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ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

THE MACHINIST

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INDIA PLANT

Yamazaki Mazak, a global leading company of machine tool ,
will open a new plant in Pune.

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Mazak

INDIA PLANT

PLOT NO. A-100 MIDC, RANJANGAON INDUSTRIAL AREA, VILLAGE KAREGAON, TALUKA SHIRUR, PUNE, MAHARASHTRA, 412220

Yamazaki Mazak has a long history of localized sales and service activities in India since 1998. Today, Yamazaki Mazak has six support locations, providing solutions for a variety of industries.

The new plant will provide products that meet the needs of Indian customers and contribute to the development of manufacturing in India.

INDIA PLANT COMPLETE IMAGE

INDIA PLANT PRODUCTION MODEL

BT No.40 VERTICAL MACHINING CENTER

VC-Ez 410 IP

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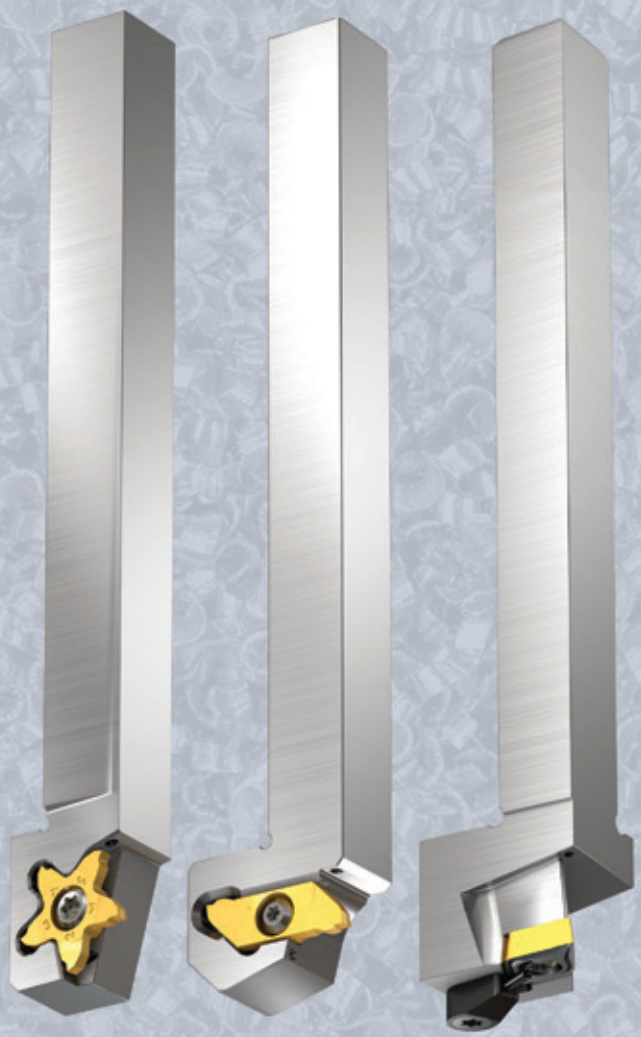

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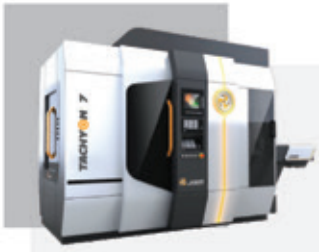
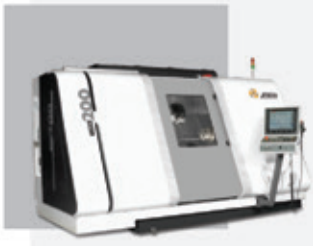


Tachyon 7
CNC High Speed Vertical Drill Tap Centre

ATM 160
CNC Inverted Vertical Spindle Turn Mill Centre



TMX 200
CNC Twin Spindle Twin Turret with Y-Axis

VTL 750
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HX Series
CNC Horizontal Machining Centre

HSX Series
CNC High Speed Horizontal Machining Centre

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SMART MATERIALS BUILDING A SMARTER WORLD

The sleek and powerful smartphones we use daily may seem like simple devices, but behind the scenes lies a world of advanced technology and engineering, particularly when it comes to the use of smart materials. While polymers, metals, ceramics and glass are key components, it's the use of piezoceramics and crystals like lead, zirconate, titanate and quartz that give smartphones their "smart" capabilities. Sensors made using these 'smart' materials allow our phones to detect motion, orientation, and position, as well as environmental factors like temperature and light.

But the fascinating world of smart materials is not limited to our smartphones.

Smart materials are gaining more attention and becoming increasingly prevalent in various industries. Advancements in materials science and engineering have led to the development of new types of smart materials that have unique properties and functionalities that can change in response to the variations in their environment, such as temperature, light, or pressure, amongst others.

With the ability to sense and respond to changes in their environment, these materials have opened up a world of endless possibilities and opportunities across various industries. From the aerospace and automotive industries to healthcare, robotics, construction, and consumer electronics, the applications of these materials are diverse and far-reaching. They have the potential to transform the way we design and build structures, machines, and devices, making them more efficient, safer, and easier to use.

Some of the other key applications of smart materials are in the field of medicine. For example, shape memory alloys can be used in medical devices such as stents and orthodontic wires. These materials can be programmed to remember a certain shape and then return to that shape when triggered by body temperature, allowing for minimally invasive procedures.

Smart materials are also being used in the aerospace industry. Materials that can change shape or stiffness in response to changes in temperature or pressure are being developed to improve aircraft performance and reduce weight. For example, morphing wings that change shape during flight can improve fuel efficiency and reduce noise.

Innovations in smart materials continue to drive the development of new applications and technologies. For example, researchers are developing smart materials that can store and release energy, which could revolutionise the way we store and use energy. Others are developing smart materials that can be used in wearable technology, such as smart fabrics that can monitor vital signs and adjust the temperature to improve comfort.

Editor

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MOLDINO Tool Engineering, Ltd.

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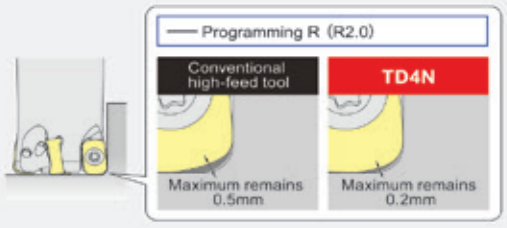
TD4N

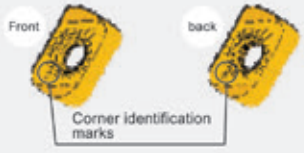
Radius mill TD4N

Reduces uncut remnants on work pieces

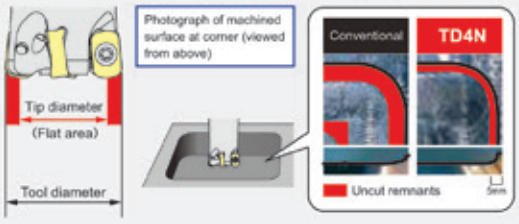
The cutting edge shape was reviewed for TD4N so that uncut remnants are reduced. This enables the load on the next process to be reduced by up to 40 compared to conventional products.



