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Azadi Ka Amrit Mahotsav

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EM - Interview

Takashi Yamazaki,
Chairman, Yamazaki Mazak Corporation (p. 10)

EM - Interview

Bharat Gite,
MD & CEO, Taural INDIA (p. 14)

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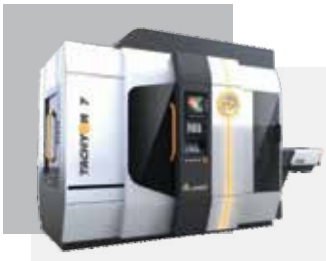

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2 QUALIFY YOURSELF

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- ❑ 01. Corporate / General Management
- ❑ 02. Director, Supervisor
- ❑ 03. Group Leader, Project Leader
- ❑ 04. Manager, Specialist
- ❑ 05. Engineer, Technocrat
- ❑ 06. Other

2. Select a title that describes your principle job function

- ❑ 01. Management
- ❑ 02. IT
- ❑ 03. Safety & Security
- ❑ 04. Risk Management, Accident Management
- ❑ 05. R&D
- ❑ 06. Design Engineering (Plant Engineering)
- ❑ 07. Project Planning, Production Planning
- ❑ 08. Laboratory, Test, Field Service
- ❑ 09. Explosion Protection, Fire Prevention
- ❑ 10. Manufacturing, Production
- ❑ 11. Quality Assurance
- ❑ 12. Reliability, Evaluation, Services
- ❑ 13. Energy & Environment Technology
- ❑ 14. Facility Management
- ❑ 15. Sales, Marketing
- ❑ 16. Purchasing
- ❑ 17. Warehouse, Transportation, Logistics
- ❑ 18. Consulting / Advisory
- ❑ 19. Education
- ❑ 20. Other

3. Select the industry which best descibes your company's primary business activity

- ❑ 01. Industrial Machinery
- ❑ 02. Electrical & Electronics equipment
- ❑ 03. Communication & Information Technology
- ❑ 04. Power & Energy
- ❑ 05. Automotive Manufacturing
- ❑ 06. Steel / Metal
- ❑ 07. Optics & Precision Mechanics
- ❑ 08. Chemical & Pharmaceutical Industry
- ❑ 09. Bio-& Environmental Technology
- ❑ 10. Mining, Oil, Gas
- ❑ 11. Wood, Paper, Printing
- ❑ 12. Food & Beverage
- ❑ 13. Textile, Leather
- ❑ 14. Building Automation
- ❑ 15. Technical Consulting, Engg. & related services
- ❑ 16. Machine Tools
- ❑ 17. Plastics & Polymers
- ❑ 18. Construction
- ❑ 19. University, Education
- ❑ 20. Other

4. What is the approximate number of employees in your company?

- ❑ 1 to 9
- ❑ 10 to 19
- ❑ 20 to 49
- ❑ 50 to 99
- ❑ 100 to 199
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"Reskilling people is key"

Looking at the bigger picture

Finance Minister Nirmala Sitharaman, in the recently announced Union Budget, highlighted, "As the Indian manufacturing capacity is set to rise, reskilling people to meet the newer requirements of the industry is important." Aligning with this thought, our issue this month talks about the core technologies and practises that are helping transform the manufacturing space.

Here comes our Cover Story that explains why organisations need to create an enabling work culture to influence 'Employee Experience'—a belief that people are the real catalysts of successful business transformation. That's called the 'People-Centric' approach.

Speaking about the importance of people, we are happy to introduce a new feature from this issue called 'Obscure Heroes' celebrating the contribution of lesser-known masterminds across the manufacturing industry. Other topics of focus in this issue include Data Analytics, High-Speed Machining, Frontline Digitisation, Industrial Maintenance, Air Quality in Manufacturing, etc. We have also compiled viewpoints from industry stalwarts on their Union Budget 2023 reflections.

We have also captured key takeaways from IMTEX 2023, where we witnessed a 25% increase in footfall as the event hosted itself after four years of the Covid breakdown. This was surely a revenge traveller show, where manufacturing enterprises have been rapidly embracing digitalisation and working towards the much-said digital transformation. The show saw the aerospace and defence sector emerging as one of the sunshine sectors.

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 business forward towards a successful 2023.

Team EM

MANAGEMENT NOTE

"After the overwhelming response and suggestions from our readers, we are now increasing the coverage horizon for both of our magazines

- From this issue of EM and A&D, a new section will be added with the name 'Obscure Heroes', with an intention to celebrate those great minds of innovation and manufacturing excellence who have made great deeds but received little or no recognition
- EM will soon have a column which will be named 'The Big Move' to publish top management engagements, appointments, and movements
- EM will also cover the industry updates on supply chain and logistics for the manufacturing industry
- A&D will cover industry initiatives for automation and digitisation processes, improvements, etc. across industries
- We are getting many interesting stories to cover, but due to space constraints, we are not able to cover the same in our print magazines. We will now upload those stories on our website pi-india.in, apart from the magazine stories so that our readers will not miss interesting industry coverage

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Check this space for updates on more changes/improvements in near future."

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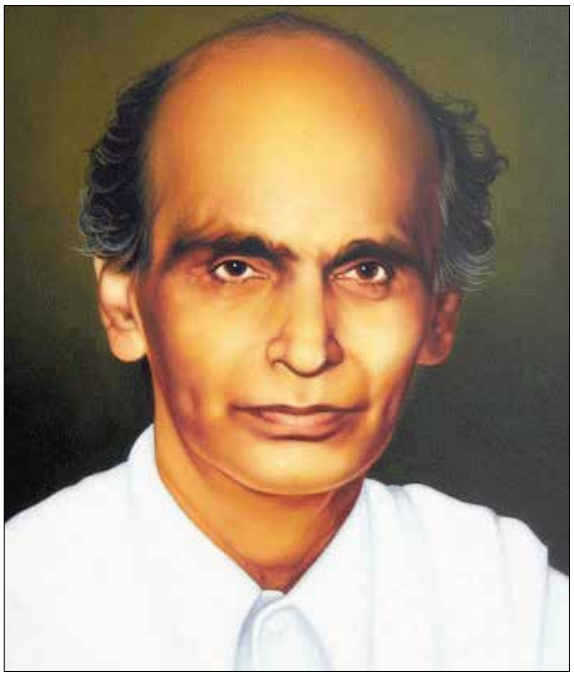
FRONTLINE DIGITISATION
Optimising businesses by digitising frontline workers



Obscure Heroes: G.D Naidu

Gopalaswamy Doraiswamy Naidu (G. D Naidu), who is referred to as 'the wealth creator of Coimbatore', was born to a Telegu family of farmers in 1893. His contributions to the manufacturing industry have been pivotal to the Industrial Revolution's success in India, and today we know him as the Edison of India.

All his life, he worked on a host of inventions that sparked growth in various sectors, such as electric, agriculture, mechanical, and automobile. Some of his innovations have transformed our working atmosphere and are still widely used in our everyday lives. A few master innovations include the kerosene-run fan, projection television, mechanical calculator, ticket vending machine, electric razor, and the country's first electric motor.

Journey of the budding entrepreneur

Interestingly, Naidu was a dropout and worked in the hotel industry to get his first motorbike at the age of 16. Soon after, he spent hours disassembling and reassembling the bike to learn more about it. The mastermind also worked as a mechanic and eventually set up his own cotton business.

Naidu joined the kitchen of British industrialist Robert Stanes from Coimbatore in 1915. As Stanes was impressed with Naidu's work, he sold him one of his old buses. Then, in 1920, he started his transportation business, called the Universal Motor Service (UMS), where he used a coach to drive between Pollachi and Palani. The company quickly gained a reputation for having the most effective fleet of public vehicles in India. By 1933, he owned a set of 280 buses and had become the largest transport business in India.

> **"TRIBUTE TO THE EDISON OF INDIA"**

It was now that Naidu started travelling to various countries, and while on his visit to Belgium, he experimented with fixing a motor from a toy car into a shaving razor. This was his turning point. His experiment with the shaving razor gave rise to 'Rasant', an electric razor, popular for its thin shaving blades. He patented this razor in Europe, where he manufactured them on a large scale. Soon he started importing the motors from Germany, and just in the first month of manufacturing, Rasant sold around 7,500 pieces. By now, his innovations were recognised on a global platform. In 1930, Naidu started an electric motor manufacturing business that gave India its first-ever electric motor in 1937.

A true philanthropist

Behind each of his innovations, he founded a company to help generate employment. He was known to establish Universal Radiators Factory, Gopal Clock Industry, Coimbatore Diesel Products and Coimbatore Engineering Pvt. Ltd., etc.

By 1944, Naidu had decided to retire and work towards welfare. At this time, he founded welfare programmes that were then known as the Industrial Labor Welfare Association, now known as G.D. Naidu Charities. His charity worked towards including practical training for students in higher education classes, intending to prepare them for employment. As a renowned innovator who had to fight his way through, he granted funds for researchers who were eager to work on prospective inventions and make a difference!

He identified people's talent and realised that it needed to be nurtured and motivated. With his remarkable contributions, he made a difference when he founded India's first polytechnic college in 1974, which was then known as Arthur Hope Polytechnic, and is now known as The Government Polytechnic College, Coimbatore.

G.D. Naidu, the great innovator, died on January 4, 1974. He was "a great educator, an entrepreneur in many fields of engineering and industry, a warm-hearted man filled with love for his fellows and a desire to help them in their troubles, He was truly a man in a million—perhaps this is an understatement," according to C.V. Raman.

– Compiled by Anushka Vani

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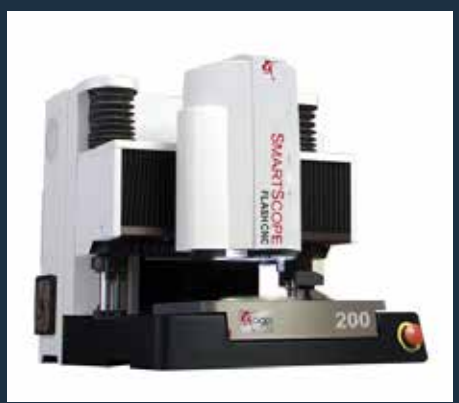


Soltec to adopt Altair technology for research and development efforts

Altair announced that Soltec, will be utilising Altair technology within its Research and Development (R&D) division. This represents a significant win in the solar energy sector for Altair. Soltec Innovations will be implementing the full Altair technology suite to deliver greater flexibility, power, and value to its engineering team compared to previous software solutions. The R&D team will use Altair's simulation, data analytics, and other capabilities to both optimise existing technology and develop new products. These products mainly include solar trackers, which orient solar panels to face sunlight, and related parts, equipment, and technology. These projects further solidify Altair's commitment to developing and improving sustainable methods of energy generation and help Soltec reinforce its status as a leader in the international solar market. James R. Scapa, Founder & Chief Executive Officer, Altair, said, "Renewable energy is going to be a foundational aspect of tomorrow's world, we're proud to have a hand in bringing about better, more efficient renewable energy technology."

Greaves Cotton posts Q3 profit to boost clean mobility

Greaves Cotton, has reported revenue of ₹514 crore in Q3 FY2023, up 6% YoY. The EBITDA came at ₹3 crore, Profit After Tax (PAT) at ₹6 crore. The company says transitioning to meet the new battery norms impacted EV production and primary revenues in Q3 FY2023. The company has also signed a binding term sheet to acquire a 100% stake through multiple tranches in Excel Controlinkage (Excel). The deal values Excel Controlinkage at 7.5x of its FY2023 normalised EBITDA for the first tranche, subject to a maximum Enterprise Value of ₹385 crore. Nagpur-based Controlinkage is said to be one of the largest players in mechanical and electronic motion control systems with an integrated capability to manufacture Push Pull cables, levers, and sensors. It's OEM customer segment includes commercial vehicles, construction equipment, agriculture, and marine, among others. Nagesh Basavanhalli, Executive Vice-Chairman, Greaves Cotton, said, "Our diversification strategy of transitioning from a metal-based, manufacturing engineering company to an electric, electronic, and mechatronics-based clean mobility technology company, continues with the acquisition of Excel."

Godrej & Boyce plans to increase its spends on technology

Godrej & Boyce, announced that its Material Handling business, plans to significantly boost investment in IoT-based technology and data, to enhance the customer experience, increase its global footprint, and increase market share. They have a total turnover of ₹1800cr, growing at a consistent 12% CAGR. The Material Handling division has recently established strategic alliances with tech giants to launch disruptive solutions that are expected to increase customer efficiency. The pilot project has shown an increase of 12–15% in customer efficiency through better utilisation of their assets, monitoring the movement of the assets, and monitoring key performance parameters such as productivity, energy consumption, vehicle performance, etc. Anil Lingayat, Business Head, Godrej Material Handling, Godrej & Boyce, said, "The advancement of technology has become a necessity for the intralogistics sector to connect, automate, and analyse the success of operations. Material Handling business has been continuously focusing on digitisation and connecting across the value chain. With new connected products, it is going to enhance the customer experience by leveraging the power of IoT, cloud, and analytics."

BorgWarner expands in Bangalore with the opening of its Electric Propulsion Engineering Center

BorgWarner has opened a 95,000-square-foot (8,825 square meters) electric propulsion engineering center in the Whitefield neighborhood of Bangalore, India. The team there will work on inverters, DC/DC converters, onboard chargers, integrated drive modules, battery management systems, and propulsion controllers. The technical center will employ more than 550 people in 2023, including several newly created positions. Speaking about the strategy on Charging Forward accelerating BorgWarner's electrification efforts, Guenther Raab, Vice President, Engineering, BorgWarner PowerDrive Systems, said, "We plan to grow electric vehicle revenues to around 45% of the company's sales by 2030 and reach carbon neutrality by 2035. The India Propulsion Engineering Center we are establishing in Bangalore will play a vital role in achieving these ambitious targets globally while setting up the foundation for future growth in electric mobility. The tech center will focus on electric propulsion systems, software, and electronics hardware capabilities including functional safety and cybersecurity in India to drive BorgWarner's global platforms."

Sumika partners with Hexagon, enabling 60% plastic carbon reduction for new vehicles

Hexagon's Manufacturing Intelligence division and Sumika Polymer Compounds Europe (SPC Europe), have partnered to digitise the performance of new sustainable automotive-grade polypropylene (PP) compounds, enabling engineers to design components that are more recyclable and offer a lower carbon footprint for future vehicles. Short glass-fiber polypropylene (GF-PP) THERMOFIL HP and recycled polypropylene (GF-rPP) THERMOFIL CIRCLE materials benefit from sustainable manufacturing and recycling processes and provide carmakers with performance comparable to incumbent engineering plastics while emitting up to 60% less CO2. A growing proportion of today's PP components are recovered and recycled compared to polyamides (PA), of which up to 70% are utilised in waste-to-energy initiatives. Speaking about the partnership with Sumika, Sridhar Dharmarajan, Executive Vice President & Managing Director, Hexagon India, said, "With aggressive sustainability targets and an increased focus on recycled materials, there is growing demand from Indian automotive companies and OEMs for sustainable materials. However, adoption has been slow because getting an accurate understanding of the characteristics of recycled materials is often a difficult proposition.

Universal Robots reports record revenue despite global uncertainty

Universal Robots has reported Q4 revenue of $85 million, bringing 2022 annual revenue to $326 million, up 5% in 2021. On a constant currency basis, growth over the year was 12%. Despite the change in global markets, overall demand for automation is predicted to continue to grow in 2023 and beyond, driven by growing labour shortages and changing workplace expectations. Kim Andreasen, Chief Financial Officer, Universal Robots, said: "We are focused on things that we are able to control, and we overcame supply chain challenges to report our highest annual revenue to date." Commenting on the growth, Kim Povlsen, President, Universal Robots, stated, "We invested last year in building world-class expertise in welding, palletising, and machine tending. We have also been working with our ecosystem partners to make automation easier for our customers than ever before. The year 2022 has been an important year for the company overall. We started construction on new headquarters, reached our 1000 employee milestone, and launched a ground-breaking new cobot."

