KIL's premium 38/30mm shank series conical tools and concomitant holders for hydraulic rigs and wall cutters, as well as the KF Series quick change flat cutters, weld-on teeth, and flat teeth with TC buttons. These are known for maximising productivity and boosting overall performance. KIL has also developed a 25mm shank conical tool and holder along with a new 'core barrel ring' designed by in-house experts as per customers' customisation requirements. These drilling innovations are the leading-edge cutting solutions for foundation drilling applications that keep high-value equipment running longer and performing better in demanding environments, while continually providing new and innovative solutions. Commenting on these solutions, Rohit Reddy, Deputy General Manager, Earthworks Business, Kennametal India, said, "With India witnessing an uptick in infrastructure development, our customers demand higher productivity and performance from their equipment in order to support the nation's rapid development needs. Kennametal's offerings in road rehabilitation and mining are developed to perform in the toughest conditions and deliver optimum efficiency. We look forward to partnering with customers to transform how everyday life is built."

Foundation Drilling Solutions

Kennametal India | Bangalore

Safety Light barriers

Schmersal has developed a new series of safety light barriers SLB440 light barriers with an IP69 degree of protection, suitable for hygiene-sensitive applications in the packaging and food-processing industries, such as milk and meat processing. With a diameter of 62 mm and a height of 115 mm, the single-beam light barriers in the SLB series are extremely compact. This makes them ideal for thermoforming machinery for food packaging, for use on cutting equipment, or on other machinery with narrow installation spaces. SLB440 light barriers have been designed along the lines of the SLC/SLG440 IP69 safety light curtains and grids, which have been widely used in the food-processing and packaging industries for years. The new single-beam light barriers have been designed to cope with the high levels of stress placed on them by the cleaning processes that are commonplace in these industries. Thanks to a sophisticated, detailed design, the SLB440 series achieves an IP69 degree of protection and is thus protected against the ingress of water during close-range high-pressure and high-temperature spray downs.

SLB440 light barriers

Schmersal India | Pune

Solution to digitalise every transformer

Hitachi Energy, recently launched the next-generation TXpert Hub, a part of its ecosystem for transformers' digitalisation. The TXpert Hub enables monitoring by aggregating, storing, and analysing the information received from the transformer's digital sensors. It is built on the solid foundation of Hitachi Energy's journey of pioneering innovation in this field for more than 30 years and is conceived to simplify digitalization for any transformer with enhanced connectivity and cybersecurity. Bruno Melles, Managing Director, Transformers Business, Hitachi Energy, said, “Electricity will be the backbone of the entire energy system driven by energy transition, making the power grid a complex system of systems. Digitalisation is the only way to manage that complexity to deliver the necessary visibility and agility to enable fast data-driven decisionmaking". The next generation TXpert Hub, powered by the latest CoreTec technology, has been built from the ground up to ease transformer digitalization, focusing on:

TXpert Hub

- Incorporating operative experience from users of earlier versions of system
- The application of the latest technologies in communications and cyber security
- Readiness for off-the-shelf retrofits

Hitachi Energy | Bangalore

New bending machine for XXL parts

TRUMPF is taking its INTECH in-house trade show as an opportunity to showcase the latest generation of its TruBend Series 8000. With an 880-millimeter open height and a stroke of 700 millimeters, the TruBend 8000 bending machine offers a superbly efficient way to bend very large parts, allowing workers to easily bend and remove workpieces that require a large box height. It also provides numerous optional extras designed to facilitate the bending of heavy parts. These include a bending aid that makes operators’ lives easier by automatically positioning the workpiece for bending. This series of machines can also be equipped with a special tool clamp for XXL parts. With a press force of 400 metric tons, the first in this new generation of machines is an efficient powerhouse that has no trouble processing short, thick pieces of sheet metal. But thanks to its generous 4.40-meter bending length, it is equally at home with longer, thinner parts. The machine is also suitable for bending high-tensile materials such as Hardox or Weldox engineering steels. Station bending is another option available with the TruBend 8000.