Economical 4-corner inserts with chip breakers for various applications



Large tip diameter for excellent handling



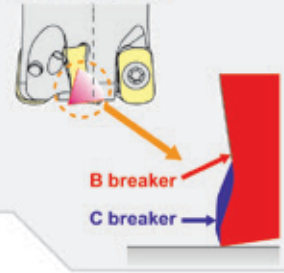
Excellent chip discharge characteristics

Crushed cutting chips

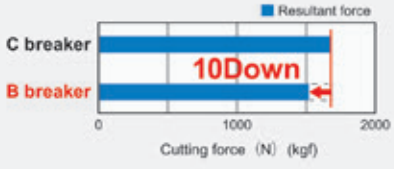
Cutting chips which were discharged well

Magnified view of cutting edge cross section

Positive rake angle



Comparison of cutting force



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YOUR GLOBAL CRAFTSMAN STUDIO

ExxonMobil to Build Lubricant Manufacturing Plant in India

EXXONMOBIL is investing nearly INR 900 crore (USD $110 million) to build a lubricant manufacturing plant at the Maharashtra Industrial Development Corporation's Isambe Industrial Area in Raigad. The company signed a Memorandum of Understanding (MoU) with the Government of Maharashtra in the presence of Chief Minister Eknath Shinde, Deputy Chief Minister Devendra Fadnavis and senior officials from the state.

Once operational, the plant will have the capacity to potentially manufacture 159,000 kiloliters of finished lubricants annually to meet growing domestic demand from industrial sectors such as manufacturing, steel, power, mining, and construction, as well as from passenger and commercial vehicle segments. It is expected to begin operations by the end of 2025.

"We are proud to deepen our longstanding commitment to India with our first greenfield investment. Maharashtra is amongst India's largest manufacturing hubs and a natural choice for our lubricant plant thanks to its attractive investment environment," said Monte Dobson, lead country manager for ExxonMobil affiliates in India.

In a significant boost to the "Make in India" initiative, the plant will source a larger part of the base stocks, additives, and all packaging locally. It is expected to create nearly 1,200 jobs during the construction phase.

Hexagon and Altium partner to improve the sustainability of the electronics industry with cloud-based digital reality solutions

HEXAGON'S MANUFACTURING INTELLIGENCE DIVISION AND ALTIUM have entered a strategic partnership which will help the design and manufacturing of electronics be more environmentally sustainable. The partnership combines Hexagon's expertise in utilising data from design and engineering, manufacturing, and metrology with Altium's strengths in PCB design and electronics supply chain intelligence to help companies understand the impact of product development decisions on the sustainability of electronics and smart products.

Nearly every industry today faces increased pressure to reduce its carbon footprint and energy consumption, improve the recyclability of products, and conform to many additional regulatory requirements. Achieving such shifts in the electronics industry is immensely challenging given the complexity of global supply chains and operations, as well as the products themselves. Almost no solutions exist to manage sustainability performance across this ecosystem. Hexagon and Altium's partnership recognises the significant impact that the electronics industry has on the environment and aims to make positive change by introducing new tools and solutions which support the industry in becoming more sustainable.

The partnership will integrate Hexagon's Nexus platform and the Altium 365 platform to address four key areas:

1. ***Manufacturing sustainability*** – helping manufacturers identify and implement more sustainable manufacturing processes and technologies that reduce waste and minimize environmental impact through continuous improvement.
2. ***Design for sustainability*** – empowering engineers with data-driven workflows that use advanced simulation-led design, virtual prototyping and quality inspection techniques to create sustainable products using the right material, design and manufacturing processes.
3. ***Fostering innovation*** – working with the market to develop new solutions that meet evolving market needs and address current and future challenges; for example, through Hexagon's Sixth Sense start-up ecosystem and support programme.
4. ***Enterprise solutions*** – providing solutions that offer the electronics industry the compelling business differentiators and intelligence companies need to embrace greater innovation for sustainability.

The partnership is wide ranging, with developments planned throughout 2023 and beyond, with initial solutions focusing on reducing eWaste (electronic waste) through carbon dioxide impact tracking and recyclability improvements made available through Hexagon's Nexus digital reality platform and the Altium 365 platform electronics product design platform that unites PCB design, MCAD, data management, and teamwork.

"IPC congratulates Altium and Hexagon on their partnership enhancing sustainability," said John Mitchell, President & CEO of industry standards group IPC, "Altium's expertise in PCB design and supply chain, combined with Hexagon's metrology and analytics capabilities, strengthens the company's position as a leading authority for the electronics industry on environmental sustainability and a valued partner in IPC initiatives, including our soon-to-be announced Sustainability Leadership Council".

"Sustainability is a key talking point on the executive agendas of nearly every company in our industry," says Ted Pawela, Chief Ecosystem Officer at Altium. "Our partnership with Hexagon will enable real progress in tracking and reporting – and most importantly - improvement on the key sustainability metrics that our customers need to address. We look forward to ongoing collaboration with IPC and Hexagon to help create a more sustainable future for our industry."

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+/- 0.100mm	0.001 mm	+/- 0.040 mm

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Continental's Bangalore Plant bags Gold In Green Plant Certification

TECHNOLOGY COMPANY CONTINENTAL is on the course to achieving 100 per cent carbon neutrality along its entire value chain by 2050 at the latest. In this pursuit, Continental has been auditing and recognising all its manufacturing plants across the globe on sustainability practices and awarding the Green Plant Label (GPL) certification.

The Bangalore plant was recently audited and has achieved yet another milestone by receiving a gold certification in Green Plant Labeling. After the Regensburg plant in Germany, the Bangalore plant is the second location to receive a gold certification within Continental, from among 58 automotive plants globally. The Green Plant Label evaluates criteria such as energy efficiency, water consumption, emission control, waste and recycling management, and innovations in the research and development (R&D) space.

According to Phanindra Karody, Head of the Bangalore Plant, Continental Automotive India, "The gold certification in Green Plant Label is a remarkable feat for the Bangalore plant and we were steadfast in our efforts to achieve this. For us, sustainability is at the core of our business and manufacturing practices. At our state-of-the-art plant, we follow Industry 4.0 practices in all areas enabling smart manufacturing and data-driven operational management. The Bangalore plant is a fine example and a step in the right direction in realizing Continental's vision to achieve carbon neutrality."