Hitachi Terminal Solutions inaugurates its Global CRM manufacturing facility in Bengaluru

Hitachi Terminal Solutions India, recently announced that it is set to expand its manufacturing presence in India to complement the Government of India's Make in India mission through a first-of-its-kind Cash Recycling Machines (CRM) manufacturing facility in Bengaluru. Spread over 1,08,000 square feet, this state-of-the-art manufacturing facility will enable the company to triple its current production capacity of 1,000 CRMs per month. The core engines of the CRMs are localised and will now be completely assembled in India with a high level of automation in this new facility. Yoshihiro Nakatani, Managing Director, Hitachi Terminal Solutions India, said, "Our estimate indicates that more than 1.1 million cash recycling machines have the capacity to be installed globally by 2024", Bharat Kaushal, Managing Director, Hitachi India, said "India continues to remain the melting pot of innovation and growth in Asia. India has the capacity and capability to grow as the next manufacturing hub, as evidenced by the current Government's efforts to build high-end infrastructure, even in the hinterlands of India.

Machine tool orders keep growing in the fourth quarter

UCIMU-SISTEMI PER PRODURRE marked a 3.5% increase compared with the period October-December 2021. The index of machine tool orders processed by the Economic Studies Department and Business Culture Centre of UCIMU-SISTEMI PER PRODURRE marked the increase In the fourth quarter 2022. The absolute value of the index stood at 133.6 (the base year 2015 = 100). This is the new record value for the quarter under reference. The orders collected overseas grew by 2.4% compared with the same period of the previous year. The absolute value of the index was 103.9. On the domestic front, the collected orders registered a 5.4% upturn. The absolute value of the index at 257 is a new all-time high. Barbara Colombo, President, UCIMU-SISTEMI PER PRODURRE, commented, "The excellent outcome was mostly due to the accelerated purchasing decisions of end users, who completed their investment processes by the end of the year 2022 to take advantage of the tax credit at 40%, being aware that – as announced by the Government – from January 2023, the tax rate would be halved."

UCIMU-SISTEMI PER PRODURRE

"In India, a widespread of manufacturing companies actively invest in equipment as domestic demand expands"

…says **Takashi Yamazaki,** President, Yamazaki Mazak Corporation. In an interview with Neha Basudkar Ghate, he highlights that, India has a strong growth potential and the company chose Pune to set up the state-of-the-art Technology Centre, as the city has a strong engineering industry presence. Excerpts…

Please tell us the reasons for choosing India for the new factory?

With a population of approximately 1.35 billion, India continues to experience high levels of economic growth. We established our first sales office in India in 1998, and India's current GDP has increased about seven times since 1998.

Currently, in India, a wide range of manufacturing companies, including automobile, agricultural machinery, and aircraft manufacturers, continue to actively invest in equipment as domestic demand expands. Especially in recent years, as the supply chain of the manufacturing industry has been reviewed worldwide, semiconductor investment in India has been active. Combined with these trends, demand for machine tools is expected to increase over the medium to long term.

Why did Mazak choose Pune as the location for its new factory?

Yamazaki Mazak started operations in India 25 years ago. We chose Pune as our base because of the strong engineering industry presence and our existing customers. In 2011, we opened a state-of-the-art Technology Centre to give support to Indian customers. We have a strong team in Pune and therefore Pune became the natural choice of starting a manufacturing plant.

What is the initial investment, and please share with us the details of your new factory in India.

The initial investment in the Indian factory is approximately Rs 240 crores.The site area is 23 acres, or approximately 88,185 square meters, with a total floor area of approximately 23,130 square metres in the first phase.The site area is slightly larger than our Oguchi headquarters in Japan, and the total floor area is about half that of the Oguchi headquarters.

What kind of machines will be manufactured in this new facility?

We will manufacture Vertical Machining Centers. We will start with two models: VC-Ez 510 IP and VC-Ez 410 IP, with different table sizes. The new models will be added in a planned manner.

Is there any significance to the term "IP" in the product's name?

Before I speak about the product name, I would like to tell an interesting story about the project. The name internally used for this project is "MIM". The full form is 'Make in India' by Mazak'. The inspiration came from the Government of India's 'Make in India' initiative. In the product Ez stands for Easy CNC control. The Mazatrol Smooth CNC control is user friendly and less dependent on operators' skills. IP in the product name stands for India and Pune.

How do you oversee the Indian business potential with regards to your company's presence in India?

Mazak in India has a strong brand name, and our products are well accepted by Indian customers. Our various products, viz., multitasking machines, Horizontal and Vertical Machining Centers are winning the favour of our customers. I sincerely thank our Indian customers for that.

India has a strong growth potential, and we would like to contribute to its success story and grow along with it. Our opening of a factory in India is a step in that direction. The Indian economy is growing at a fast pace, and all the indicators suggest this will continue in the long run. The share of manufacturing is increasing in the Indian economy, and this will directly help the growth of the Machine Tool industry.

The establishment of this new factory will enable us to provide prompt product delivery and higher quality support. Through this, we hope to gain a share of the Indian market and contribute to the further development of the manufacturing industry in India.

In a time when sustainable solutions are being given prominence, how is the company strategising business along the same lines?

Mazak is committed to continuously bringing forward sustainable solutions. Go Green is not only for product development but also for material procurement and manufacturing activities. The company has an internal goal to reduce its carbon footprint.

Considering the physical version of IMTEX happened after three years. How did you think it fared?

IMTEX this year was very good for us. We launched two new products, which we will manufacture in our Pune plant. We received an overwhelming response from our customers for these new products. We also showcased some of our new technologies like Friction Stir Welding (FSW) for manufacturing of parts for EVs.

"Surviving and Thriving: The Resilience of Cockroach Start-Ups in a Challenging Business Landscape"

This piece sheds light on the emerging boost of Cockroach Startups thriving the business goals in context of the global conversation about unicorn startups.

Anushka Vani
Correspondent
anushka.vani@pi-india.in

Cockroach startup, a term used to describe a business that is able to withstand difficult conditions and is not easily killed off. This term has been inspired by the resilience of cockroach species, who are known for their ability to survive in harsh environments and persist even in the face of adversity. These are the companies that have a strong business model, efficient operations, and a talented team that can adapt to change and overcome obstacles. These startups have a low burn rate, meaning they can operate for a long time on a limited amount of funding, and are often able to weather market downturns and other challenges. A cockroach aims to build sustainable business that can thrive over the long term, rather than just chasing short-term gains. By focusing on efficiency and resilience, these startups aim to create value for their customers, employees, and shareholders, and to become leaders in their respective markets. The business model strategy for cockroach startups focuses on building a startup that prioritises sustainability and efficiency over rapid growth.

In practical terms, a cockroach business model is characterised by several key traits:

1. Low burn rate: Since cockroach startups prioritise efficiency, they have a low burn rate and can last for a long period with a small amount of investment. They are able to respond to market developments and be more adaptable as a result

2. Profitable operations: Cockroach startups focus on generating positive cash flow as soon as possible, so they can reinvest in their business and grow in a sustainable way

3. Customer-focused: Customer satisfaction is a top priority for cockroach startups, and they work to give their clients lasting value. This frequently results in a devoted customer base and consistent revenue growth

4. Adaptability: Cockroach startups are nimble and able to pivot quickly when necessary. They can adjust to new market situations, technologies, and client wants because they are not afraid of change

5. Long-term thinking: Cockroach startups are focused on building a sustainable business

The industry, the business plan, and the level of competition are just a few of the variables that might affect how quickly a startup in the cockroach industry grows. Cockroach startups, on the other hand, typically develop more slowly than unicorn firms, which place a premium on quick expansion and large valuations.

Distinctiveness among the Cockroach and Unicorn - Startup

In the startup ecosystem, the terms "Cockroach startup" and "Unicorn startup" are often used to describe two different approaches to building and growing a successful company. A unicorn startup is a privately held company with a valuation of $1 Billion or more.

Tech-related unicorn businesses frequently use disruptive new technologies in their business models to expand up quickly and take market share. While on the other hand, a cockroach startup will prioritise sustainability and longevity over rapid growth. These startups frequently have lower burn rates and are concentrated on developing a successful and effective business.

Interception with a conclusion

Cockroach startups may grow at a slower pace than unicorn startups, but they aim to create a sustainable business that can thrive over the long term. In conclusion, it can be said that unicorn startups focus on rapid growth and high valuations, while on the other hand cockroach startups are prioritising the company's sustainability and efficiency. Both approaches have their pros and cons, and the best approach for a given startup will depend on a variety of factors, including the industry, the business model, and the goals of the founders.

MOLDINO Tool Engineering, Ltd.

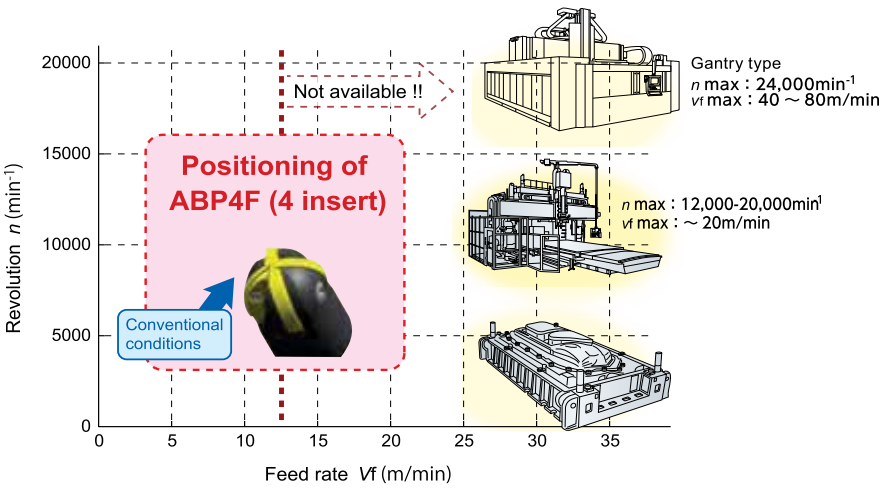
MOLDINO

ABP4F type

Ball Precision Multi Flutes ABP4F

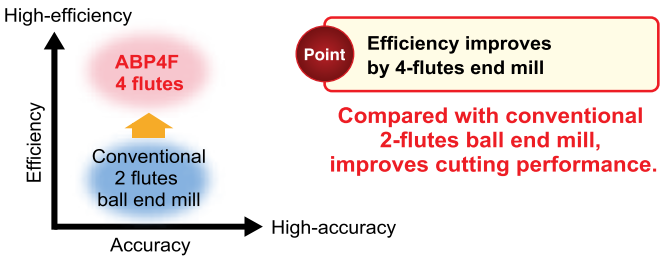
- New product: 4-flute ball end mill (ϕ20 to ϕ30) compatible with machines ranging from general-purpose manufacturing machines to the latest high-speed machines

Example of large press die for automotive parts



Processing advantage of 4-flutes end mill

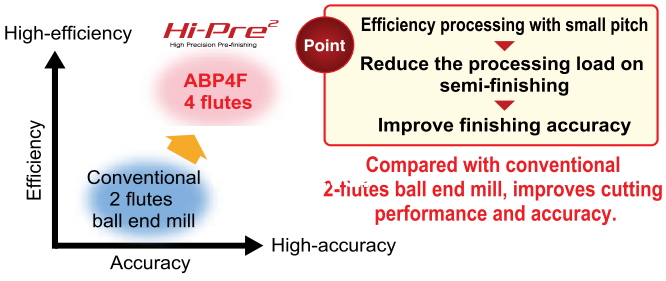
Figure Finishing



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
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YOUR GLOBAL CRAFTSMAN STUDIO

"Driving the adoption of aluminium in manufacturing"

…states **Bharat Gite,** Managing Director and CEO, Taural India. In an interaction with Sanjay Jadhav, he highlights the current dynamics of the Indian aluminium industry and at the same time talks about the parameters required to build an aluminium ecosystem in India. A read on…

According to reports, India's aluminium industry is ready for its next big revolution. What are your views on this development?

India's aluminium industry is on the cusp of exponential growth. With our current annual per capita consumption of aluminium standing at 2.7 kilograms as compared to the global per capita average of 11 kilograms, the sector has the potential to go from strength to strength in the next few years. Europe is grappling with a series of crises that have frayed the supply chain, from the Russia-Ukraine conflict to the ripple effects of the COVID-19 pandemic. As a result, the world is turning to developing countries to produce and export aluminium. Another factor propelling India's rise in the global aluminium ranks is the growing distrust of doing business with China. In addition to the global events cited above, India is uniquely placed for the transition to the next step of aluminium manufacturing.

Taural India has been providing aluminium solutions that meet the complex business requirements of the Indian defence, aerospace, railway, and other sectors. What is the key business strategy for addressing such demands in these sectors?

The next phase of the aluminium industry calls for the manufacture of extremely large and non-standardised castings. We offer end-to-end aluminium solutions to various sectors of the economy, from defence to railways and healthcare to aerospace. Our state-of-the-art manufacturing facility is equipped with a winning combination of European technology and indigenous talent. Fuelled by three generations of expertise and in-depth experience in the aluminium casting sector, we aim to drive the adoption of aluminium in manufacturing across industries.

How is your company creating an edge in the manufacturing industry with the use of advanced technology and correct expertise to provide necessary solutions across industries?

We believe that green manufacturing is the need of the hour. With the adoption of green metals such as aluminium as the preferred inputs for manufacturing across sector lines, we can do our bit to drive the switch to sustainable manufacturing. We place a high value on research and innovation, and our in-house research team is engaged in pursuing consistent and continuous improvement. I believe that our emphasis on mindful manufacturing, contribution to nation-building, extensive experience, unwavering commitment to excellence, and consistent innovation fuels the company's edge in manufacturing.

In terms of business development, what is your company's approach to building a powerful homegrown workforce, thereby, creating job opportunities in the Indian manufacturing sector?

From the onset of our journey, we have steadfastly committed to the cause of national progress and indigenous manufacturing. As such, we prioritise hiring from India and for India. One of our key focal points is the upskilling of our workforce across cadres to ensure that they are equipped with a wide array of skills that align with the latest global standards in the manufacturing sector.

We consistently try to attain and maintain global product and service quality standards. To achieve this goal, we have allianced with our European partners to provide the requisite training to our workforce. In addition, we impart skills training to our valued human resources through consistent knowledge-sharing sessions and company-wide initiatives.

A seasoned business leader, Bharat Gite is the Founder & CEO of Taural India. Bharat has received numerous recognitions for his leadership, including the "Pride of Maharashtra" award from the SME Chamber of India & being one of 30 Indian entrepreneurs at the 2020 pre-budget conference with Prime Minister Narendra Modi.

With global warming and sustainable economies being the focus today, green metals like aluminium can help manufacturers become the preferred partner. How is your company using aluminum to reduce its carbon footprints?

The war against climate change is well and truly upon us, and there is no hiding from our collective responsibility to do our bit. We have always believed in the vast potential of green manufacturing and sustainable practices. Aluminium, as a metal, is exceptionally environmentally friendly and highly recyclable. Recycling aluminium cans can save up to 95% of their energy and help us reduce our overall carbon footprint. Our commitment to sustainable manufacturing goes beyond just aluminium. From factory floors to office buildings, every facet of our operations has been designed while keeping sustainability at the forefront of our outlook. For instance, we use natural gas to melt in our furnaces and deploy energy-efficient motors into all VFD equipment to save energy. We have installed an effluent treatment plant to ensure the eco-friendly disposal of waste. In addition, our office buildings have been designed to facilitate the adequate flow of natural light and sufficient cross ventilation.