TruBend Series 8000

Trumpf (India) | Pune

Indexable Milling Platform for Heavy Roughing

WIDIA™, recently announced the release of the M8065HD indexable milling platform for heavy-duty milling operations in steel and cast iron materials. Designed with eight cutting edges and extra wide chip gashes, the M8065HD is capable of achieving deep depths of cuts while producing high metal removal rates during face milling applications. Engineered with a 65-degree approach angle with a 6.35 mm thick insert, the M8065HD has one universal insert geometry in three versatile grades: WP35CM, WK15CM, and WU20PM. The WP35CM grade targets all types of steels, while the WK15CM grade is designed for cast iron materials and performs best in dry applications but can also be used in wet conditions. The universal WU20PM grade can be used for the machining of steel, stainless steel, and high-temperature alloys in both dry and wet applications. Christine Schneider, WIDIA Senior Global Portfolio Manager, said, "The M8065HD represents a turnkey solution for general engineering, energy, and automotive customers who want to reduce their face milling tooling inventory and increase their machining outputs."

The M8065HD indexable milling platform

WIDIA Products Group | Pennsylvania, USA

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I, Dhiraj Bhalerao, hereby declare that all the particulars given above are true to the best of my knowledge and belief.

Dated: March 17, 2023

Highlights – April 2023

» **Microfactories**
Microfactories are compact production facilities that can create a wide variety of goods in a highly flexible way. These factories often employ cutting-edge technology like automation, robots, and 3D Printing to facilitate the speedy and effective manufacture of small batches of customised goods. They can be used to manufacture replacement parts and other components as needed, thereby lowering the requirement for vast inventories and the related storage and logistics expenses. This piece will highlight the advancements among the microfactories.

» **Wearables**
Wearables in the manufacturing sector can enhance training, boost output, promote worker safety, enhance quality control, and simplify inventory management. The manufacturing industry has adapted to the technological advancements by making a variety of technological items to be worn by employees in a production setting. Smart watches, Augmented Reality (AR) headsets, smart glasses, and other wearable tech items can be among these gadgets. The feature will talk about the adaptations made by the industry to improve work efficiency.

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MOLDINO Tool Engineering, Ltd.

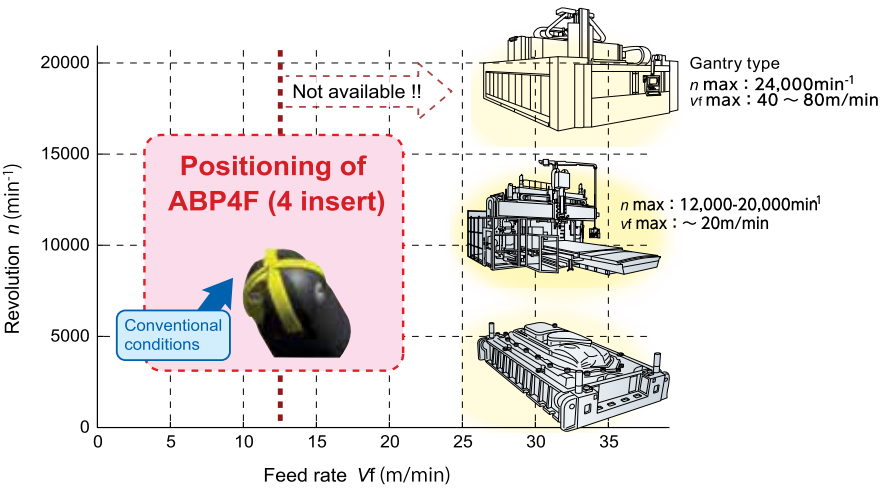
MOLDINO

ABP4F type

Ball Precision Multi Flutes ABP4F

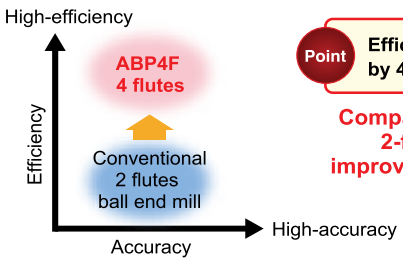
・New product: 4-flute ball end mill (ϕ20 to ϕ30) compatible with machines ranging from general-purpose manufacturing machines to the latest high-speed machines

Example of large press die for automotive parts



Processing advantage of 4-flutes end mill

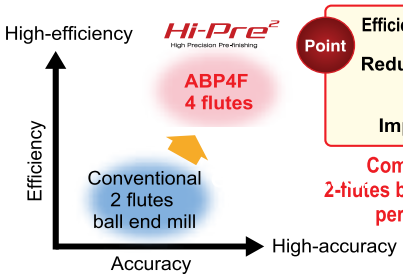
Figure Finishing



Point **Efficiency improves by 4-flutes end mill**

Compared with conventional 2-flutes ball end mill, improves cutting performance.

Figure Semi-Finishing



Point
Efficiency processing with small pitch
↓
Reduce the processing load on semi-finishing
↓
Improve finishing accuracy

Compared with conventional 2-flutes ball end mill, improves cutting performance and accuracy.