Cummins invests $1 billion in across U.S. manufacturing network

CUMMINS has announced that in addition to recent investments in Fridley, the company is investing more than $1 billion across its U.S. engine manufacturing network in Indiana, North Carolina and New York. The investment will provide upgrades to those facilities to support the industry's first fuel-agnostic engine platforms that will run on low-carbon fuels, including natural gas, diesel and eventually hydrogen, helping decarbonize the nation's truck fleets.

"The historic investments included in those pieces of legislation played a key role in our decision to manufacture products here in the U.S., creating more clean-tech jobs and positively impacting our communities," said Jennifer Rumsey, Cummins President and CEO. He continued, "The electrolyzer production in Minnesota and investment in our Indiana, North Carolina and New York facilities are reflective of our dual path approach of advancing both engine-based and zero-emission solutions – an approach that is best for all of our stakeholders and our impact on the planet. We can't do this alone and are grateful for the continued partnership and collaboration with congressional leaders and the Biden Administration."

Lenzing Group introduces Fiber Recycling Initiative

LENZING GROUP, a leading global producer of wood-based speciality fibres, introduced the initial phase of the "Fiber Recycling Initiative" by TENCEL™ alongside its valued mill partners, Artistic Milliners from Pakistan, Canatiba from Brazil and Textil Santanderina from Spain. Dedicated to driving circularity in the global textile industry, the new initiative kicks off with the production of denim fabrics derived from mechanically recycled TENCEL™ branded lyocell fibres. With the usage of pre-consumer lyocell waste at a commercial scale, the initiative redefines the circular future of a sustainable denim industry globally.

It is expected that th, Fiber Recycling Initiative by TENCEL™ set to transform the future of the textile industry with circularity and innovation at heart, starting with the denim segment in the initial phase. "Brands and consumers count on us to lead the change towards a more sustainable industry value chain," said Tuncay Kılıçkan, Head of Global Business Development, Denim, at Lenzing. "As we constantly seek ways to improve circularity across various components of the textile industry, our like-minded, decades-long value chain partners have innovatively discovered the mechanical recycling of TENCEL™ Lyocell fibres in denim production. While concepts as such are still relatively new to the wider industry, the development of the "Fiber Recycling Initiative" by TENCEL™ sets out to promote the benefits and unleash the full potential of the new circular fabric."

New Citroën Ë-C3 all-electric clinches the top three spots in the pro category at EV Car Rally

CITROËN INDIA participated in India's first-ever EV Car Rally organized by PHD Chamber of Commerce and won laurels by claiming the top three ranks on the podium. Citroën's pro-rally drivers Dilip Vadnagra and Pulkit Srivastava, Vanishree Pathak and Kashish Malhotra, Ashish Budhia and Shailendra Singh clinched the top three spots in the pro category. The 100 km event hosted by PHD Chamber of Commerce & Industries took place on 12th March started at Cyber hub, PHD house and ended at Heritage Transport Museum Gurugram.

A total of 35 EV vehicles participated in the FMSCI Regulated rally. Saurabh Vatsa, Brand Head, Citroën India, remarked, "We are extremely glad to have participated in India's first-ever PHDCCI EV Car Rally and take home the top three spots. This highlights EV technology prowess of the New Citroën Ë-C3 All-Electric, which combines class-leading range and ideal performance.

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LAPP India is a leading manufacturer of integrated products and end-to-end solutions in the cable and connection industry. Headquartered in Stuttgart, Germany, LAPP initiated its operations in India in 1996. Today, LAPP India has been catering to customers across segments like automation, textile, automotive, machine tools, oil & gas, renewable energy, process industries, infrastructure and building sectors. Our wide range of standardised products and plug and play customisable solutions are recognised for their impeccable quality and reliability. LAPP India is hence your trusted and preferred partner for all cable and connectivity requirements.

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Best Power Equipments (BPE) Appoints Sushil Virmani as Managing Director

BPE (BEST POWER EQUIPMENTS), India's prominent manufacturer of end-to-end strategic power solutions, has appointed Sushil Virmani as the Managing Director of BPE. Sushil Virmani, a veteran of the power industry, will be instrumental in fuelling the growth of BPE as a global player. Before this, Virmani was the Managing Director of Socomec Innovative Power Solutions Pvt. Ltd. for around 8 years. Under his leadership, Socomec has achieved profitable business growth and consistently outperformed the market in all areas of operations, namely power control and systems, critical power, energy efficiency, etc.

Welcoming Sushil Virmani as its Managing Director, BPE's Founder and Group Managing Director, Amitansu Satpathy, said, "In the last 20 years, we have built a strong customer base and channel network. Expressing confidence in Virmani's leadership, Amitansu further added that we aim to build a large enterprise customer base across the globe. We look forward to a new golden period under his leadership to make BPE the best power company globally."

Sushil Virmani, upon his appointment, said, "I am excited about my new role. I look forward to new challenges as well as the opportunity to further strengthen our customer base by leveraging the established channel base and introducing a product portfolio that is developed based on the insights of the market."

Godrej Aerospace contributes to ISRO's heaviest rocket LVM3

GODREJ AEROSPACE, a business unit of Godrej & Boyce, has contributed to the LVM3 (Launch Vehicle Mark III), ISRO's heaviest launcher to date. For this mission, the L110 engine for the core stage and the CE20 engine thrust chamber for the upper stage has been made by Godrej Aerospace. With a steadfast dedication to indigenous manufacturing for India's space endeavours, Godrej Aerospace has contributed to all PSLV and GSLV launches in the country and has delivered over 175 engines and other critical equipment to date.

With the government's new policy initiatives to empower 'Atmanirbhar Bharat', new opportunities for partnerships in domestic programs have been created for private players in the Indian Space industry. Godrej Aerospace has invested Rs 250 crore to build a new facility at Khalapur in Maharashtra to propel India's technological prowess in the Space domain on a global stage.

Godrej Aerospace's long-standing partnership with ISRO has paved the way for the development of advanced launch vehicle subsystems, liquid propulsion engines for PSLV and GSLV rockets, satellite thrusters, and antenna systems.

"Urban Mobility Happiness Survey" reveals 71 per cent of Indian car owners travel solo or with one co-passenger

MG MOTOR INDIA released its report on the findings of Urban Mobility Happiness Survey today. The survey, conducted by Nielsen gathered valuable insights into the mobility patterns of people residing in major Indian cities, and the challenges they face while commuting. The findings of the survey reflect the state of urban mobility in India, and could prove to be useful for all stakeholders, including policymakers, to facilitate better urban mobility infrastructure for all.

The survey was conducted in the 8 Indian cities of Ahmedabad, Bengaluru, Pune, Mumbai, Delhi NCR, Chennai, Hyderabad, and Kolkata, most of which are known for the numerous challenges faced by their residents during their daily commute. Respondents to the survey included males and females aged 18 to 37 years, having at least one car in their household. Key revelations from the survey are as follows:

74 per cent recognize insufficient parking infrastructure as a common problem: Vehicle parking is a common issue faced by car-owners in Indian cities. Merely 26 per cent of survey respondents found it easy to locate parking, while 74 per cent struggled with the availability and management of parking spaces in their cities. Approximately 64 per cent of individuals reported that they either decided not to use their cars due to the unavailability of parking or had to adjust their plans according to parking availability.