> "LOCALISING MANUFACTURING CAPACITY FOR BUSINESS DEVELOPMENT

How are you developing your business line to build an aluminium industry ecosystem in India?

Since the beginning of our journey in 2016, the company has kept the 'Make in India' movement as one of its main priorities. As such, we have been building manufacturing capacity within the nation to provide indigenous solutions, for which the country has long been dependent on international sources.

We have been successful in ending the Indian Defence Forces' three-decade-long reliance on Russia for the manufacture of crucial combat vehicle equipment. As industry leaders and innovators, our responsibility does not stop at sustainable manufacturing and nation-building. We are also tasked with community building and development.

Going forward, what would be your piece of advice to the next-gen leaders in the aluminium casting industry?

My advice to the next generation of industry leaders is to think big and think globally. One of the things young people should focus on is their education. Not only does education empower one to dream, but it also widens the horizons of what is possible. In addition to education, the next generation should also emphasise developing varied skills.

Another vital piece of advice I would give young people is always striving to add value to whatever they do. No matter the scale of the task or its relevance, 100% commitment should always be a given. Lastly, I believe young people should believe in their dreams and ambitions and keep trying to achieve them.

During your recent visit to Davos and interactions with the industry, what prospects do you see for the manufacturing sector in India? How many jobs would the manufacturing sector in India create by 2025?

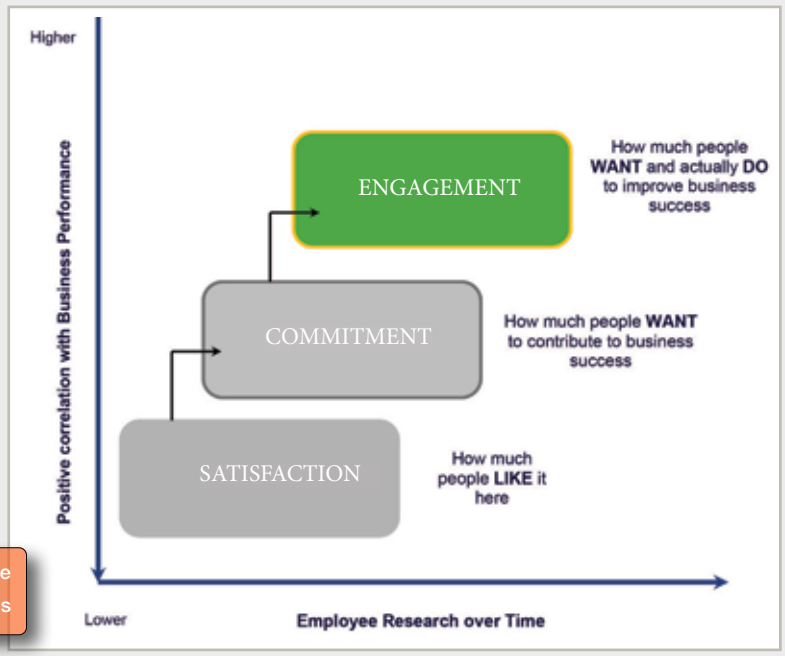
During my recent visit to the World Economic Forum in Davos, I was thoroughly impressed with the potential of the Indian manufacturing sector. India's solid local demand, a youthful workforce, and a government that prioritises local production position it as a major player in the global manufacturing landscape. Furthermore, the presence of healthy FDI inflows, consistent demand, and comparatively stable supply chains are all contributing factors to the industry's growth. As a result, manufacturers are confident in their ability to increase production to meet the demand, and the government has been relentless in creating a conducive environment for the industry to flourish. While it may be challenging to estimate the number of jobs that the manufacturing sector in India will generate by 2025, I am unwavering in my confidence that it will perform better than the global average. Discussions of a potential global recession and concerns about a skilled labour shortage do not dim my faith in India's resilience and potential for success. The International Labour Organization projects global employment growth of only 1% in 2023, half the level of 2022; however, I am confident that India's manufacturing sector will stand out as a bright spot. □

Employee Engagement & People First Approach

Images courtesy: shutterstock

The cover story portrays the need for organisations to create an enabling work culture to influence the employee experience. A read on…

Rajeev Joshi
AGM – HR & Adm,
Skoda Auto
Volkswagen India



This graph depicts employee contribution in the business

In today's VUCA world of increased Volatility, Uncertainty, Complexity, and Ambiguity, change is inevitable. On the other hand, the business world is dynamic, complex, and fast moving to embrace change for the survival and growth of the organisation, thereby, enabling organisations to constantly evolve to achieve business transformation through profit and people.

A people first business philosophy is the core of business transformation to drive business growth. Organisations tend to create an enabling work culture to influence the 'employee experience,' which comes with the belief that people are the real catalysts for successful business transformation.

The people-centric approach

- **Employee engagement** – It is about improving the employee experience by focusing on the organisation's value proposition and evolving all policies, processes, and work practises around it

- **Setting the cultural dimensions** – It is about revisiting the organisation culture, setting the pillars of culture in line with the value proposition, and cascading across the organisation to the lowest rung. (For example: customer centricity, culture of reward and recognition, etc.)

- **Bigger picture** – Connecting employees' work to the greater purpose of the business is one of the largest drivers of employee engagement

- **Communication** – According to a study, employees are more engaged when they believe they are kept up to date on what is going on in their company or organisation. Therefore, structured communication with them is important for all employees. In such a case, they feel that they are getting the desired information, which they should know, and that is how they stay engaged, which is important to gain employee trust

- **Creating opportunities** – This creates growth within the organisation by creating individual career plans for employees and linking individual performance to company goals

- **Setting a culture of reward and recognition** – This is an important aspect of employee engagement. According to global employee engagement trends, reward and recognition are one of the top pillars for employee engagement opportunities with the organisation and have an impact on employee experience

- **Policies and process** – Revisit policies and process on periodical basis, seek timely feedback on policies for possible changes, if any. As a result, influencing employee experience through employee engagement is an important aspect of businesses and organisations that strategically prioritise the employee

What is employee engagement – Need is to understand what is employee engagement and how it impacts the people first approach

Employee engagement definition – The concept of employee engagement is often confused with satisfaction or happiness. The true definition is deeper in the meaning

Marriage	Profession
Before Engagement	Advertisement / Interview Call, Interview
After Engagement	Selection and offer
Courtship	Pre joining calls, meetings
Wedding	Joining, Job description, Probation, confirmation, increment, promotion etc.

Employee engagement – Drawing parallel lines between employee engagement in marriage and profession

Employee engagement is defined as 'the level of an employee's psychological investment in their organisation'.

Engagement – A partnership in marriage and organisations

- The promises made at each stage – job advertisement, interview, onboarding to induction and actual work
- The employee is married to the job
- How are we treating the newly married bridge/groom? Are we keeping all promises made?
- At the same time, it's a partnership. So, the employees also have to give their 100 percent to their job
- Engagement is both ways

Employee engagement –Quotes

"All employees have an innate desire to contribute to something bigger than themselves" Jag Randhawa, The Bright Idea Box: A proven system to drive employee engagement.

"To win in the marketplace you must first win in the workplace" – Doug Conant, CEO, Campbell's Soul.

"There are only three measurements that tell you nearly everything you need to know about your organisation's overall performance" - Jack Welch, Former CEO, GE:

1. Employee Engagement
2. Customer satisfaction
3. Cash Flow

"In the past a leader was a boss. Today's leader must be partners with their people. They no longer can lead solely based on positional power" – Ken Blanchard.

Research indicates that employees have three prime needs:

1. Interesting work
2. Recognition for doing a good job
3. Being let in on things that are going on in the company

"Employees are the Heart of our Company" -Toyota

What is driving employee engagement?

While it is not unprecedented to have pay as one of the top opportunities to improve engagement, it is very rare to have it as one of the top opportunities. That could be a sign of intense competition for talent in the region as employees change jobs for higher pay packages. Increased talent competition and salary increases may also result in higher manufacturing costs.

Addressing reward and recognition provides organisations the greatest opportunity to improve engagement.

Engagement trends

- It is not easy to simply measure employee engagement
- Engagement is the outcome of an employee's work experience
- Understanding the top culture and work experience priorities, is the central question of all engagement indicatives

It is interesting to look at the engagement opportunities globally

o Reward and Recognition
o People and Culture
o Reputation
o Works
o Enabling Infrastructure
o Opportunity and Growth
o Employee Value Proposition
o Career Opportunities
o Work fulfilment
o Work life balance
o Performance Management
o Collaboration

Employees during a work discussion

Conventional wisdom suggests that engagement has a lot to do with one's manager and that pay, as a hygiene factor, is not very important to one's engagement.

Findings from the studies suggest some fundamental changes in the work experience and the expectations employees have of their employers.

The world is seeing changes in the external political, social, and technological environment that tap into and potentially threaten employees basic needs for fairness, belonging, trust, advancement, and support. And the top engagement opportunities appear to directly reflect the criticality of meeting these basic employee needs.

Rewards and Recognition – There will not be many organisations that can make sweeping pay or bonus increases. To address these issues of fairness, organisations would be well-served to understand real and perceived gaps of pay relative to traditional and nontraditional competitors

Employee Value Proposition – This measures an organisation's ability to articulate and deliver on promises to employees, as one of the top drivers. This opportunity is fundamentally about creating a magnetic sense of belonging to your organisation.

Career opportunities and enabling infrastructure are top opportunities. These drivers illustrate the importance of advancement and support, respectively, in a strong culture of engagement.

In addition to enabling work and providing advancement, a successful company will get pay right and be very aware of the sensitivities to inequity and mistrust in the establishment. And the best will create and deliver on a compelling employee value proposition that they will be famous for. Success will also require leaders that courageously lead the way through the ambiguity, fear, and uncertainty, of the current environment. Collectively, strength in these top opportunities creates a sustainable culture of engagement that is hard to replicate.

Employee involvement and participation

Employees are an organisation's most valuable asset because of their extraordinary influence on the company's success or failure. Moreover, management may not always hold the answer to resolving challenges and achieving business success; rather, it is the employee who holds greater potential to contribute beyond their role.

Fostering a participatory culture has various organisational benefits. Research shows that employees want to be part of the team and they want to be more involved in decisions, especially those that directly influence their work or work environment.

Employee collaboration boosts confidence among employees and management to work in a unified manner. Employees in a collaborative environment also observed to function more effectively and enjoy a healthier camaraderie with their peers. Involving employees in a decision initiates a higher level of creative thinking as people start to see the result of their involvement.

It also creates a sense of ownership among the employees, thus leading to better motivation levels, improved attitude towards work, enhanced level of empowerment, job satisfaction, creativity, commitment, and interest in staying in the organisation.

There are similar benefits to incentivizing collaboration by recognising people who help execute the ideas along with those who contribute the ideas in order to promote teamwork. □

Disclaimer: The views of the writer in the article are personal views and does not represent the organisation's view in any way" with the article

Images courtesy: AdobeStock

"Unveiling the Future"

Union Budget 2023 sets the tone for a thriving nation

The feature walks you through the key takeaways from the Union Budget 2023.

The Union Budget 2023 is a blueprint for a better tomorrow, where the government's vision for a self-reliant India is brought to life through a harmonious blend of investments in infrastructure, human capital, and entrepreneurship. It's a testament to the government's commitment to ensuring that every citizen has the opportunity to fulfil their potential and contribute to the growth of the nation. The fifth budget of Modi 2.0 was announced on February 1. It is a major boost for Taxpayers, Railway, Job creation and CapEx. Union Finance Minister Nirmala Sitharaman presented the Union Budget 2023 as the last full-fledged budget before the next general elections in 2024.

According to Sitharaman, "The Indian economy is on the right path and heading towards a bright future." She called this year's budget as the 'first budget of the Amrit Kaal,' on the background of the Economic Survey, which pegged India's economic growth forecast between 6% and 6.8% for FY 2023–24.

Key takeaways

In this session, Sitharaman announced major tax slab changes under the new tax regime, along with a big hike in allocation for railways and capital expenditure. The Indian government increased its capital spending by 33% to 10 trillion rupees ($122 billion) to enable the country to expand its network of roads, ports, and airports, making it an attractive destination for investors.

Owing to the recessionary fears, the Ukraine war, the global food and energy crisis, monetary tightening, tension over Taiwan, disrupted and shifting supply chains, pandemic recovery, etc. have startled the global economy in FY23 and left governments all over the world grappling with economic consequences.

A substantial budget of ₹19,700 crore has been allocated for the National Green Hydrogen Mission to reduce India's dependency on fossil fuel imports and encourage green mobility.

Furthermore, customs duty has been waived on capital goods imported for the manufacture of lithium-ion batteries in order to boost domestic EV production.These steps will go a long way towards boosting the EV sector in India and the automotive sector at large, which is still recovering from the pandemic losses.

The Budget has also emphasised on increasing ease of doing business with various new schemes being introduced key measures listed below:

- PAN of establishments to be used as a 'common identifier' for specified government agencies
- A system of 'Unified Filing Process' for submission of common information to different Government stakeholders
- Setting up of a centralised data processing centre for faster handling of administrative work under the Companies Act etc.
- India is poised to outshine other countries with this Budget 2023 further encouraging 'Make in India', change in India's energy mix and ease of doing business

What does the industry say…

Sudhanshu Mani,
Creator – Train-18 Vande Bharat Express,
Retired General Manager
Integral Coach Factory (ICF)

"The budget presented for the Indian Railways(IR) is quite exciting. The highlighted banner lines are the capital outlay of ₹2.4 lakh crore, which the finance minister said was the highest ever and nine times higher than that in 2013-14 (let it be clarified that is the highest ever also in terms of GBS or Capital Support from Budget of GoI and that too by a big margin, from ₹ 1,59,300 to this level). Another important announcement was about a hundred critical transport infrastructure projects, some of which would presumably and hopefully involve railways.

As expected, a more than 20% YoY rise in revenue has been projected. This is a good sign, but not one to be exuberant about. Since fiscal 2021–22 was badly affected by COVID–19, a comparison of earnings and expenditures with 2018–19, the last year without any COVID impact, shows the CAGR for earnings to be barely over 5%, whereas expenditure is close to 5%. In an economy growing at the rate of 6 to 7%, one would like to see IR's growth in revenue be around 13 to 14%. IR is nowhere near this yet, and the recent initiatives of Gati Shakti and NLP have yet to show a positive impact on increasing IR's intermodal share and revenue.

The CapEx has increased manifold since 2014—nine times, to be precise, as spoken in the budget speech. EBR (Extra Budgetary Resources), or borrowings, have been kept to a minimum of ₹17000 cr by increasing GBS (General Budgetary Support). This appears to be a good thing, as IR's borrowings have more than ₹4 lakh cr, and IR can hardly afford the high interest burden. The government seems to believe that if the government supports or IR borrows only for investment and not for running expenses, it is justifiable for the overall economy of the country as the resultant growth justifies borrowings for investment. At the same time, at some point, these investments must translate into higher revenue, and this should start happening soon. There is no clarity about the proposed 100 last mile transport infrastructure projects; one hopes that some would involve railways."