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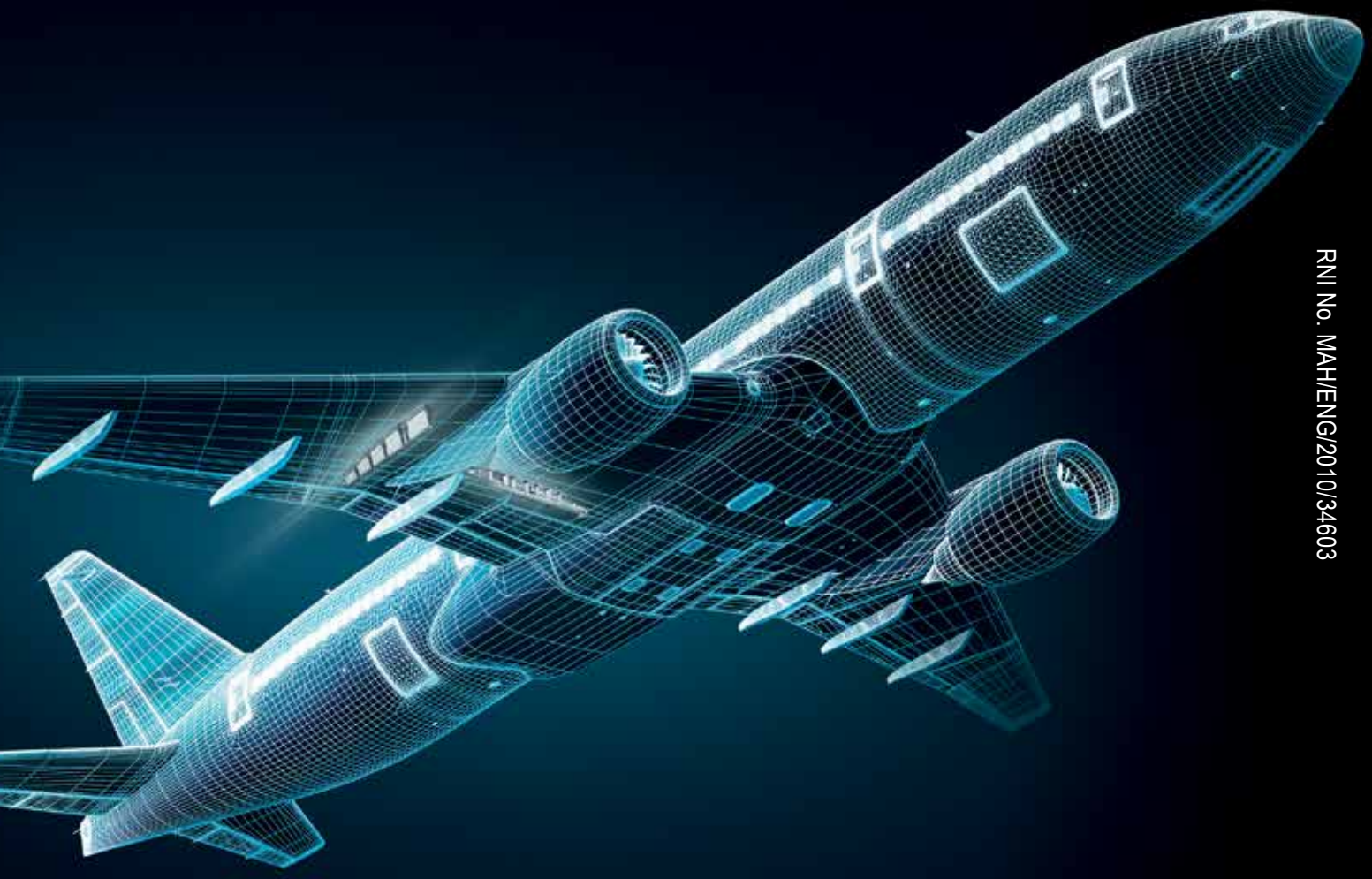
Can we stop lighter planes being a weighty issue.



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The number of passenger aircraft is set to double to more than 40,000 by 2030. Twenty-first-century long-haul aircraft have a take-off weight of up to 500 tonnes. The task of lifting these goliaths into the air economically is about more than keeping the weight of materials and components down – our future needs require stepping up process reliability and quality when machining them too. This is presenting suppliers to the aviation and aerospace industries with a huge challenge. Having a tool partner that keeps costs firmly on the ground is therefore crucial.

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