71 per cent of car owners in India travel with only one co-passenger: Shared mobility is not a popular practice amongst most car-owners in Indian cities. About 71 per cent respondents to the survey reported taking their car out alone or at most with one other passenger. Only a meager 1per cent of the respondents reported to always travel with more than one passenger.

73 per cent urban commuters prefer personal mobility for commuting: Cars are commonly used for commuting within the city, with 73 per cent of respondents reporting daily or occasional use for travel to work or college. In addition, urban car-owners frequently use their cars for household errands, shopping, social outings, and weekend trips. 38 per cent of survey participants also reported using their cars for emergency situations.

With petrol still being preferred, respondents identified a major shift in different powertrain options: Despite growing environmental concerns related to fossil fuels, a considerable portion of individuals in major Indian cities still favor petrol-powered vehicles. According to the survey, 50 per cent of respondents own petrol vehicles, while 35 per cent own diesel vehicles. Nonetheless, there is a rising trend among car owners to shift towards alternative powertrain technologies.

81per cent reported using the luggage space for carrying a laptop bag: The findings of the survey reveal that about 77 per cent respondents use the luggage space of their car every day. Amongst these, 81per cent reported using the luggage space for carrying a laptop bag.

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Alstom delivers 300th WAG 12B electric locomotive to Indian Railways

ALSTOM has successfully delivered 300 electric locomotives to the Indian Railways. This marks a significant milestone in increasing the Indian Railways' capabilities to haul heavy freight trains at high speed, to meet its ambitious freight targets. As part of its contract worth €3.5 billion, Alstom is supplying 800 high-powered double-section locomotives of 12,000 HP (9 MW) for freight service. Designated by Indian Railways as WAG-12B, these locos are capable of hauling ~6,000 tonne rakes at a top speed of 120 km/hr.

Marking the milestone delivery, the 300th e-loco was flagged off from Alstom's state-of-the-art locomotive maintenance depot in Nagpur, which was inaugurated by the Hon'ble PM Narendra Modi in December of last year. This milestone was celebrated in the presence of Naresh Lalwani, General Manager, Central Railway, and senior officials from Alstom, along with other key dignitaries from Indian Railways.

Commenting on the milestone, Olivier Loison, Managing Director, Alstom India said, "The Government of India is prioritizing reducing logistics costs in its efforts to boost the economy towards the USD 5 trillion economy target. Indian Railways will play an important role in achieving this goal, and for that, it needs to strengthen its haulage capacity. The Alstom WAG12B electric locomotive has proven to be a capability multiplier, with its ability to haul greater loads at faster speeds."

Vedanta Aluminium recruits transgender security professionals for its largest aluminium smelter

ON NATIONAL SECURITY DAY, Vedanta Aluminium, India's largest producer of aluminium, has recruited seven transgender professionals for the security function of its plant at Jharsuguda (Odisha), which is one of the world's largest aluminium smelters. The seven employees Aarunita Payasingh, Aarohi Sharma, Sandhya Yadav, Siddhi Nage, Khushi Dhruv, Pavitra and Roma Dhruw, joined the company's formidable security team and are responsible for ensuring strict round-the-clock security of the assets and workforce. This is the second hiring of LGBTQIA+ professionals at Vedanta Aluminium, with the previous recruits working at the company's Chhattisgarh-based subsidiary, BALCO, in security and material handling functions. Last year, the company embarked upon the mission to expand its recruitment ambit to tap into the LQBTQIA+ talent pool, who are yet to find acceptance in the mainstream and corporate world.

With 14 transgender employees, Vedanta Aluminium is now amongst the handful of manufacturing companies in India and the world to have LGBTQIA+ employees in core operations. Globally, the gender diversity ratio in manufacturing and heavy engineering industries has traditionally been low, and this deficit is even more acute in metals and mining. To build a diverse workforce, Vedanta Aluminium has been working extensively towards attracting high-potential women and LGBTQIA+ professionals to join its ranks.

To ease their transition from the fringes of society to smart manufacturing plants, and help them evolve from semi-skilled people into professionals, Vedanta Aluminium has adopted a three-pronged approach, that includes:

- Identification of trans people with minimum required skills for working in a manufacturing industry by conducting skill mapping studies.
- Extensive training programs for the recruits, aimed at honing the required skillsets, including soft-skills and business knowledge.
- Building an empathetic & inclusive environment by conducting gender-sensitization sessions for its workforce, with respect to the social and psychological challenges of trans people, proper code of conduct and ways of working to build a cohesive and encouraging environments for all. This also includes ensuring required infrastructural augmentations.

Going forward, the company intends to recruit more employees, both directly and indirectly through its business partners, from the LGBTQIA+ community to further increase the diversity of its workforce.

Speaking about Vedanta Aluminium's endeavours to increase diversity of workforce, Rahul Sharma, CEO, Vedanta Limited – Aluminium Business, said, "Our markets, customers and businesses are diverse and complex. To match that, we believe in recruiting people with diverse experiences, skills, education etc so that the business strategies they formulate, the problems they solve, the innovations they make are correspondingly well-rounded. The secret sauce for our healthy gender-diversity ratio includes gender-agnostic job roles, a merit-driven work culture, a host of global experts who train and groom our employees for success, a sharp & rich learning curve, and a plethora of wellbeing initiatives designed to support them at every stage of their lives. Our ultimate objective is to build a wholesome culture, that makes our employees and partners feel welcomed, encouraged, and empowered to deliver to the best of their potential."

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INOVANCE IS BETTING ON STRONG GROWTH IN INDIAN MANUFACTURING

Industrial automation companies cannot stand still; it is important for them to continuously update their technology to provide better solutions to their customers so they can keep up with the latest trends and remain competitive, feels **Anil Kumar, Managing Director, Inovance Technology India**

Industrial automation received a huge global boost during the pandemic. While the underlying benefits of automation – such as increased efficiency, reduced costs, and improved accuracy and repeatability – have not changed, the Covid lockdowns meant that automation offered manufacturers an additional benefit: the ability to keep operating under conditions of social distancing. In India specifically, the imperative to automate has always been a little behind other parts of the world because of our comparatively lower labour costs. But that is changing fast and it's changing for two reasons.

Firstly, manufacturers are realising that saving labour costs is not usually the prime reason to automate. The prime reason to automate is, arguably, the improved accuracy and repeatability that automation can offer. Secondly, as India moves up the value chain of the global economy, wages are increasing and Indian manufacturers are also attempting to make more complex products (witness the recent stories about Apple looking to increasingly have India as a major manufacturing base for its products).