Sunil Mathur,
MD & CEO,
Siemens Limited, India

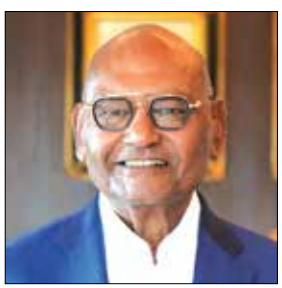
"The inclusive, growth-oriented budget builds on the foundation of previous years and is consistent with the government's efforts to maintain macro-economic stability while focusing on growth. The increase in investments in capital infrastructure, including 'Green Growth', sustainable cities and railways and transport infrastructure will give the necessary boost to the domestic economy. I also welcome the enhanced support for MSMEs, exports, domestic manufacturing and value-add, technology, and youth, which are all imperative to maintaining India's economic growth."

Bharat Gite,
Founder & CEO,
Taural India

"Finance Minister Nirmala Sitharaman has emphasised that infrastructure, investments, and green growth are among the government's seven priorities. The unified Skill India digital platform gives hope for the right workforce development and industry connection. The big picture focus of the budget is growth, with a big boost in capital investment thanks to a 33% increase in allotment, the highest ever budget for the Indian Railways, and MSMEs as the engine of growth. This is accompanied by the excitement of a push to indigenisation in the mobility sector, with the budget announcing a 60–70% rise in fully imported luxury cars and EVs. As manufacturers of aluminium casting, which has wide applications in all these key industries, I am hopeful that this budget will usher in many key opportunities for the adoption of aluminium solutions."

Anil Chaudhry,
Zone President, India
CEO & MD,
Schneider Electric India

"The FY24 budget lays a strong foundation for the sustainable development of India in the Amrit Kaal. To achieve net-zero emissions by 2070, it focuses on energy transition and decarbonisation of the economy with a sizeable allocation of ₹35,000 crore. Globally, India ranks fourth in installed renewable energy capacity, and the budget will give a further fillip to the addition of capacities in areas like wind and solar. Key measures are being taken to support green growth, including viability gap funding for battery storage, renewable energy evacuation, the National Green Hydrogen Mission, and green credit policy. With an investment of ₹10,000 crore, the budget also underlines the need for embracing a circular economy through the GOBARdhan scheme. Furthermore, setting up three centers of excellence for Artificial Intelligence is a welcome step from the government."



Anil Agarwal,
Chairman,
Vedanta

"This budget is one of the best budgets ever, truly inclusive and addresses the aspirations of every section of society. It empowers India's 1.4 billion people as drivers of the India story. I compliment the PM and FM for the long-term vision that was laid out in the budget speech as well as the many progressive announcements, like increased outlay for capital expenditure, incentives for start-ups and MSMEs, green energy, a lower tax for the middle class, and a boost to tourism, which will create massive jobs and reinforce India's position as the fastest-growing major economy in the world."

T.V. Narendran,
CEO & MD,
Tata Steel

"The finance minister has presented a high-quality budget that focuses on increasing capital expenditure to build infrastructure, while at the same time not compromising on the fiscal discipline that is so essential in an era of rising interest rates. The minister has also taken multiple actions to support the agriculture sector and the rural economy. The focus on health expenditure also assuages the concerns of the underprivileged sections of society about unplanned medical expenditure. There is also a more holistic focus on logistics, with significant investments in the railways as well as proposed work on coastal shipping. The budget also allocates resources for the long-term and important transition to a greener future. The support for the tourism sector and for MSMEs was also much needed, as these sectors suffered the most during COVID. Overall, a well-rounded budget with something for everyone."

Stefano Sanchini,
Managing Director,
Bridgestone India

"The government's proposal to increase the capital expenditure outlay by 33% is a welcome move as this will directly impact the logistics and mobility sectors. These sectors would also grow as they expand to serve the enhanced demand for goods generated by new infrastructure projects. The Finance Minister's statement on replacing old government vehicles will increase the demand for new vehicles, and we are committed to supporting the OEMs to meet this demand."

Santosh Iyer,
MD & CEO,
Mercedes-Benz India

"The Union Budget 2023 should drive demand as it focuses on boosting consumption by increasing the disposable income of taxpayers. Further, increased capital expenditure on infrastructure, particularly roads, should also create demand for the automotive sector. The change in basic custom duties is however going to impact the pricing of some of our select cars like the S-Class Maybach and select CBUs like GLB and EQB, making them dearer. However, as we locally manufacture most of our models, this will not affect 95% of our portfolio. The focus on sustainability in the budget is commendable, and initiatives like extending the customs duty exemption of capital goods and machinery to manufacture lithium-ion cells for EVs is a step in the right direction, as it will consistently drive green mobility in the country."

Rajeev Sharma,
Chief Strategy Officer,
Mitsubishi Electric India

"The budget is oriented towards the economic growth of the country. I am sure that a 33% growth in capital expenditure will result in balanced development. This is a smart move since it will help the country achieve its goal of becoming a five trillion-dollar economy and a global powerhouse. I believe that the announcement of setting up 100 labs to effectively develop 5G services and the vision to promote Artificial Intelligence in all industries is a strong step by the government. This will further lead to automation in the industries, which will help propel India's growth and promote smart cities. The Union Budget 2023 has come up with positive announcements for different sectors to support the 'Make In India' initiative and can result in balanced growth shortly."

Anil G Verma,
Executive Director and CEO,
Godrej & Boyce

"This is a balanced and inclusive budget that will provide further impetus to growth. The renewed thrust on investment in infrastructure will drive the productivity of our economy and generate employment. Our competitiveness in the global economy will also be improved through the thrust on research in fields like 5G services, AI and agriculture. Together with the initiatives to reduce the compliance burden and de-criminalise several regulatory provisions, it will improve the ease of doing business in India and attract fresh investments. The green growth focus will orient the entire economy towards adopting sustainable practises in all areas and put us in a good position to play our role in the efforts to improve the future of our planet. The key to realising the planned outcomes is effective implementation."

Anirudh Bhuwalka,
CEO,
Blue Energy Motors

"With the government's focus on green mobility, the automobile sector and other segments that are in line with the mission of providing green solutions will get a boost from an overall growth and sustainability standpoint. The exemption on the excise duty on GST on compressed biogas and the import of capital goods and machinery for batteries used in electric vehicles will propel the growth in the segment and enable industry players to further enhance their productivity. The overall initiative will augment the energy transition and drive the agenda for climate change, along with lowering carbon footprints in the country. In addition, the collective efforts of the government and industry players will help the government achieve its vision of becoming net-zero by 2070."

Dr. Venkat Mattela,
Founder & CEO,
Ceremorphic

"The new budget is well designed to unleash innovations in the Artificial Intelligence (AI) space for India. Setting up labs for 5G services in engineering institutions is a neat idea, as it helps in getting experience in product development early on in the educational process. Capabilities and expertise in Industry 4.0 are key to robust economic growth and lifestyle enhancement in the future, and the new Pradhan Mantri Kaushal Vikas Yojana 4.0 along with the Skill India Digital platform will not only increase the skill set in various areas like AI coding, robotics, mechatronics, the IoT, 3D printing but will also encourage more product development in Industry 4.0 going forward. Additionally, setting up a Central Data Processing Centre is a welcome act to create a smoother and faster way of getting things done for enterprises.

Continued support for manufacturing is paramount and is well supported by the new targets for increased mobile phone production and the relief of customs duties on critical parts needed to build peripheral AI interfaces. Low-power engineering is the game to play in the next few decades, and new architectures will be created where hybrid solutions will be created with lithium batteries along with new architectures that will enable overall energy savings for the total solution.

Concessions on duties on the lithium-ion-cells is a key decision to encourage new product development in Industry 4.0. And last but not least, in tandem with sustainability goals established at the G20 summit and a global consensus on reducing carbon emissions, the National Green Hydrogen Mission will facilitate a transition in the economy to low carbon intensity and reduce dependence on fossil fuel imports to drive sustainable growth in the manufacturing space. The Green Credit Program will serve as a step towards accountability at both the macro and micro levels."

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Images courtesy: iStock

Optimising businesses by digitising frontline workers

Neha Basudkar Ghate
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Industrial Digitisation has been quite a buzz, but digitisation of the frontline workforce has never been more important than it is today. This article summarises how digitally enabled and empowered frontline workers should be, as they have the potential to completely transform the business functionality and deliver value through increased productivity, collaboration, speed, accuracy, and quality.

Changing the dynamics of the workflow, digital transformation has taken hold everywhere from the huge manufacturing floor to the smallest of enterprises. In this boom, human workers are the ones that make up a critical and integral part of the manufacturing equation. Therefore, it is rightfully significant to digitise the frontline workers, as they are a key part of the manufacturing industry.

Who are frontline workers?

Frontline workers in the manufacturing industry contribute to production by operating machinery, assembling products, and performing quality checks. They are also responsible for maintaining clean work environments and following safety protocols. Frontline workers may also be involved in maintenance tasks, such as replacing worn-out parts or conducting preventive maintenance on machines.

Additionally, they can play an important role in monitoring production processes to ensure that all products meet quality standards and customer requirements.

What is frontline digitisation?

In the manufacturing sector, digitising the company's

Implementing digitisation among the frontline workforce

frontline workforce can offer a wealth of benefits. By leveraging technology, organisations can streamline processes and increase efficiency across their operations.

Here are just a few ways that manufacturers can digitally transform their frontline workforces:

1. Automated workflows: Automating repetitive tasks such as data entry or document management helps eliminate manual errors and allows workers to focus on higher-value activities that require more critical thinking. This increases overall productivity and reduces operational costs associated with manual labour.

2. Mobile applications: Enabling field technicians to use mobile devices for service requests or maintenance issues greatly improves visibility into what is happening in the field, allowing managers to make better decisions about where resources should be spent. Frontline digitisation is the process of using digital technology to improve customer service, increase efficiency, and reduce costs. It involves leveraging digital technologies such as AI, Machine Learning, Robotics, Analytics, and Cloud Computing to create a seamless user experience across all channels.

This enables organisations to provide customers with better services while also reducing operational costs. Moreover, it can help businesses automate processes and streamline operations to save time and money while providing quality services that meet customer expectations.

Digitising front-line workforce in manufacturing

Digitising the frontline workforce in the manufacturing sector refers to using digital technologies and tools to improve operational efficiency and reduce costs. This process typically involves introducing new software systems, automation, robotics, sensors, data analytics, and other technologies that help streamline production processes. These solutions can be used for a variety of tasks, such as tracking inventory levels, automating order fulfilment processes, improving quality control procedures, creating more efficient supply chains, and optimising scheduling tasks.

By digitising the frontline workforce in the manufacturing sector, businesses can gain real-time visibility into their operations, helping them identify areas where improvements can be made quickly and cost-effectively. Additionally, it allows them to create safer working environments by reducing manual labour requirements, as well as provide better customer service due to faster delivery times.

Helping industries succeed

Frontline digitisation is assisting manufacturing industries in succeeding by enabling Predictive Maintenance and making better use of resources. Automation technology such as robotics, Automated Guided Vehicles (AGVs), and Computerised Numerical Control (CNC) machines is also being used to reduce labour costs while increasing output.

Furthermore, digital twins can be used to simulate production processes before they are implemented to identify potential issues and optimise performance. Finally, Artificial Intelligence (AI) is being employed for tasks such as quality assurance and inventory management. All these technologies combined can help manufacturers improve efficiency and productivity while reducing costs.

Benefits of the digitising

1. Increased efficiency: Digitisation helps to reduce manual labour, minimise errors, and improve accuracy in the manufacturing process. This leads to increased efficiency and cost savings for the organisation

Frontline processes enhancing work efficiency and accuracy

2. Improved quality control: By digitising processes, manufacturers can take advantage of automated quality control systems that help ensure products meet customer specifications more accurately and consistently over time.

3. Enhanced inventory management: With frontline digitisation, manufacturers can better manage their inventory by tracking stock levels in real-time and streamlining order fulfilment processes for faster delivery times

4. Reduced paperwork: Automation of paperwork reduces the paperwork burden on employees as well as improving visibility into operations so that any potential problems can be identified quickly before they become a bottleneck

How to digitise frontline workforce in manufacturing?

1. Invest in mobile technology: Equip your frontline workers with mobile-enabled technology such as tablets, smartphones and wearables like smart glasses to enable them to quickly access information while they are on the manufacturing floor. This will give them instant access to work instructions and other resources that can help improve productivity, accuracy and safety

2. Implement automation solutions: Leverage automation solutions like Robotic Process Automation (RPA) or Industrial Internet of Things (IIoT) solutions for tasks such as inventory management, data entry or quality control checks that can be automated for better efficiency

3. Create digital workflows: Use digital workflow tools such as Enterprise Resource Planning (ERP) systems.

Surveys and research

In a survey conducted by the Harvard Business Review, 87% of the survey respondents said their organisation will be more successful when frontline workers are empowered to make decisions in the moment. Further, 86% say that frontline workers need better technology-enabled insight to be able to respond to real-time events.

Reinforcing that premise, Webalo recently conducted a webinar with 451 Research on how digitising the frontline workforce is mission-critical. So far, we have seen the challenges that exist in digitising the frontline workforce. They emanate from the very way in which organisations are structured, how they function, and how they have initially approached digitisation—more as a piecemeal endeavour instead of the all-encompassing project it should be.

Empowering business models with digitisation

It is crucial to create a workforce, especially frontline workers, that is digitally sound. Frontline digitisation in the manufacturing industry is a major milestone for businesses. Additionally, it provides an opportunity to gain greater visibility into operations by enabling real-time insights for improved decision making. The future looks bright for manufacturers that are willing to embrace these digital transformation solutions catering to their workforce, as they promise significant cost savings with increased operational effectiveness. □

Images courtesy: shutterstock

The Need for Speed!

The article talks about the advantages of using High-Speed Machining (HSM) in a manufacturing process wherein cutting tools are used to remove material at high speeds and feed rates.

In traditional machining processes, cutting tools rotate at relatively low speeds, typically less than 1000 RPM. However, in high-speed machining, cutting tools rotate at much higher speeds, typically in the range of 10,000 to 60,000 RPM. This high-speed rotation creates a small and concentrated cutting zone, allowing for faster material removal and improved accuracy. The high-speed machining process requires specialised cutting tools and equipment, as well as specific materials and techniques. The cutting tools used in high-speed machining are typically made from High-Speed Steel (HSS) or Cemented Carbide (WC-Co) materials, which can withstand the high heat generated during the process. Additionally, the cutting tools are coated with special materials such as Titanium Nitride (TiN) to improve tool life and reduce friction between the tool and the workpiece.

Application benefits

One of the major advantages of High-Speed Machining is the increased production rate. The high cutting speed and feed rate allow for the removal of material at a much faster rate than traditional machining processes, resulting in a shorter overall machining time. This increased production rate also reduces the cost of production, as fewer tools and machines are required to produce the same number of parts.

Another advantage of High-Speed Machining is the improved surface finish and accuracy of the machined parts. The high cutting speed and feed rate produce a small and concentrated cutting zone, which reduces the impact of tool wear and vibrations. This results in a smoother and more accurate surface finish, as well as improved dimensional accuracy.

High-speed Machining also has a significant impact on productivity and efficiency. By reducing the machining time and increasing the production rate, this technology allows companies to meet the growing demand for complex parts in a timely and cost-effective manner. This results in increased competitiveness in the market, as well as improved profitability for the companies

High-speed machining tools providing quality assurance

that utilise High-Speed Machining.

Also, it reduces the need for secondary operations. The high accuracy and surface finish of parts produced through this technology often eliminate the need for additional operations such as grinding or polishing. This not only reduces the overall cost of production, but also results in improved consistency and uniformity in the final product.

In terms of sustainability, High-Speed Machining also offers advantages. The increased efficiency and reduced need for secondary operations result in lower energy consumption and reduced waste. Furthermore, this technology frequently employs specialised cutting tools and techniques that are designed to reduce environmental impact, such as reduced emissions and water usage.