It is simply not possible to make complex advanced modern products without using up-to-date automation. Most particularly, if India is to succeed in becoming a global manufacturing-for-export hub, automation is essential.

It won't just be factories that automate either. The other ripe target for automation is warehousing. Factories themselves use automated warehouses, but e-commerce warehouses will become an increasingly important part of the economy. The wealthier India gets, the more e-commerce will grow, and intralogistics automation solutions will become critical to running successful e-commerce in India, as they already are in the West.

Of course, before India can become a hub of highly automated manufacturing, it needs a network of industrial automation companies offering the best products and solutions. Industrial automation companies cannot stand still; it is important for them to continuously update their technology to provide better solutions to their customers so they can keep up with the latest trends and remain competitive. The latest digital technologies help Indian manufacturers in a range of different ways, with digital transformation helping them to meet goals relating to productivity,

efficiency, and uptime.

Inovance aims to become an Indian market leader in automation and motion control, and it is striving for this goal by investing heavily to lay down a firm foundation in the country. We have a national sales network that covers Kolkata, Bengaluru, Pune, Coimbatore, Hyderabad, Vadodara, and Jaipur. And we have a large directly employed local team of sales, product management, and research and development engineers based at our network of office facilities in Chennai, Ahmedabad, Mumbai, and New Delhi. Ultimately the reason Inovance is so well placed to succeed is simple: it has a reputation for top-quality products backed up by the strongest engineering expertise and customer support.

Inovance is a complete industrial automation solutions provider with expert engineering capabilities. Its product offering ranges from AC drives, servo drives and motors, to motion control, industrial robots, PLCs, CNCs, and HMIs. Within the industrial automation segment, Inovance supplies OEM machine builders and end users across a wide range of industrial sectors, including packaging, textiles, rubber, plastics, printing, and special-purpose machinery. For example, during the COVID-19 pandemic, Inovance delivered full automation solutions for face mask manufacturing machinery, while working with over 140 OEM customers involved in the production of PPE.

Recently, we launched a new compact, EtherCAT-enabled Easy Series PLC, replacing the previous H1U PLC offering with an improved automation solution. The Easy PLC series is compact and covers everything from simple pulse architecture to complex motion control applications. It supports various field-bus communications like MODBUS-RTU, MODBUS-TCP, EtherCAT, Ethernet/IP and CANopen. This Easy PLC series has an easy-to-use customer interface to achieve maximum efficiency by supporting function block and encapsulation, code reusability, and scalability. One highlight of this PLC is that it can be used widely in all complex automation solutions for the textile, packaging, and printing industries.

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By Rahul Kamat

"EVERY BLUE-COLLAR WORKER WANTS TO BE TREATED AS MORE THAN A RESOURCE"

In an interaction, **Yeshasvini Ramaswamy, CEO, Great Place To Work® India** explains why leaders must play a crucial role since they are the key stakeholders to encourage behaviours and help devise practices that will foster a culture of well-being in the organisation. Edited excerpts:

Can you provide insights into the current state of the manufacturing industry in India? How is the industry gearing up to navigate rapid economic changes?

To capitalise on the immense business opportunity presently available, the manufacturing industry must place a larger emphasis on workplace culture. The current state of the industry is defined by employees that have high pride in their job, team, and company. They also have a strong sense of justice at work, which means that management encourages inclusive behaviours, avoids discrimination, and is committed to fair appeals. Lastly, the industry has also a high perception of management competence.

Employees, on the other hand, consider impartiality (confidence in evenhanded decision-making), and equity (belief in a fair process and equal membership in the organisation) as areas of improvement. Apart from that, there is a need for consistent leadership behaviours in decision-making, and keeping promises.

While many aspects of the industry have advanced in recent years, there has been a significant increase in adopting technology, expanding into new markets, collaborating with other companies, investing in skilling and reskilling programs, supporting businesses with government policies, building better infrastructure, and focusing on sustainability to prepare for the future.

India is poised to become a global manufacturing hub this decade. What job opportunities will it create?

India's potential to become a global manufacturing hub is projected to provide a wide range of job possibilities in industries such as automotive, electronics, textiles, and others, giving opportunities for both skilled and unskilled employees.

As India becomes a manufacturing powerhouse, there will be a greater demand for qualified individuals to manage the logistics and supply chain of goods,

"India's potential to become a global manufacturing hub is projected to provide a wide range of job possibilities in industries such as automotive, electronics, textiles, and others, giving opportunities for both skilled and unskilled employees.

practice developing and communicating wellness plans, providing resources when required, encouraging personal timeout, fostering a work-life balance, and providing wellness incentives.

To ensure employee wellness is a success, leadership should also ensure that the employees get the feeling

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of utmost caring. When employees perceive these leadership behaviours to be true, they have a significant positive impact on their well-being as it leads to an increased sense of belonging and connection, improved job satisfaction, enhanced trust, better stress management, and increased engagement.

What strategies should be implemented to increase employee engagement within a manufacturing organisation?

To increase employee engagement in manufacturing organisations, focusing on building a fair and transparent workplace will be vital in retaining employees and motivating them to do their best. Fairness at the workplace in the manufacturing industry is the lowest-scoring workplace culture aspect as well as the biggest differentiator for Best Workplaces in Manufacturing. Thus, prioritising practices that lead to employees perceiving workplaces as fair will be the first step for leaders. This will include having fair/ bias-free practices and ensuring that managerial behaviour is aligned.

The second step will be to focus on developing people managers. Along with competence in ensuring business results, management must focus on building authentic connections at the workplace. The payoff for organisations with effective leaders who excel on both sides of the lens is significant. They can achieve their goals and objectives, improve their bottom line, retain top talent, foster innovation and creativity, and enhance their reputation and brand image.

Every employee today, and even more in the upcoming era will want to be treated as more than just a resource, they want to feel valued and involved in the process of making an impact and contributing to society. Hence, this aspect of leadership will be of utmost importance and remain a differentiator for the future as well. At Best Workplaces in Manufacturing, 10 per cent more employees respond positively to management showing competence in running the business and building authentic connections at the workplace.

How do blue-collar workers get recognised in the manufacturing industry?

Recognition for blue-collar workers in the manufacturing industry can come in many forms. What is important for companies – is to have systems in place that allow employees to be recognised for their hard work and contributions, and to provide opportunities for career advancement and professional development.

Companies must have performance assessments in place that allow managers to offer feedback and recognition for team members based on work performance for blue-collar employees to be recognized. Leaders must also verify that assessments are viewed as fair by everybody, as well as the sense of equal chance for recognition, methods to appeal fairly against them, and impartiality by managers are regularly experienced by blue-collar employees.

LET'S GEAR UP!