Factors to consider when selecting a High-Speed Machining tool

When selecting a High-Speed Machining tool, there are several factors to consider, including cutting speed, tool material, tool geometry, and tool coating. The following are some of the most important factors to consider when selecting a high-speed machining tool:

1. **Cutting Speed:** Cutting speed is one of the most important factors to consider when selecting a High-Speed Machining tool. The cutting speed must be high enough to achieve the desired results but not so high that it causes excessive wear on the cutting tool

2. **Tool Material:** The tool material is also an important factor to consider when selecting a High-Speed Machining tool. High-speed steel and carbide are the most common materials used in High-Speed Machining tools due to their ability to withstand the high temperatures and forces generated during high-speed cutting. The choice of tool material will depend on the specific application and the desired cutting results

3. **Tool Geometry:** The tool geometry is also a critical factor to consider when selecting a High-Speed Machining tool. The geometry of the tool will determine its cutting characteristics and will affect the speed at which it can be used. Common tool geometries include ball-nose, corner radius, and square-end milling cutters

4. **Tool Coating:** The tool coating is also an important factor to consider when selecting a High-Speed Machining tool. The coating on the tool can improve its cutting performance and reduce wear. Common coatings include TiN, TiCN, & AlTiN

Trends witnessed

In terms of advancements in High-Speed Machining, there has been a growing trend towards the development of it's centers. These machines combine the high cutting speed and feed rate of traditional high-speed machining with advanced features such as multi-axis capabilities, improved cooling and lubrication systems, and advanced control systems. These advancements allow for even greater precision, accuracy, and versatility in the machining process, resulting in the production of even more complex and intricate parts.

Another trend in this technology is the development of advanced cutting tools and materials. Companies are continuously developing new and improved cutting tools, such as ceramic cutting tools and diamond-coated cutting tools, which offer improved durability, wear resistance, and cutting performance.

HSM tools used in the cutting tool industry

Additionally, new materials, such as high-temperature alloys and composites, are being developed to allow for high-speed machining of a wider range of materials. The cutting tool industry has embraced HSM due to its numerous benefits and applications. The following are some of the most common applications of HSM in the cutting tool industry:

1. **Aerospace Industry:** HSM is widely used in the aerospace industry to produce aircraft parts, such as landing gear and structural components. The high precision and intricate shapes that can be produced with HSM make it ideal for use in the aerospace industry

2. **Automotive Industry:** HSM is also widely used in the automotive industry to produce engine components, such as camshafts, crankshafts, and transmission components. The high cutting speeds and precise finishes produced with HSM make it ideal for use in the automotive industry

3. **Medical Industry:** HSM is also commonly used in the medical industry to produce medical implants and devices, such as pacemakers, stents, and artificial joints. The high precision and intricate shapes that can be produced with HSM make it ideal for use in the medical industry

4. **Mould and Die Industry:** HSM is also widely used in the mould and die industry to produce moulds and dies used in the manufacture of plastic and metal products. The high precision and intricate shapes that can be produced with HSM make it ideal for use in the mould and die industry.

However, High-Speed Machining is not without its challenges. One of the biggest challenges is the need for specialised cutting tools and equipment. The high cutting speed and feed rate require cutting tools that can withstand the high heat and stress generated during the process. Additionally, the specialised equipment required for High-Speed Machining is often more expensive than traditional machining equipment.

Another challenge is the need for specific materials and techniques. The high cutting speed and feed rate generate high heat and stress, which can cause tool failure and reduced tool life. To mitigate this, specific materials and techniques must be used, such as cooling and lubrication, to reduce heat and stress.

It is also important for companies to carefully consider the benefits and challenges of High-Speed Machining before investing in this technology. While the technology offers numerous advantages, it is not the best solution for every application. For example, it may not be the most cost-effective solution to produce low-volume, simple parts. Additionally, High Speed Machining may not be feasible for certain materials or workpiece geometries, as the high cutting speed and feed rate can result in unwanted stresses and deformations.

Despite these challenges, the technology has become increasingly popular in the cutting tool industry due to its numerous benefits. The demand for high-quality, complex parts in various industries has driven the growth of High-Speed Machining, as it allows for the production of precision parts with improved accuracy and surface finish.

High-Speed Machining is a cutting-edge technology that offers numerous benefits in the cutting tool industry, including an increased production rate, improved surface finish and accuracy, a reduced need for secondary operations, and improved sustainability. However, companies must carefully consider the benefits and challenges of the technology before investing in this technology, as it may not be the best solution for every application. □

Courtesy: TaeguTec India

Decoding Industrial Maintenance in the manufacturing realm

The feature gives an overview of upkeep strategies today while detailing the advantages of Industrial Maintenance.

Vedant Goel,
Managing Director,
Neo Mega Steel

Industrial Maintenance, variously called plant maintenance, maintenance, and planned downtime, among others, is the process of refurbishing existing plants, equipment, and machines to their expected working condition such that they remain in shape for production with reduced unplanned downtime while churning out quality products with a certain speed, reliability, and certainty. On the significance of production machinery, it is well known that they play a significant role in an organisation's survival and sustenance. They are the ones who bear the burden of corporate existence. For this reason alone, a viable maintenance plan is necessary, given that it reduces overall costs, maximises production, and, in the long run, results in a marked increase in profitability.

Up until a few years ago, viable Industrial Maintenance meant an outsourced 3rd party contract that, though feasible under certain conditions, wasn't always the best option, especially when the equipment was complicated and needed lots of parts and sub-systems. In such cases, the user organisation had no choice but to keep Industrial Maintenance within its purview. With the backing of the right experienced personnel, it gave the designated equipment a more prolonged, trouble-free life while reducing maintenance costs in the long run.

What are the current maintenance strategies?

Maintenance is an ongoing act that requires a degree of deftness brought about by the right strategies. Among others, the following forms of maintenance are most common in industries worldwide.

Reactive maintenance: The words being suggestive enough, it stands for maintenance that takes place as a reaction to something, which could either be a complete breakdown or a significant slowdown. While it may seem a disadvantage given the extended

With technology changing for the better, older machines must be retired and, where possible, scrapped

downtime the machine or equipment may demand on account of large-scale wear-outs, specific machines, like sealed turbines, may need maintenance only when they are entirely worn out.

Preventive Maintenance: PM is just the opposite of reactive maintenance in that it does not come into action only when a complete breakdown occurs but instead takes place proactively against fixed schedules and calendars. An example is regular vehicle maintenance by way of oil and filter changes based on months or kilometres of use.

It scores well because it keeps the equipment running for a long time, with downtimes having very short durations. Converting capital expenses into a series of operational costs reduces overhead and makes maintenance and production much more sustainable while also factoring in safety and higher productivity. That said, even PM has its disadvantages. First, what if the machine is old and ideally destined for the scrap yard? Is there a point in constant repairs whose frequency and costs would only increase? That aside, regular and scheduled repairs may necessitate the replacement of parts that still have a substantial life. What could bring about the best of both worlds is data science and technologies like IoT, where machines by themselves "declare" their status and proactively "ask" for help!

Reliability-based maintenance

A specialised form of proactive maintenance that is a mix of the previous two, the RBM form analyses the consequences of failure and the likely reasons that might bring about such an event and, based on the two, formulates a strategy for effective maintenance. For example, a chilling plant could have a mix of free-standing fans and a cooling plant, each needing its own kind of maintenance. A simple fan going off may not have the same effect as a compressor going off, with both getting differing treatments for maintenance.

Given that they don't treat maintenance as a standard action, reliability-based maintenance is about putting effort into understanding assets, their workings, and their vulnerabilities, and only then forming strategies. Information being the key, RBM depends a lot on technologies like IoT devices, RFID tags, Industry 4.0 and the like that feed data into Big Data and AI-based systems that decipher trends and make predictions about time, circumstances, and the kind of maintenance that can be expected. Aiding RBM these days are technologies, including virtual machines and digital twins, that mimic the working of actual devices. In doing so, they generate much-needed data on a machine's working and, by extension, on maintenance-related matters.

Advantages of Industrial maintenance

Maintenance is a necessity, be it for the living or the non-living, and is a consequence of the activities they do that bring about such maintenance. In short, if it matters, it ought to be maintained! And if it's a system that generates an income and runs an entire industry, there is every reason for it to undergo maintenance as a dedicated activity. Reasons necessitating industrial maintenance include:

1. Security

Security, whether physical or financial, is something that industrial maintenance guarantees to a considerable extent. Assets and machines that are maintained the right way are less of a hazard than those that aren't. Besides, assets maintained

Undergoing maintenance is a dedicated activity

in the right way also provide financial security for a longer duration, with the output being up-to-the-mark, timely, and in the required numbers. Instances of well-maintained assets have shown time and again that for the life of the machinery.

2. Product quality

Assets in the industrial scenario, most of which constitute machinery, when maintained the right way, generate output despite being old! Add to that the possibility of retrofitting. Expensive machines like power generating sets and those in production industries like mining and smelting, though old, aren't disposed of regularly given their capital nature and consequent heavy outlays.

3. Cost reduction

Well-maintained production assets give back their money's worth by producing a consistent output of high standards that command the right price in the market. Calculated against outlays in maintenance, the cost per piece of output sees a consistent reduction over the asset's life.

4. Asset availability

Finally, organisations procure and use assets for gainful output. If, for lack of maintenance, it can't provide the same, the whole point of its existence is lost. On the other hand, assets that get their share of maintenance remain available for output. This, in a way, ensures an enterprise's survival, growth, and name.

Can industrial maintenance also be harmful?

While industrial maintenance is a necessity for existence and even growth, there can be instances when it is counterproductive. Among others, this takes place when the activity is:

Unplanned: Industrial assets of the production kinds are invariably complicated machines that need planned handling that leaves very little to chance. It may call for specialised equipment, personnel, and spares that may not be available off the shelf. Things done unplanned without the right resources in place could end up hurting the machine and, by extension, the owners' interests.

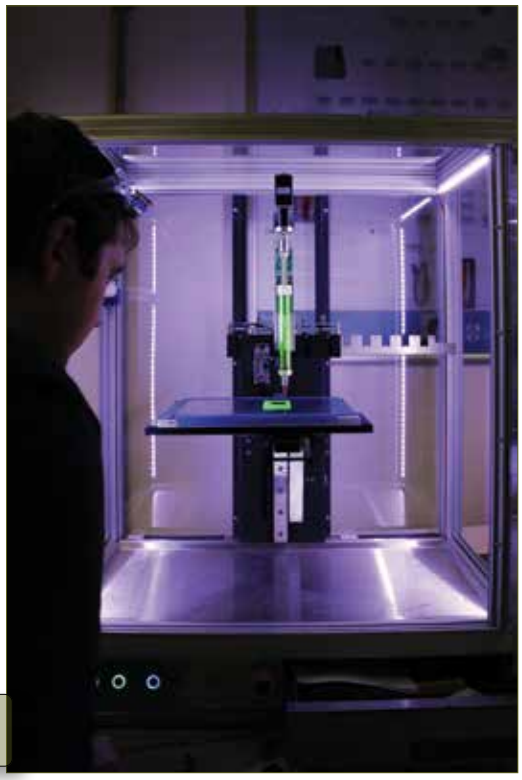
Unsupervised: As an extension to the above point, industrial maintenance, if executed unsupervised, may end in disaster. The perfect example could be the case of the Chernobyl nuclear power station in Ukrainian SSR in the Soviet Union, where they tried regular maintenance in the absence of the right personnel, i.e., senior scientists. The result is there for the world to see, suffer from, and cope with—to this day!

Outdated machines are being kept alive: With technology changing for the better, older machines must be retired and, where possible, scrapped. Take the case of single-hulled crude-oil tankers. In almost all the oil spills that have caused enormous environmental disasters, ships of this kind have been the cause. Had they been destined for the scrap yard in time, such needless accidents could have been avoided entirely.

With so much riding on industrial maintenance, the future holds much promise in the form of:

1. Additive Manufacturing in maintenance

Also called 3D Printing in common parlance, the technology is ushering in a new era in industrial maintenance, especially of machines whose parts are difficult to procure,



Additive Manufacturing in maintenance

either due to technical reasons or vintage. Either way, a 3D printer with a solid rig and suitable raw material can make the difference between the life and death of certain machines. As far back as 2014, a PwC report stated that nearly 50% of industrial entities use or contemplate using 3D printers to procure a stream of essential parts. That aside, independent production of parts using 3D Printing is helping to re-design them to perfection to suit specific needs.

2. Internet of Things, wireless sensors and data collection

Data, being the new oil, is now old. What's new is its status as a breath of fresh air. Data helps keep machines, production, and maintenance in line with needs. And today, data is gathered from multiple sources, including the Internet of Things, wireless, and a whole lot of other means. Aside from data collection, these systems communicate among themselves to understand their own needs and provide up-to-the-minute information about asset conditions for the right actions. With machines themselves doing it, industrial maintenance has entered a new era of being "hands-off" while handing down various benefits.

3. AR and VR for maintenance and training

Technologies, including the "Digital Twin" with the extensive use of sensors, can today show the exact internal workings of machines in real-time. From aircraft engines to base-load industrial generators, everyone uses these to pinpoint things like part failure and timely maintenance. It brings about "Just-In-Time" maintenance that helps retain parts that have life in them while changing only the absolute essentials, thus, lowering costs while augmenting production capacities over the life of assets.

4. Maintenance as a service

Data collected at the right time, in the right quantities, and of the right kind is changing how the world looks at maintenance. Among other things, it has made maintenance of industrial machines a daily activity. With a profusion of context-specific manuals, videos, and bot-related support, maintenance is today "on demand" and "as a service,", a distinct change from the Annual Maintenance Contracts most industrial machinery owners are so used to. The idea is to create a paradigm shift in the way services are delivered while remaining fast, versatile, and highly specific to machines and their functions. Vehicle makers are using this feature to provide "Just-In-Time" maintenance to their customers.

5. Collaborations in the field of supply chains

MNCs supply industrial plants all over the world. With offices, warehouses, production, and sales spread across the globe, this is bringing about a new understanding of maintenance logistics, where existing supply chains of manufacturers tie up with 3PL and 4PL providers to reach end-customers seamlessly to service their often-varied needs. It is helpful to both the customer, i.e., industrial entities who get their needs fulfilled at the right time, the vendor, and 3PL and 4PL providers who know the exact needs of their customers, when, where, and why. Tied down to the ERP, WMS, Inventory Control and Asset Management Systems, it makes supply chains far more visible, robust, and immensely more resilient. □

IMAGE COURTESY: shutterstock

The landscape of Cybersecurity in the manufacturing sector

With the manufacturing sector witnessing an increasing number of cyberattacks, firms need to devise a holistic cybersecurity framework to keep their production safe from potentially damaging data theft and illegitimate access.

Kunal Bajaj,
Chief Business Officer,
eSec Forte

The fourth Industrial Revolution has opened new possibilities for innovation and growth in the manufacturing sector. The integration of new-age technologies are bringing fundamental changes in the way today's manufacturing firms produce, operate, and sell to their target markets. Especially, the enhanced use of Artificial Intelligence (AI), Machine Learning (ML) and Automation are changing the very face of the industry and paving the way for more efficient manufacturing across product categories. That said, the increasing influence of technology has also enhanced the risk of cybersecurity challenges for the manufacturing sector. According to the research jointly conducted by the Manufacturers Alliance for Productivity and Innovation (MAPI) and Deloitte, most smart factories today face heightened threats of cybersecurity attacks. In fact, cyberattacks are increasingly becoming the most prevalent form of security breaches in the sector and disrupting its efficiency by exposing people, technology, tools, and Intellectual Property Rights (IPR) to malicious actors.