Gursaurabh Singh, Founder, Dhruv Vidyut

It's common nowadays, to see the automotive market being filled with electric vehicles. From range to the charging facility, the manufacturers in the auto industry are upgrading infrastructure and they are doing so in the best interest of all. But, who can think about turning a bicycle into an e-bike which is, despite massive automotive transformation still a primary mode of transportation for 58 per cent of commuters in India!

However, it was the dream of a common Indian who thought, why can't every Indian have his/her mode of transport that is sustainable, affordable and simple? It was Gursaurabh Singh, Founder, Dhruv Vidyut who made it possible with his out of box EV innovation for the classy bicycle. During his DisrputX talk at the Festival of Manufacturing, he shared his side of the story as to why such innovation was required, especially for the bicycle. He said, "After doing the research I realised that to bring such a change there were two things that need to be focused on. First, it needs to happen on a micro-scale, hence I selected cycles."

Secondly, he explained, should be retro fitment in the existing vehicle. "We don't change the entire vehicle. We just change the power source." He further cites an example of the use of a CNG kit. "Similarly, the bicycle won't require any cutting or welding in the frame. Before the process of manufacturing, there is the process of R&D, where we understand the needs of the market. The design needs to be robust, affordable, and sustainable."

With a hands-on experience of 10 years, in production processes, machining, die making, fabrication, and welding processes, Gursaurabh, developed 'Dhruv Vidyut Electric Conversion Kit (DVECK)' which can turn a bicycle into an Electric Vehicle with multi-purpose features. With 'bolt-on' supported DVECK which fits like a glove, any cycle can be turned electric without any cutting, moulding, or fabrication. The cycle-turned-EV can be charged going off-grid with solar power also and it supports an electronic charging inlet for mobile phones.

TRULY AATMANIRBHAR

Gursaurabh's DVECK is a true testimony to India's Aatmanirbhar initiative which defied the general understanding of creating a groundbreaking technology that requires a big lab, funding rounds, a big team, and the best equipment facility. "We have done it without any advanced shopfloor and testing facility," he said during his presentation.

During his talk, Gursaurabh demonstrated the mighty DVECK kit for the bicycle which is waterproof and fire-resistant. Moreover, the material of the DVECK used is aircraft-grade aluminium which makes it rustproof and lightweight. Dignified with the triangulated design, the DVECK comes with a battery indicator, ignition switch, and throttle. With a maximum range of 40 km per charge, Swadeshi Cycle Supports a top speed of 25 kmph and can bear a maximum payload of 170 kg.

Stating as an excellent example of the struggle for local innovations at the pace of India's exponential development, Gursaurabh has led great efforts to make this e-bicycle competent to modern commercial EVs.

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THE FESTIVAL OF MANUFACTURING, LET'S KEEP CELEBRATING!

By Rahul Kamat

As we celebrate this festival, let's take a moment to appreciate the incredible impact that manufacturing has on our lives. Everything we use, from our phones to our cars, has been made by the skilled hands of engineers, designers, and technicians. Their hard work and dedication allow us to enjoy the comforts and conveniences of modern life.

The Festival of Manufacturing is an annual symposium that aims to bring together professionals, researchers, and policymakers from the manufacturing industry to share knowledge and ideas on the latest developments, challenges, and opportunities in the sector. The 2023 edition of the conference, held at Dr Ambedkar International Centre, Delhi on 24th March 2023, was a resounding success, attracting over 600 attendees in the manufacturing sector from all over the country.

The Festival of Manufacturing kicked off on 23rd March with a Gala Dinner which was attended by our Brand Ambassadors, partners, concerned ministries and delegates from the manufacturing sector. In fact, on behalf of our Brand Ambassadors, our team did a tree plantation drive which will be managed by ET Edge in future.

That said, the conference, which took place on 24th March was organised

around several themes, including Industry 4.0, sustainable manufacturing, digital transformation, and skills development. The keynote speeches by **Dr Bhagwat Karad, Minister of State, Ministry of Finance, Government of India and Mr Narayan Rane, Union Minister, Ministry of Micro, Small & Medium Enterprises, Government of India** and panel discussions featured a diverse range of perspectives from industry leaders, academics, and government officials, providing valuable insights into the current state of manufacturing and the future direction of the industry.

THE GALA DINNER

It was 8 p.m. with 15 minutes more to go for the Gala Dinner of the manufacturing industry. Meanwhile, the Sovereign Hall at New Delhi's Le Meridian was already filled. The who's who of the country's manufacturing sector had started arriving nearly an hour before the prestigious Gala Dinner for the Festival of Manufacturing. A few from outside the city even arrived with their trolley bags directly from the airport!

The Festival of Manufacturing's presenting partner is Exxon Mobil, in association Partner RR KABEL, the Gold partner was Ace Micromatic Group, Banking Partner was State Bank of India, Associate Partner was igus India, the exhibition partners were Schunk, Elgi Equipment Ltd and Tally, and supported by the Ministry of Heavy Industries, Ministry of MSME and Ease of Doing Business.

By bringing together the various stakeholders in the manufacturing sector, the Gala Dinner also provided the participants with a platform to both reconnect and network with each other. As curtains came down on the evening, a visibly elated senior executive working with a leading multinational involved in creating software solutions was seen excitedly telling other guests, 'Great show! I'm glad that I could make it.'

PANEL DISCUSSIONS

One of the main topics of discussion was Vision 2030: SAMARTH and SASHAKTA Udyog Bharat. Where the panel comprising H K Agarwal, Managing

Our Government has announced Rs 1.50 lakh cr for industries in India

Dr Bhagwat Karad, Minister of State, Ministry of Finance, Government of India

Today, I am happy to be a part of the Festival of Manufacturing organized by the Times of India group. Festivals and celebrations are a core part of what brings India together as a nation of diversity, making a positive impact throughout communities.

The Festival of Manufacturing is also an important networking opportunity for manufacturers. With attendees from all over India, the conference provides a platform for manufacturers to meet and build relationships with potential suppliers, customers, and partners. The conference also provides opportunities for manufacturers to collaborate on research and development projects.

In fact, what I liked about this festival is its focus on workforce development. With an ageing workforce and a shortage of skilled labour, workforce development is a critical issue for the manufacturing industry. The conference provides a platform for manufacturers to learn about the latest workforce development initiatives and best practices for attracting and retaining skilled workers.

That said, the manufacturing sector has been making salient contributions in silhouettes. I was surprised to know that the organisers are felicitating the ground-level workers from manufacturing plants who have made an altruistic difference in their organisation. I feel such an initiative will make India more Saksham and Sashakta.

What's more? The government of India is giving importance to the Make in India and Atma Nirbhar Bharat, Ease of Doing Business, PLI Schemes, Startup India etc which are helping various industries. My ministry, i.e. Ministry of Finance has announced Rs 1.50 lakh crore to help state governments in India of which Rs 50,000 crore is allocated for states based on their performances in various reforms they are undertaking, especially industry reforms.