The most concerning element of cybersecurity attacks is their damaging impact on the entire value chain of manufacturing firms. From functional procedures to operating mechanisms and strategic initiatives to meeting compliance requirements, cyberattacks can disrupt a wide range of activities along with bringing the entire production operation to a grinding halt.

Cybersecurity threats in manufacturing

a) Controlling Systems and Operational Technologies: Amidst

the growing number of cyberattacks, a majority of manufacturing firms are witnessing breaches in the control systems of their production units. As controller modules are critical for ensuring desired levels of production, cybercriminals are increasingly targeting these systems to disrupt manufacturing operations. A typical control system in a manufacturing organisation consists of a combination of hardware and software components.

For example, the programmable logic controllers and IoT devices working in tandem to give/take inputs for many production variables are examples of control units. These variables, in turn, enable production operations and collectively make up a network of Operational Technologies (OT) in the firm. Any disruption in OT can significantly damage the efficiency of the entire manufacturing unit, and these OT systems have become a favorite target for cybercriminals. By executing cyberattacks on control systems and OT, hackers can easily take control of the entire production operation and significantly damage the output prospects of the company.

b) Remote Operations: Thanks to the increased use of sensors, IoT devices, and connected networks, a variety of manufacturing operations today can be easily conducted in a partially or fully remote manner. Further, aggregator platforms have also made it possible to track, analyse, and control production variables on a real-time basis. While all these connected systems have significantly enhanced production capabilities, they have also aggravated the vulnerabilities associated with possible cyber-attacks. What further increases the perceived threat of these remote operations is their accessibility to a wider network of stakeholders, including the firm's suppliers, vendors, and logistical partners, among others.

Areas of potential vulnerabilities

Different OT and IT tracks: Experts pinpoint the lack of effective convergence between OT and IT technologies in manufacturing units as one of the critical loopholes that cybercriminals are exploiting to break into production systems and disrupt the output of the company. Both the OT and IT ecosystems consist of a combination of soft and hard infrastructure, and ideally, both of these areas should converge to offer optimum results to company.

However, the OT units of most smart production houses are completely out of sync with their central IT systems. This incoherence leaves a glaring void that can be easily exploited by threat actors and lead to serious consequences for the manufacturing unit. The reason behind this divergence is the lack of centralised decision-making related to investment in OT and IT systems. While managers from shop floors primarily decide the overall framework of OT systems, the IT system in a company is conceptualised principally by corporate leaders. This often leads to the use of different controlling and safety technologies in OT and IT systems, which ultimately become one of the potential loopholes for cybercriminals.

Legacy systems: Despite the rapid rise in technology, the manufacturing industry continues to use legacy systems that are incompatible with the safety and security protocols of new production technology. These old systems are still operational in many firms and carry heightened risk profiles as compared to modern-day tools and machines. As companies have invested a lot in these legacy systems and networks, changing them overnight or upgrading them to successfully meet the cybersecurity challenges is quite a difficult task. Further, the top management and shareholders must be convinced about changing these systems, which means entirely replacing these old guards becomes a time-consuming process.

Outdated infrastructure: Just like the old hardware, the software infrastructure of many manufacturing firms is still running on older versions of apps, programs, and software. Manufacturing first needs to understand that every component in its OT and IT infrastructure should run on updated software to offer better protection against cyberattacks. All this means the deployment of the latest communication protocols, the adoption of upgraded safety procedures, and the use of secure network infrastructure in manufacturing operations should become a norm rather than an exception. Unfortunately, companies become tight-fisted when it comes to upgrading their IT infrastructure, even as they are enthusiastic about investing millions of dollars in purchasing machinery, tools, and allied hardware to increase their production capabilities and efficiencies. They need to realise that in the absence of the latest technology infrastructure, all their investments in hardware will remain at the peril of cyberattacks.

Environmental constraints: The fast-changing nature of the business environment is also putting a variety of constraints on firms shoring up the cybersecurity of their manufacturing operations. These constraints relate to both internal and external components of the environment. Internal lacking might appear in terms of not having the expertise to upgrade manufacturing processes, tools, and procedures to desired safety norms, and external exigencies such as ramping up production to meet elevated demand can sabotage the cybersecurity efforts of the company. Sometimes, Intellectual Property Rights (IPR) also get in the way of achieving the desired level of cyber safety for the manufacturing units.

An ideal cybersecurity policy should extend beyond the business and cover all stakeholders

Methods to tackle cybersecurity challenges

The need to have a holistic cybersecurity policy for the manufacturing sector couldn't be overemphasised today. Specifically, in the backdrop of increasing initiatives centered around smart factories, the risks, and challenges related to cyberattacks will only expand in the future. As the current proliferation rate indicates, both OT and IT are at risk of cyberattacks, and manufacturing organisations need to pay special attention to protecting the expansion of their digital footprint. Firms should not limit their efforts in developing an effective cybersecurity policy within the company. Rather, an ideal cybersecurity policy should extend beyond the business and cover suppliers, partners, and other stakeholders in the business ecosystem. Further, the focus of the policy must be to identify, discover, and protect the manufacturing operations from all current as well as potential cyber threats in the future. By following the given guidelines below, the manufacturing sector can protect itself from the potential threats and vulnerabilities of cyberattacks:

Assessing current capabilities: The first logical step for securing the manufacturing systems from cyberattacks is to carry out a comprehensive evaluation of the current capabilities of the organisation. This entails a thorough review of OT and IT systems and ascertaining the exact level of security that the currently employed systems can offer to the manufacturing units. The depth and comprehensibility of this evaluation will set the tone for the next step, wherein formal guidelines and frameworks for cybersecurity systems are developed for enterprise-wide implementation.

Establish a governance framework: An OT-dedicated team should be formed at the corporate level that works in close coordination with IT experts to establish a governance framework for ensuring the cybersecurity of manufacturing operations. The team should also work to achieve coherence between the OT and IT policies of the company. The focus of this framework should also be to achieve synergy so that the best results can be achieved through the unison of both of these important areas concerned with the cybersecurity of the firm.

Prioritise risk profiles and strategise action: After establishing the governance framework, the OT team must focus on safeguarding areas that are potentially at higher risk than others. Take, for instance, the operations of Computer Numerical Control (CNC) machines or Programmable Logic Controllers (PLC). Both constitute an important part of the manufacturing process and carry high-risk profiles compared to other operations like robotics or 3D Printing. Hence, it's the responsibility of the concerned teams to identify the areas of safety priority and give precedence over those that are less prone to cyberattacks.

Integrate security: For new smart manufacturing facilities in the offing, it is recommended to integrate security measures while devising processes and procedures for manufacturing operations. If manufacturing companies start incorporating cybersecurity measures right from the outset, these units will face cybersecurity challenges with aplomb. For example, firms can decide to integrate secure networking models, safe remote access, and safe networking solutions as integral parts of the project. Further, protocols related to the potential breakdown of a system and recovery mechanism should also be figured out as part of safety guidelines to offer safe and secure production operations.

In the fast-changing landscape, there is an urgent need to adopt a holistic cybersecurity framework for companies operating in the manufacturing sector. What makes this need even more compelling is the fact that the entire investment in the hardware infrastructure will become unproductive if the cybersecurity capabilities of the organisation fail to avert the cyberattacks. Experts believe that investment in OT infrastructure should take precedence over the money that manufacturing organisations are willing to spend to acquire state-of-the-art production technology. In sum, manufacturing firms must invest optimally in both soft and hard infrastructure so that optimal benefits can be realised for better margins and enhanced profitability. □

Images courtesy: shutterstock

Keys to sustaining momentum in Indian manufacturing

This column explains the requisites to enhance the Indian manufacturing capacity.

Prasanth Sakhamuri,
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Hind High Vacuum Co (HHV)

Manufacturing has long been a foundational part of the global economy and a leader in technological innovation. In a world dominated by a focus on the fourth Industrial Revolution, and what has been called Industry 4.0, manufacturers have increasingly adopted Robotics, Artificial Intelligence, Machine Learning, and Advanced Analytics.

Developing manufacturing capacity in India

After being announced in October 2020, the 'Make in India' program has started to see immediate success in the fields of electronics, defence sub-assemblies, and the manufacturing of intermediaries for pharmaceutical verticals. To sustain this initial success, these sectors have been prioritised as they are responsible for the largest number of imports into the country. The 'Make in India' initiative is the start of a whole new programme to develop significant manufacturing capability within the country. The holistic goal is to increase the contribution of the manufacturing sector from 16–17% of GDP to 30–35%.

Policies have been modified to ensure import tariff hikes, like in the case of the solar industry, and in some cases, under a defined PLI scheme, subsidies are being provided to induce manufacturers into the country and make them competitive. Growth of these sectors, with the support of the government, along with the appropriate policy and infrastructure, is required in large doses. Indian manufacturing competitiveness will further improve with trained manpower and with strong policies that will enhance the productivity of the existing workforce.

Developing manufacturing capacity for efficient production

To enhance manufacturing capabilities, the competencies will have to start at the grassroots level, which will be people, materials, core machinery, and process development. All these activities cannot be installed and established in a day. It will have to be established over a period of time, but with clear objectives and defined time frames.

Indian manufacturing landscape

Post-COVID, many international organisations looked for alternatives to China. While India has a large population, there is a huge deficit in trained manpower and effective skilling programs. According to the Economic Survey of 2016–17, the manufacturing of low-cost goods (shoes, clothes, etc.) has been moving out of China for half a decade to countries like Sri Lanka, Vietnam, and Bangladesh. When comparing the competitiveness of Vietnam and Bangladesh to Indian manufacturing, it needs to be understood that in the high technology space, India has an advantage due to large investments made in the engineering and scientific education and research institutions in the country.

However, when it comes to low-cost manufacturing, which requires high productivity and a disciplined workforce, India continues to lag because the population is highly unskilled and labour costs in India are comparatively higher in comparison to neighbours like Vietnam and Bangladesh. It will be quite a while before we can get competitive, and this can be achieved only with government policy support and infrastructure support, mainly in the areas of skill development. We need to have laws and rules that are adaptable to employing large volumes of people, and there should be a clear trust between government and industry.

Skill upgradation of human resources

India's large and young population will need to be educated, clothed, and fed. This will need to be done not through the government but by the sectors that build the economy like agriculture, services, and manufacturing. The manufacturing sector is currently the smallest (16 to 17%) and will be the one that has to grow very aggressively to build the capacity to employ people and build skills. To improve skills and make the MSME segment in India competitive, it is important that they start working in consortiums, and have coordination committees, which will be able to optimise and pool the strengths of member companies together and develop scale. Consortium work will also help in sharing skills and building capability.

The initial aspects of upskilling the capabilities of human resources could start with some education processes and skill development programs, which have started in bits and pieces across the country but would need strong involvement from the manufacturing sector to take them forward.

India is predominantly built up of small and medium-scale manufacturing companies, which are the backbone of the Indian economy. These organisations must be supported to improve their skill levels and make them more competitive. The skill development programmes that are being instituted must be integrated into the manufacturing sector to make the programme more effective and useful. The same Indian small and medium manufacturing enterprises are also noncompetitive on an international platform due to the sheer lack of economic manufacturing scale. Consolidation and helping this sector of industry scale up with the required financial support and employment policies will have to be a defined programme for the government to come up with and implement with conviction.

Ensuring higher productivity levels

In the manufacturing sector currently, gender bias is strong. Taking the example of China, we could see that gender distribution has been able to ensure significant

Gender distribution among the manufacturing sector in India

productivity and enhance household incomes. In many areas of manufacturing, the female workforce will ensure similar or higher levels of productivity. This can be achieved by amending the social outlook with good security and protection and by passing proper legislation to ensure that people can work longer hours. Automation will also help MSMEs become more flexible and manufacture products with the required qualities to do business internationally. In addition, MSMEs working in consortiums will be able to provide holistic solutions rather than partial products, making them more competitive and productive.

Financing will continue to be a major issue as the Indian banking system is aggressively focused on securities and collateral for small lending. These loans and funding to MSME consortiums should be guaranteed by the government, like what was done during the COVID revival, to help modernise and install more automation. The availability of low-cost and speedy access to funds will go a long way in ensuring that MSMEs become competitive and innovative to scale up their manufacturing facilities and make them competitive.

Meeting demands with Indian infrastructure

Post-COVID, demand has increased very aggressively for Indian companies. In the present political climate across the world, India enjoys a unique geopolitical situation. It is looked at as an alternate manufacturing base to China, if not on the same scale, at least as an alternative.

Ongoing world events have disrupted supply chains, making it difficult to get things going smoothly in the short run. Raw materials for many core technologies are not available in the country. As a program, it will need to ensure the development of critical and specialty materials like silicon, ophthalmic glass, or specialty refractory materials like molybdenum, tungsten, etc. This will have to be a very aggressive programme to make the country self-sufficient in all strategic materials. However, in the short run, smart buying is the key to lower-cost input materials, especially for companies engaged in exports.

A collective programme to ensure proper buying or concessions for a certain product to be imported if they are not available within the country should be done to make manufacturing and exporting effective. The disruption of the supply chain is prevalent across the world and is not just limited to India. It is important at such times to be transparent and open about the challenges being faced and work towards finding alternative materials and supplies to keep pace with the demand.

When international companies are expected to manufacture in India, sufficient laws for IP protection must be in place to ensure that there is a free flow of technology and knowledge into the existing manufacturing infrastructure. This will ensure that there is a proper value for the IP that is generated and will create an incentive for people who generate IP to come to India for manufacturing.

Way forward…

To maintain competitiveness, India must ensure that no wasteful expenditure occurs and that raw materials are properly utilized. MSMEs and other industries should automate and be analytical to ensure inventory is optimised and continuous innovation is in place for cost reduction and being competitive. Consortium working of smaller companies to provide total solutions to customers would also go a long way in pooling together entrepreneur resources.

Overall, the future of Indian manufacturing is highly positive, we have a large workforce that, once we develop skills, will be highly capable. We have a young population that can work hard and be trained to have the right capability. Indian manufacturing should adapt to produce volumes and set up large factories. □

Re-shaping manufacturing with analytics

With the help of the right analytics, manufacturers can closely monitor supply chains in exact detail and aim at modifying every section of the production process. This capability lets manufacturers identify production bottlenecks and reveal underperforming components throughout the entire process. Therefore, manufacturers can spot their dependencies and generate an alternative plan to strengthen production processes and eliminate potential pitfalls.

Ali Hyder,
Group CEO,
Focus Softnet

Efficiency, productivity, and profitability have been the quintessential mantras for manufacturing industries. We have collectively worked for centuries, beginning with the first Industrial Revolution, to optimise these three critical factors. With the onset of Industrial Revolution 4.0, we can fairly say that we are optimising efficiency, performance, productivity, and, ultimately, profitability like never before. We have incorporated some of the most in-demand technologies, like Artificial Intelligence (AI), Machine Learning (ML), Data Science, Industrial Internet of Things (IIoT), Cloud Computing, and more, into our manufacturing processes & workflows for precision outcomes and reduced overhead expenses. We even have real-world examples. A France-based food producing company, Danone Group, shared that with the implementation of Machine Learning, they were able to reduce forecasting errors by 40%, reduce lost sales by 30%, and decrease the workload of demand planners by around 50%. Not just this, even our very own 184-year-old FMCG giant, Procter & Gamble Co, is taking the smart manufacturing route by implementing advanced algorithms, predictive analytics, and IoT in its paper towel manufacturing division. While this is happening across manufacturing companies at scale, there is still a haze around the benefits of AI in digital manufacturing and how it has been key in driving the transformation from conventional manufacturing to digital.

Digitalisation in manufacturing

As the manufacturing industry undergoes a digital transformation, devices are connected to reduce the labour associated with manual documentation. Automated machine data collection mechanisms are propelling the next generation of

manufacturing analytics to unlock the most accurate forecast basis based on a plethora of advanced use cases ranging from straightforward monitoring and diagnostics to Predictive Maintenance and the aftermath of automation. In the new generation of manufacturing analytics, data that records events can be utilised to enhance equipment performance, drive process improvement, save costs on production, and minimise human errors. The tool provides reliable information that reveals accurate equipment conditions and trends in production.

Types of marketing analytics

Manufacturing analytics is a collection of different processes that bring businesses insights, they can leverage to implement data-driven decisions. Here are the four types of marketing analytics that marketing businesses can apply to their company's pipeline:

Descriptive analytics

It is the simplest type of data analytics that focuses on the most fundamental aspects of your business. This is available in the ERP dashboards and reports and informs users about what has happened or is currently happening. Manufacturing businesses can benefit significantly from descriptive analytics. It does not necessitate a thorough understanding of analytical or statistical methods and can be carried out easily using readily available tools. Descriptive analytics reports can answer common business performance-related questions concerning the expectations of achieving sales and other business goals. It is the most basic form of data analytics but can still assist users in identifying trends and developing strategies based on real-time insights. Descriptive analytics lays the foundation for all manufacturing insights.

Diagnostic analytics

It aids in determining the root causes of organisational problems. It is about breaking down available business data to determine the grounds for an issue, event, and behavior. This is done following popular techniques, including drill-down, data discovery, data mining, and correlations. Manufacturers can leverage diagnostic analytics data to spot the root causes of their production inefficiencies, shipment delays, inventory shortages, or any other issue in advance to understand why the event has occurred and avoid future mishaps. Like descriptive analytics, diagnostic analytics relies on historical data but seeks to identify and explain anomalies and outliers.

Predictive analytics

The predictive approach to manufacturing analytics leverages descriptive and diagnostic analytics data to help manufacturers forecast what might happen next in their business. It mines historical data sets to evaluate the potential risk and identify the most likely future trends to help companies develop the right strategies. Improving efficiency across the manufacturing plant is the most significant benefit of any predictive analytics tool. The idea is to learn from experience and find the perfect approach to creating a better future.

Prescriptive analytics

This includes observing historical data, predicting outcomes, and, based on that, suggesting a course of action. It is considered the highest level of an optimal manufacturing analytics solution, assisting organisations in overcoming future challenges. Manufacturers can see which processes need improvements and how they could immediately impact their bottom lines. Prescriptive analytics encompasses the most advanced techniques, such as simulation, optimisation, and machine learning. These can tackle highly complex problems with numerous constraints and variables that could never be analysed manually. Decision optimisation benefits manufacturers by getting the most out of decision value in production planning, resource management, scheduling, maintenance, and all other aspects of the business.

Industry benefits

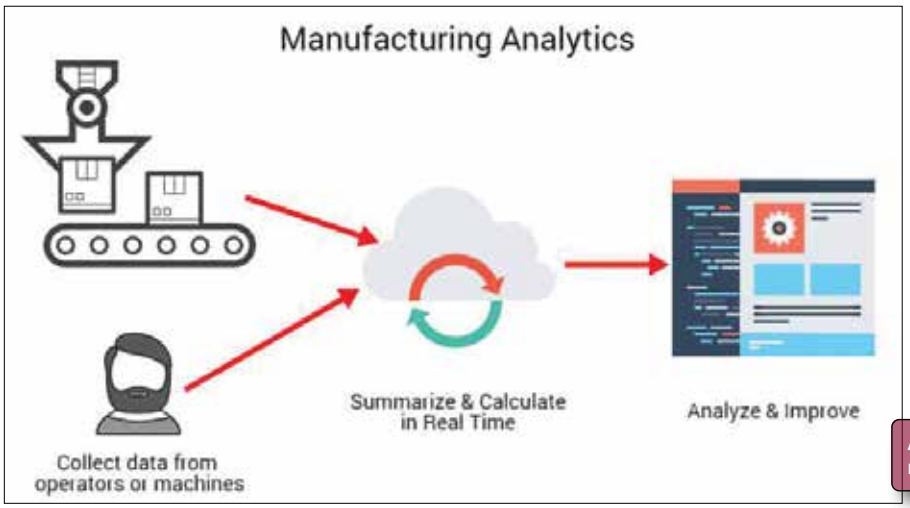
Contextual awareness is critical for modern manufacturing businesses. Manufacturing analytics makes companies more competitive in terms of cost, quality, and customer experience. With the help of real-time manufacturing analytics and intuitive visualisation tools, companies could leverage data to improve their productivity and profitability.

Here are the distinct benefits of manufacturing analytics:

Lower operating costs: Manufacturing analytics lets manufacturers generate records to instantly gain insights for handling ad hoc queries. This is a visualisation model with easy-to-read data that could help manufacturers optimise their operating costs and eliminate unnecessary spending

Increase asset performance and productivity: Profit in the manufacturing industry relies heavily on maximising the value of assets. An increase in performance can significantly enhance productivity, even if it is only on the margins

Similarly, lowering asset breakdowns can reduce inefficiencies and losses due to them. For these purposes, manufacturers must constantly optimise and maintain asset performance. Data analytics can help manufacturing businesses capture and interpret machine data to reveal accurate insights that can help improve their asset performance and drive predictive maintenance. This



A diagram showing manufacturing analytics

prevents untimely asset breakdowns and unexpected downtime, which improves asset performance and increases production.

Making product customisation possible

In the past, the manufacturing industry focused on production at range and only allowed customisation of their products for enterprises serving niche markets. They prefer to avoid customising products for a smaller group of customers due to the fear of investing enormous time and effort in fulfilling those requests. Data analytics is evolving this behaviour by making it possible to predict demand for customised products accurately. ERP software with innovative data analytics tools can identify changes in customer behavior, making it possible for manufacturers to efficiently produce customised products as they manufacture goods on a larger scale. When manufacturers are endowed with the right tools, they can dive deep into the process and successfully facilitate customisation using in-house capabilities before completing the manufacturing process.

Optimising supply chains & production processes

Supply chains and manufacturing processes have become deep and complicated in today's global and interconnected environment. Businesses need to analyse every component of the supply chain and manufacturing activities in detail to ensure their efforts to modernise and optimise these supply chains and production processes are thoroughly maintained. Data analytics provide this capability.

Steps to success in manufacturing data analytics

1. Make sure to capture data from the right source: Manufacturers who want to solve a specific problem require relevant data. Attempting to solve the problem without the necessary data will only result in frustration for the person involved. So, the first step in marketing analytics is to ensure that data is captured from the right source. Begin by determining the requirements and building a catalogue of your data resources for success in manufacturing analytics
2. Make sure to capture useful data: When the data quality is different from what is needed to execute the project successfully, it typically leads to problems of insufficient data granularity to draw accurate conclusions. To make matters worse, many manufacturers lack standard operating procedures and are unable to generate data that is consistent enough to be valid, making analysis difficult or impossible. Unfortunately, this issue becomes apparent only after the project is well underway. So, it is critical to include project milestones for teams to discuss the suitability of the data collected for analysing a problem before the project initiates
3. Stay away from manual data preparation: According to data scientists, they spend 80% of their time cleaning and blending data, and only 20% is spent performing analyses and developing insights. This is unacceptable at a time when manufacturers need to incorporate data-driven decisions to ensure their operational processes continue to accelerate, making it critical for modern manufacturers to invest in tools that can automate data cleaning and blending activities
4. Focus on building out a data platform first: Taking a deep dive into business data can assist manufacturers in uncovering ways to achieve profit growth. Manufacturers must ensure that the data models are generalisable and adaptable to address multiple use cases and extend capabilities throughout the enterprise
5. Ensure the results are actionable: Results need to be actionable, which means insights must be presented in a way that allows manufacturers to leverage the data to drive informed business decisions. To ensure this happens, it is critical to accurately incorporate proper context in a location that users can easily view. In the absence of this, efforts will fail, as no one can understand the report and, therefore, be able to drive the opportunities for operational success. □

Transforming manufacturing for a better tomorrow

With a total footfall of around 96,000 visitors, IMTEX 2023 witnessed 991 exhibitors and participation from 23 countries with five country pavilions. Team EM was a part of the six-day show, and here we bring to you the post-event report…

Neha Basudkar Ghate
Assistant Editor
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Organised by the Indian Machine Tool Manufacturers' Association (IMTMA), IMTEX 2023, Tooltech 2023, and Digital Manufacturing 2023 were hosted from January 19–25 at the Bangalore International Exhibition Centre (BIEC), Bengaluru. The 20th edition of IMTEX received an overwhelming response, as progress was made in India's manufacturing industry, the six-day exhibition showcased next-generation technologies to learn more about cutting-edge technology, innovative solutions, and the latest advancements in digital manufacturing technology.

Inauguration and keynote

Inaugurated by Kamal Bali, President & Managing Director, Volvo India Group, and Gopal Subramanyam, Chairman, SKF India, the inauguration saw a positive response in the manufacturing space. Jamshyd N. Godrej, Chairman, Exhibitions, IMTMA; Ravi Raghavan, President, IMTMA; Rajendra S. Rajamane, Vice President, IMTMA; Jibak Dasgupta, Director General & CEO, IMTMA; and Shailesh Sheth, Chairman, Media, Programs Committee,

IMTMA were also present at the inauguration.

Delivering the welcome address, Godrej said, "Although the pandemic put a strain on businesses, the exhibition industry is back. IMTMA completed 75 years journey and will continue to support the machine tool and manufacturing industries, while BIEC will support exhibitions, investor conferences, and corporate events." He further added, "The types of machines that are made worldwide are specialised machines, and it's not possible for any country to make everything on its own, so I think this expectation that everything should be available in India is not right. We have a healthy amount of imports, but at the same time, we should manufacture and develop whatever is possible from the country."

Overviewing the manufacturing space

Giving a broader perspective of the manufacturing industry, Bali stated in his address that manufacturing is the future growth story of India, and IMTEX is a great platform. "The next decade belongs to India, which is fuelled by forward-looking policies, young and emerging talent, and global investments and is slated to do well," he added. Speaking about India's journey in the current situation, Raghavan shared, "India continued to remain resilient in the wake of the ongoing geo-political situation, talks of stagflation, and an anticipated slowdown. This edition of IMTEX is a testimony to it, as IMTEX 2023 received significantly favourable responses from national and international exhibitors."

Stating the importance of the Indian manufacturing industry's focus on providing a solution, Sheth said, "The industry has witnessed huge development in new and upcoming technology, providing solutions and not just a product. Along with it, the product bandwidth has enhanced the impact on products with the launch of government initiatives like Make in India, PLI schemes, and several others," According to Dasgupta, "It's not enough to have only the physical infrastructure, we also need to have a social infrastructure. All the other necessary things, whether it is skill training, housing, or anything, the government needs to look at holistic development."

He also cited an example from Vietnam, in which all regulatory issues are handled by PATH, adding, "Vietnam has attracted many investments; they have developed a system in which all regulatory issues are handled by PATH, working alongside leaders, communities, and local changemakers to develop sustainable systems for addressing the country's shifting health challenges. People come to this facility because they do not have to deal with the hassle of dealing with government departments. Therefore, I think people need to evolve their thinking on industrial parks."

Tête-à-Têtes from the IMTEX Pavillion

Parakram Jadeja,
Chairman & MD,
Jyoti CNC Automation

"Aerospace is the most upcoming industry in India, and since the last four years, we have developed a lot of new things that we wanted to showcase to all our customers globally. This edition of the IMTEX is one of the best. There are 21 machines at the booth, which are different products that include turning, milling, multi-tasking, five-axis machines, automation, dye & mould and all sectors of manufacturing in the one-stop solution we have created. It's like a one-stop solution we have created over here."

"Aerospace is looking like a promising sector. As all of us are aware, it was the automotive sector that was driving, but now it is general engineering. There are numerous investments taking place in the energy and power sectors. Finally, from the standpoint of manufacturing, success will be defined as making the MSME successful. A lot of manufacturing in different sectors, like what happened in the auto sector, is expected to happen in the MSME sector. So, the biggest challenge, I believe it is going to be handholding and skilling the MSME sector. India is perhaps one of the few shining spots from a global perspective. We believe that more and more work is going to come from a manufacturing perspective to India."

TK Ramesh,
Managing Director,
Ace Micromatic Group

Hrishikesh Kulkarni,
Chief Operating Officer,
Zimmer Group

"The Indian market is catching up with all the latest developments, right from the manufacturing floor to the digital synopsis. Industry 4.0 was alien a decade ago for the Indian machine tool industry and the automation sector, but now it has become the way of life. There are several positive events that we can look forward to."

Tridib Majumder,
Managing Director,
Quaker Houghton

"Digital transformation is shaping India today. We have a huge amount of manpower in India; however, India lacks the competent manpower wherein Industry 4.0 can help pacify the situation and make things easier when it comes to sensor technology, measuring, controlling and optimising equipment."

Punit Gupta,
Managing Director,
Blaser Swisslube

"Every day, digitalization becomes more prevalent in our lives. Therefore, there are different digital initiatives Blaser has taken globally, as the company believes in thinking ahead of time and helping customers win. At IMTEX, we had displayed three major initiatives, including the Smart Automated Coolant Management System, the Liquid Tool Autopilot System, and Liquid Tool Guardian."

Manoj K Sundaram,
Head of Business Development,
Carl Zeiss

"The EV industry has been in the limelight for the last few years, but from the last two years, especially during COVID, it gained a lot of traction, and currently about 1 lakh EV vehicles are being manufactured. When it comes to batteries, they have recently gained some negative publicity, which is not required. Our job, however, is to make the batteries safer. Our solutions analyse the failure and support them to make safer battery packs."

Santhosh Nagaraju,
Technical Specialist,
Hexagon Manufacturing Intelligence
(HMI), Indo-Pacific Region

"Additive Manufacturing is the new trend in the market as it comes with massive advantages and challenges. The benefits include freedom to design and components that are nearly impossible to manufacture, and the challenges include domestic players, who are not enough, nor are the costs, quality, and tools."

Prashant Sardeshmukh,
Managing Director,
MMC Hardmetal India

"The automotive industry in India is growing, and the majority of the cutting tool and machine tool makers are still largely dependent on the automotive industry in India. Aerospace and medical industries are also picking up. These three industries are going to contribute heavily to India."

Keshav Khurana,
Executive Director,
Wohlhaupter India

"The industry is looking at huge demands, and therefore the industry is becoming more and more challenging, and along with it the competition is also boosting at its best. In this scenario, we have come up with a new product wherein they can virtually visit our plants worldwide. Also, we have online training. As a result, all of these solutions and products make our customers happier and more inclined to embrace the innovations that we are introducing."

Dave Moskey,
Territory Manager India,
SE Asia and The Middle East,
Mastercam

"There are several challenges in manufacturing that are being met by a host of solutions. However, when it comes to Mastercam, the best part of the company is the mother software that performs operations such as metrology, robotics, Additive Manufacturing, shop connections, and Industry 4.0 and 5.0, it is a confluence of technologies in a single interface we are trying to be a base software that will help connect to all these subsystems, therefore, making the whole manufacturing process seamless."

Ulf Meyen,
Managing Director,
Oemeta India

"Oemeta is committed to meeting the UN target for carbon footprint reduction. We are not targeting only our company at reducing the carbon footprint and walking towards the sustainability path, but we are also helping our customers as well to reduce their waste, for instance, in order to reduce the consumption of mineral oil and so on."

Rajesh H,
Sales Manager,
IFM Electronic

"Since IFM caters to most types of industries, including machine tools, automotive, the food and beverage industry, and the steel industry. As a result, at IFM, we ensure that technology is accessible to everyone, as well as affordable, user-friendly, and serviceable at all times."