Our government has transformed India into a country of hope by creating immense opportunities for global trade and commerce. Our government has focussed on two key aspects for the growth of trade and investment, namely the creation of a robust financial network and an ecosystem-based approach to growth.

Our government believes that the reforms are important to improve the quality and production which is why we can witness India as a country becoming a global hub for the manufacturing sector. At present, we are the 5th largest economy in the world, and to become the 3rd largest economy, we have to give impetus to the manufacturing sector and look beyond agriculture.

Director, Grasim Industries; Vipin Rana, CEO, Exxon Mobil Lubricants Pvt Ltd; TK Ramesh, MD, Micromatic Machine Tools; N Venu, Managing Director & CEO, Hitachi Energy in India and South Asia; Kamal Bali, President and MD, Volvo Group, India and Uday Narang, Founder and Chairman, Omega Seiki Mobility and Anglian Omega Group discussed and deliberated on how a thriving manufacturing sector could potentially be the most critical building block for India's economic growth in the coming year. One of the opportunities that a lot of people are talking about is China + 1 model. Global companies are reconfiguring their value chains and sourcing manufacturing footprints. Can India realistically take advantage of this shift? *(Refer to page no 35 for a detailed version)*

Another key attraction was Sudhanshu Mani, Creator of Vande Bharat Express which was a big hit and attended by several industry leaders.

Another key theme was sustainable manufacturing, which involved reducing the environmental impact of manufacturing processes and products. The session

was attended by Navid Talib, President & COO, Hero Ecycle; Amar Variawa, Country Director – Public Affairs, Sustainability & ESG, Michelin; Preeti Bajaj, CEO & MD, Luminous Power Technologies; Shekhar Kashalikar, Chief Executive Officer, Thermax Babcock & Wilcox Energy Solutions. Many companies are adopting sustainable practices such as using renewable energy, reducing waste and designing products for recyclability. *(Refer to page no 42 for a detailed version)*

One of the main attractions of FOM was the performance in the Atrium Lounge by Colors of India and Inspiring Stories in Nalanda Hall. What's more? Digital transformation was also a prominent topic, with speakers like Amol Nagar, Managing Director, MMF – India, GE Aviation; Shishir Sharma, Chief Sales Officer, RR Kabel; Narendra Shah, Director, Bayer Vapi; Anil Choudhary, Vice President - Materials, Industrial Solutions and Surface Technologies for BASF India & Whole-time Director, BASF India Ltd and Zurvan Marolia, Sr Vice President and Head Manufacturing Council, Godrej and Boyce discussing the challenges and opportunities of digitising manufacturing processes. *(Refer to page no 44 for a detailed version)*

Digital transformation can improve efficiency, reduce costs, and enable new business models, but it requires significant investment and organisational change. The conference featured several presentations on best practices for digital transformation and the

We want to include 12 crore MSMEs by 2030

Mr Narayan Rane, Union Minister, Ministry of Micro, Small and Medium Enterprises, Government of India

The Festival of Manufacturing which is organized by The Times of India, and attended by various entrepreneurs is a great platform for the various MSME manufacturers to grow their businesses. To increase employment, improve the country's GDP, increase the country's overall exports, and make the country Aatma Nirbhar, is a well-known ambition of our Prime Minister Mr Narendra Modi.

When Mr Narendra Modi became the Prime Minister of India in 2014, India ranked 10th in the world economy. Eight years later, we are in the 5th position and by 2030 we aim to be the 3rd largest economy in the world. Friends, if we want to achieve this target, we must focus on the manufacturing sector.

Friends, if you have gone through the 2023-24 budget, there is a lot of aid provided to the MSME industries. Meanwhile, I would like to congratulate the Times of India group for encouraging the MSME industry to participate in the Festival of Manufacturing.

That said, we are in the 21st century now, and as an industry, there is an utmost need to introduce new technologies to increase the overall production pattern. And this would help Indian companies to grow the export than imports. We must curb the import and truly believe in Make in India for India and the world concept. And, I am sure this would lead us to achieve the 3rd largest economy in the world target.

The young generation must know the latest technology. Robotics, 3D printing, Aerospace, Defence equipment, Drones, and Telecommunication sector industries need special attention.

Let me cite an example, a food processing unit in India can produce up to 10,000 juice cans at the same time a food processing unit from China can produce 100,000 juice cans. The question is how is that possible? It is possible with the help of the right technology and machinery advancements.

Under my ministry, there are 6.4 crore MSMEs in India which is employing 11.5 crore people. We aim to increase the MSMEs by 12 crores in 2030.

importance of developing a comprehensive digital strategy.

Skills development was another important theme. Here, Prakash Guha, MD & CEO, Zuventus Healthcare; Prashanth Doreswamy, President and CEO, Continental India; Bipul Chandra, Managing Director, Ducati India, Ramashankar Pandey, MD, Tata Batteries and Shailendra Shukla, MD Vehicle Group, Eaton India emphasised the need to upskill the workforce to meet the changing demands of the manufacturing industry. Many companies are investing in training programs to help workers acquire new skills and adapt to new technologies, but there is still a significant skills gap that needs to be addressed. *(Refer to page no 38 for a detailed version)*

Overall, the Festival of Manufacturing 2023 was a highly informative and engaging celebration that provided valuable insights into the current state and future direction of the manufacturing industry. The conference demonstrated that the industry is undergoing significant transformation, driven by advanced technologies, sustainability imperatives, and changing customer demands. To succeed in this new environment, companies will need to be agile, innovative, and willing to invest in new technologies and skills development.

VANDE BHARAT EXPRESS IS A SYMBOL OF A RESURGENT AND ASPIRATIONAL INDIA

Sudhanshu Mani, Creator & Innovator, Vande Bharat Express

India's first indigenous semi-high-speed train has gained popularity among the citizens. Hailing the successful operation of Vande Bharat Express during the DisruptX talk at the Festival of Manufacturing, Sudhanshu Mani, the creator and innovator of the Vande Bharat Express train, said that the manufacturing and production of blue and white colour trains have boosted the 'Make In India' campaign of Prime Minister Narendra Modi-led government. "The production of Vande Bharat Express has added spin to the journey of India towards a self-reliant or Aatma Nirbhar Bharat," he added.

But the journey of creating Vande Bharat Express was not an easy cakewalk for Mani and his team. Ministry officials doubted our claims to develop a world-class train at one-third cost; they thought our claim was just a publicity stunt," Mani said.

During the interaction with the audience, he revealed

that when he approached the then Chairman of the Railway Board. He pitched Train 18 to him, and even assured that the ICF team can manufacture a world-class train at one-third the cost of importing such a train from abroad.