Dr Nagahanumaiah,
Director,
Central Manufacturing
Technology Institute

"Innovators and researchers are in a sweet spot in India. 'Atmanirbhar Bharat' has given prime importance to the nation. Along with collaborating with allied partners, the government will also focus on and encourage innovation with several initiatives and programs. One such programme is Enhancement of Capability Building in terms of capital goods, that is, equipment and machines, with government funding of ₹970 crores with 20% contribution from industry."

Soumyodeep Bhattacharya,
Chief Executive Officer,
Zavenir Daubert India

"From a demand standpoint, it is very robust, and as we transition away from the China supply chain, we are seeing that translate into tangible numbers as the year progresses. The challenge, of course, is the geopolitical situation. Some parts of our portfolio are closely linked to crude oil. Secondly, post-Corona there have been supply chain disruptions, so building alternate supply chain models to provide steady, seamless, sustainable supplies has been a challenge. However, we have come a long way from where we were."

Takashi Yamazaki,
President,
Yamazaki Mazak Corporation,
Japan

"Currently, in India, a wide range of manufacturing companies, including automobiles, agricultural machinery, and aircraft, continue to actively invest in equipment as domestic demand expands. Especially in recent years, as the supply chain of the manufacturing industry has been reviewed worldwide due to the decoupling of the United States and China, semiconductor investment in India has been active. Combined with these trends, demand for machine tools is expected to increase over the medium to long term."

John Mangus,
Asia Operating Manager,
QVI - Quality Vision International

"The Indian market is very strong, the industry is growing here, and huge numbers of automotive industries are also coming up. So, it's been a very good platform for us. Everyone had challenges in the last couple of years that hit the whole globe equally. But navigating it and solving the solution, along with leveraging themselves and keeping the industry at the top of their priority list, has shown positive results to the industry till date."

Improve shop floor productivity

Mastercam India, demonstrated a host of new features of their latest version 2023, offering expanded machining flexibility and increased emphasis on speed and automation. Multiaxis features, 3D enhancements, & 2D high-speed toolpaths combine with dozens of additional new enhancements in a software package intended to improve shop floor productivity, at IMTEX 2023, between January 19 & 25, 2023.

Expanded machining flexibility

Multiaxis Improvements

Morph, Parallel, Along Curve, and Project Curve are no longer individual toolpaths. Instead, users can now find the same functionality inside the Multiaxis Unified Toolpath, which allows for more flexibility in the cut pattern when programming multiaxis, all within a new advanced feature set and consolidated easy-to-use interface. A new Feed Rate Control page consolidates the feed rate control options, making the options easier to find and simplifying your workflow.

3D Enhancements

The Dynamic OptiRough and Area Roughing toolpaths can now be aware of undercut stock conditions, resulting in improvements to the toolpath motion, including less air cutting. Equal Scallop is now a fully stock-aware, semi-finishing toolpath that now identifies material left in corners and will machine with a single pass or with multiple passes to ease into the material. With the new linking parameters in OptiRough toolpaths, you can control and optimise your air cuts, which allows for greater efficiency in roughing toolpaths when transitioning between passes or in air.

2D Enhancements

The Slot Mill toolpath no longer requires two parallel walls when selecting the machining geometry. Customers will be able to select any closed chain. 2D Contour Profile Ramp now supports the Override feed rate option, which allows you to specify a feed, allowing to slow down feed rates as you are engaging material. When items are dragged and dropped in the Toolpath Hole Definition panel, Mastercam now provides visual cues for the drop location. Also, the drag-and-drop icon now indicates whether you are dragging a single item or multiple items.

Improvements to the Mastercam milling module that improve efficiency include:

- The Tool page and Toolpath parameters tab for milling toolpaths have been redesigned to provide a better, more user-friendly layout.
- Automatically Detecting and Including Stock for Z depths is now included for 3D high-speed toolpaths.

Mastercam India | Pune

Versatile and easy-to-deploy automation solutions

Universal Robots, showcased cobots for diverse industry applications and scenarios, at the Indian Machine Tool Expo 2023 (IMTEX). The company demonstrated cobots completing tasks commonly required in manufacturing and assembly environments, and solutions for evolving business needs in India. The solutions are:

UR3e: Carrying a payload of up to 3 kg and with a small footprint of only 128 mm, the compact UR3e is ideal for tight workplaces such as benchtops or inside machinery for light assembly applications. At the event, UR3e was fitted with vision capabilities to demonstrate pick and place tasks, where sorting a variety of objects and their orientation is important.

Lightweight and adaptable cobot

- **UR5e:** The UR5e is a lightweight and adaptable cobot, with a payload of 5 kg, that can tackle medium-duty applications with ultimate flexibility. At the event, UR5e was fitted with a screw-driving end-effector, which covers the process from screw pick up to insertion, since screw driving is a common process task. With this extension, a cobot can insert six screws in less than a minute, even in narrow and hard-to-reach spaces. It can also automatically detect missing screws, and communicate the status of the screw insertion with human co-workers, through visual and audible signals, for reliable, flexible, and safe operations.
- **UR10e:** The UR10e is versatile, with a payload of up to 12.5 kg, a long reach of 1,300 mm, and a 6-axis robot arm, well suited for a wide range of repetitive applications. UR showcased how UR10e was fitted with a gripper to automate material handling tasks, relieving workers from repetitive work and heavy lifting.
- **UR16e:** The UR16e handles an exceptional payload of 16 kg, making it especially useful for carrying heavy arm tooling and can lift multiple parts in a single pick, achieving higher efficiency by reducing cycle times. At IMTEX, UR16e demonstrated how the cobot can accomplish the job of machine tending at a level of performance comparable to a human worker.

Commenting on the expo, Sougandh K.M., Country Manager, India, Universal Robots, said, "India's automation industry is advancing as it moves towards being a key global manufacturing centre in the upcoming years. Cobots are ideally suited for automating monotonous and boring jobs, particularly for pick-and-place, deburring, screw driving, and machine tending applications.

Universal Robots | Bangalore

Contactless changeover valves

Dürr has developed a new generation of pneumatic vertical piston pumps that increases process reliability yet requires much less maintenance. The EcoPump2 VP is designed for various media typically found in industry and can be used in many fields such as mechanical engineering, metal working and woodworking, or the furniture industry. The new pump only needs one seal for the majority of applications, which is also much quicker and easier to change than on the predecessor model. The fluid parts can be disconnected from the air motor with conventional tools via a quick coupling. The new air motor can be operated without any oil. This significantly reduces the maintenance required, including in comparison with the competition. A further benefit is that the contactless changeover valves used to regulate the air motor changeover guarantee higher process reliability. With five different versions of the EcoPump2 VP covering a pressure range from 22 to 306 bar, the pump is suitable for applying paints, high-viscosity materials, and adhesives to furniture, steel constructions, and many more materials.

Pneumatic vertical piston pumps

Dürr India | Chennai

High-performance solutions

Grindwell Norton Abrasives, showcased advanced engineered, high-performance solutions at the recently concluded IMTEX 2023. Themed around 'Technovation' (an amalgamation of technology and innovation), Norton at IMTEX showcased the brand's technology and innovation prowess and highlighted its capabilities in offering products and solutions that are unique to the industry. At IMTEX 2023, the company revealed IIoT solutions such as Norton Band, a smart wearable device that pairs with grinding power tools to help perform grinding safely, smoothly & smartly by visualising data on various operational and human-centric safety parameters. PGS (Performance Grinding Solutions) digital-based services that facilitate a better understanding of automated grinding with process monitoring and optimization for overall productivity improvement were also introduced. Hari Singudasu, Vice President, Grindwell Norton India, said, "We are showcasing our capabilities to provide the complete range of innovative grinding, finishing, and polishing solutions to the existing as well as emerging industry segments, both in terms of products as well as services." These technologies will make it easier to assist leading industries in enhancing performance and modernising production systems for the future.

High performance solutions

Grindwell Norton India | Bangalore

High-quality, anti-corrosion and wear-resistant hard material coating

JUNKER develops an innovative and unique process for manufacturing hard-coated brake discs. With the hard material coating of brake discs, a series of processes for conventional cast-iron brake discs will be available in the future, which will enable a reduction in fine dust emissions caused by braking. New coating processes give brake discs a high-quality anti-corrosion and wear-resistant hard material coating. By optimally adjusting the layer system, in combination with the brake pads, an optimal friction pairing can be achieved in terms of braking properties and minimal fine dust emissions. JUNKER offers decisive impetus with its ground breaking process in the field of coating and grinding brake discs. After coating, the brake disc is processed simultaneously on its parallel sides with two grinding discs opposite each other in the highly productive grinding process. With the innovative manufacturing process, perfect parallelism and exact axial run-out are achieved, and the thickness deviation (DTV) is reduced to a minimum.

Hard coated barkes discs

Erwin Junker Maschinenfabrik GmbH | Pune

Technological advancements & innovative CNC solutions

Mitsubishi Electric India displayed its technological advancements and innovative CNC solutions for Machine Tool Industry at IMTEX-2023. Solutions including, Mitsubishi Electric- M80V, the evolution in smart manufacturing, which provides high productivity and easy operability, Mitsubishi Electric- Drive Units MDS-E Series, MDS-EM Series, & MDS-EJ Series as high-gain servo/spindle drives with the capability of fully enhancing drive system performance, Mitsubishi Electric- Servo Motor Units HG Series as Nano-control compatible servo motors that boost smooth rotation and outstanding acceleration capabilities, well suited to various types of machines, Mitsubishi Electric- Spindle Motors equipped with high speed and efficiency. Addressing the event, Masaya Takeda, General Manager, CNC Systems, Mitsubishi Electric India, said, "This has been a great platform to cater to the requirements and advancements in the metal cutting industry and to extend our strong support towards the Skill India Mission through our sustainable machining and reliable CNC solutions." The latest products introduced by Mitsubishi Electric- CNC that is, M80V & M800V and their variants were exhibited to experience the application and robust working of this recently launched product.

Mitsubishi Electric India

Mitsubishi Electric India | Haryana

Highlights – March 2023

» **Aerospace & Defence Manufacturing**
The aerospace and defence manufacturing industry is known for its high technology and complex processes, and it requires a significant amount of investment in research and development, engineering, and testing. The industry involves the production of a wide range of products and components, including commercial and military aircraft, helicopters, missiles, satellites, and space vehicles. This segment will elaborate on the aerospace and defence manufacturing industrial processes, and talk about the challenges in the industry, including stringent regulations, rapid advances in technology, and the need for high levels of precision and quality.

» **Titanium Machining**
Titanium machining refers to the process of cutting, shaping, and finishing titanium and titanium alloys into the desired form. This process is typically carried out using a variety of machining tools and techniques, including turning, milling, drilling, and grinding. The segment will talk about the qualities of the titanium materials benefiting high-speed machining processes and its uses for coatings on cutting tools, improving cutting performance and reducing tool wear.

» **MRO Technologies**
MRO (Maintenance, Repair, and Overhaul) technologies refer to the tools, techniques, and processes used to maintain, repair, and overhaul a wide range of equipment and assets, including aircraft, vehicles, machinery, and other complex systems. MRO is a critical component of the aerospace, defence, and manufacturing industries, as it helps to ensure that equipment and assets remain in good condition and are available for use when needed. The segment throws light on widely available MRO technology tools including predictive maintenance, condition-based monitoring, and asset management systems.

» **Drones in Manufacturing**
Drones, also known as Unmanned Aerial Vehicles (UAVs), are increasingly being used in the manufacturing industry to improve efficiency, reduce costs, and increase productivity. One of the most common applications of drones in manufacturing is for inspection and maintenance. Drones equipped with cameras, sensors, and other specialised equipment can be used to inspect hard-to-reach areas, such as the interiors of large storage tanks or the roofs of industrial buildings, without putting workers in harm's way. The segment will discuss the advantages of drone usage in the manufacturing industry to enhance efficiency and save time.

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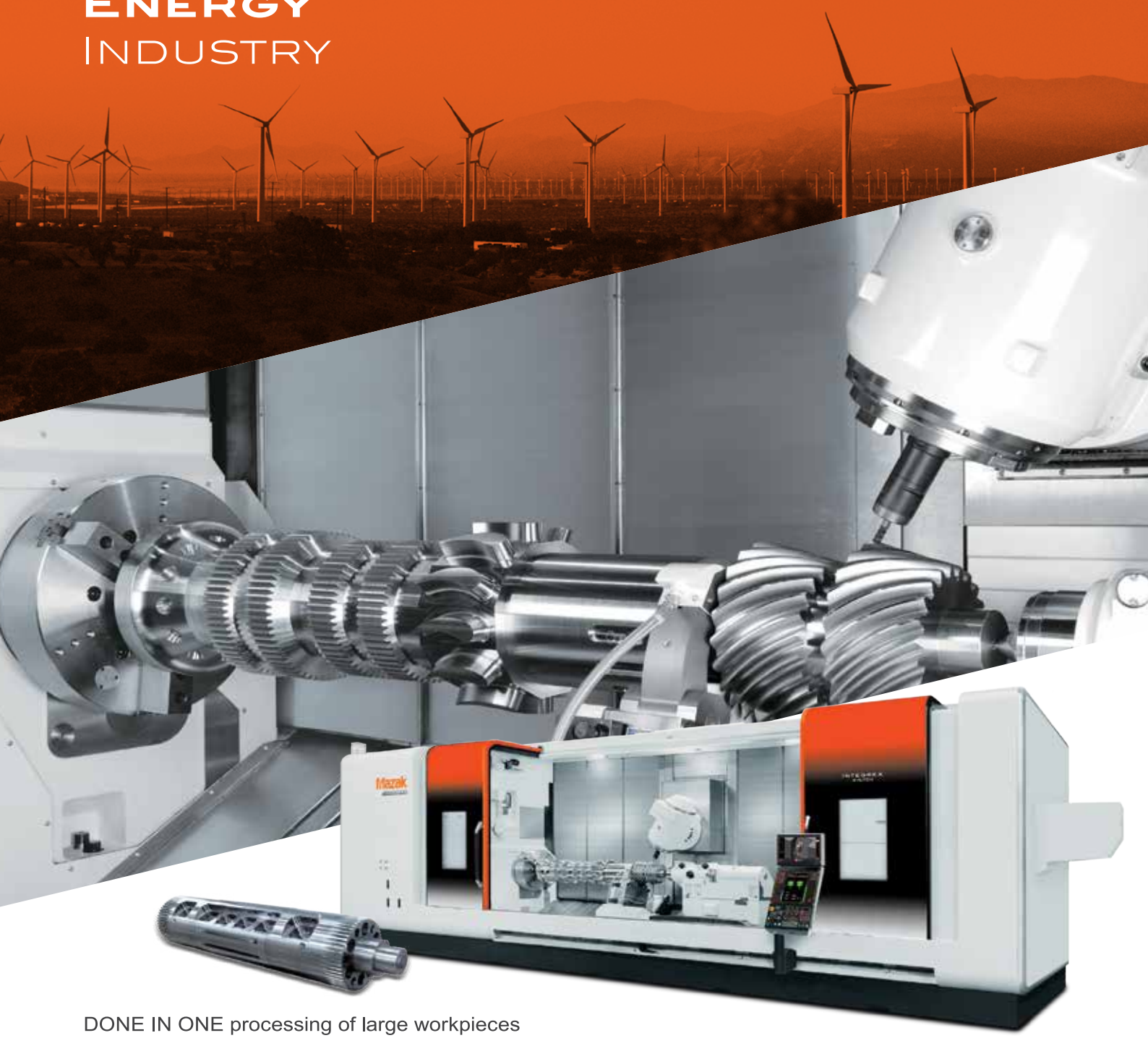

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