"The Chairman was about to retire in about 14 months. Therefore, we had to lie to get the work done. We said that this train would be ready before his retirement and he will be the one to inaugurate it. While we knew that it was not possible to complete this work in such a short time," he added.

Despite all efforts, approval was not given. Not prepared to take no for an answer, Mani added, he caught hold of the official's feet and said he would let go only if he is permitted the project.

CREATING TRAIN 18

When the Railways was planning to import a semi-high-speed train in 2016, Mani became General Manager at the Integral Coach Factory Chennai. "I was posted as GM of ICF in 2016. Dream without a vision or a vision without action is meaningless," he said and further added: "I met the Chairman, Railway Board, and sought a fund of Rs 200 crore to manufacture a train."

As he proposed the idea of developing a semi-high-speed train with indigenous technology that could compete with the imported trains in terms of speed and quality while being cost-effective. Sudhanshu added, "This proposal was initially met with scepticism from the Railway Board officers, but with my persistence, the project was approved."

Finally, we got permission to make this train. As soon as it was approved, the whole team started working on it. It was a project, so it needed a name. That's when we named it "Train 18". Our hard work paid off when we made a train in 18 months that would have taken 3 years to make abroad. Later, it was named "Vande Bharat".

CHALLENGES

One of the biggest challenges was to prepare the frame of the semi-high speed bogies for Train 18. Mani found a company in Kanpur that could make the frame and handed it over to the Integral Coach Factory. A team of 50 railway engineers and 500 factory workers then worked continuously to design and prepare the prototype rack of Vande Bharat in just 18 months.

Mani revealed that to make his dream of manufacturing a new train successfully, he undertook many efforts to bridge the gaps with a few simple acts. "I went through the factory and met the employees. They never met a GM," he revealed. "They have never seen the GM's bungalow before except the senior officials." He said, "I always wondered that with a huge pool of railway engineers in this large system, however, we can't have a train that is aesthetically superior or faster."

By the time he retired from ICF, the coach factory which is one of the biggest manufacturers of train coaches in the world had churned out two Vande Bharat Express trains.

By Nisha Shukla

VISION 2030: SAMARTH AND SASHAKTA UDYOG BHARAT

The panel deliberated on how a thriving manufacturing sector could potentially be the most critical building block for India's economic growth in the coming year. It also focussed on how global companies are re-configuring their value chains and sourcing manufacturing footprints.

After the felicitation of the Champions of manufacturing and the keynote address by Dr Bhagwat Karad, the Festival of Manufacturing kickstarted with its first-panel discussion on Vision 2030: SAMARTH and SASHAKTA Udyog Bharat, held at Bhim Hall. The panel comprised Managing Director of Grasim Industries - H K Agarwal; Vipin Rana, CEO, Exxon Mobil Lubricants Pvt Ltd; TK Ramesh, MD, Micromatic Machine Tools; N Venu, Managing Director & CEO, Hitachi Energy in India, and South Asia; Kamal Bali, President and MD, Volvo Group, India; and Uday Narang, Founder and Chairman, Omega Seiki Mobility and Anglian Omega Group. The power-packed panel discussion moderated by Vaibhav Dange, Former Advisor, NHAI, deliberated on how a thriving manufacturing sector could potentially be the most critical building block for India's economic growth in the coming year. It also focussed on how global companies are re-configuring their value chains and sourcing manufacturing footprints.

The discussion started with Vaibhav Dange, Former Advisor, NHAI, talking about the Hon'ble Prime Minister's continuous emphasis on his pet project - 'Make in India' and how this campaign would be crucial for the country's economic growth. He also mentioned the tangible target that the Hon'ble PM has given to the manufacturing industry of increasing their contribution to the GDP from 16 per cent to 25 per cent. However, he categorically stated that achieving such a focused target would need attracting investments, which will also be crucial in accomplishing the five trillion-dollar economy target.

Dange also emphasized on the fact, that post-COVID, ample opportunities are coming to India, at a time when the whole world is looking at China plus one manufacturing model. And all these factors are

H K Agarwal
Managing Director of Grasim Industries

Vipin Rana
CEO, Exxon Mobil Lubricants Pvt Ltd

TK Ramesh
MD, Micromatic Machine Tools

offering India a huge opportunity to present itself as a global manufacturing hub.

Posing a question to the panel members, Dange asked what are the other factors that will help Indian Manufacturing to become Sashakt and Samarth? To which, **Vipin Rana, CEO, Exxon Mobil Lubricants Pvt Ltd,** said, "For India to emerge as a credible global manufacturing hub, there are certain enablers required for its transformation. The first one is government policy, followed by investment in technology and human resources, and the adoption of digital technology." The last element, which he emphasised as most important one was, "a need for a cultural transformation, that sometimes is not as visibly present."

Agreeing with Rana's point of view on the need for cultural transformation, **H K Agarwal, Managing Director, Grasim Industries,** cited data from a recent survey which indicated that only 27-28 per cent of parents encourage their children to opt for a career in manufacturing. "This is not a very healthy situation, and the industry will have to compete for talent against services or other professions. The sector should focus on becoming safer. It should also work towards improving the quality of life of its people, with more emphasis on the quality of its human resources," he added.

With Apple shifting its iPhones manufacturing base in India from China, Agarwal termed this move as a proud moment. However, he highlighted that the quality rate of several components is still 50 per cent. "Nobody can compete with a 50 per cent rejection rate. Of course, it is an initial learning curve, but this also reflects several issues that India needs to work on," highlighted Agarwal.

Given, the output quality is still questionable, he stressed developing a culture of quality over quantity. "Be it quality of education in the school or colleges or quality of training in the industry," Agarwal said, "the basis of everything should be on developing a culture of excellence and quality."

N Venu, Managing Director & CEO of Hitachi Energy in India and South Asia cited an interesting data on global output. According to him, India's manufacturing output today accounts for around 3.1 per cent of global output. The manufacturing output of two biggest countries, China & USA, account for 29 per cent and 16 per cent respectively.

Commenting on the data, Venu said, "If you see, 50 per cent of the manufacturing outputs lie with these two countries (China & USA). Today, we are at 3.1 per cent, so what we need as a country is not incremental growth. We need to leapfrog to reach what we have envisaged becoming. And this can happen if we work towards end-to-end, innovation-led and technology-led manufacturing, not only for the large-scale organization but the whole value chain, such as small and medium enterprises."

He also highlighted that India should focus on increasing the amount they spend on innovation. Citing data from U.S. private Industries, N Venu highlighted that the USA spent close to nine per cent of its sales on their in-house R&D. On the other hand, Germany spends close to four per cent, whereas China spends nearly two and a half per cent. However, India spent almost 0.3 per cent.

Given the gap, N Venu stated, "If there is no innovation, then we will not be able to manufacture. Currently, what we are doing is more offshoring. However, we need to practice more innovation-led manufacturing growth."

TK Ramesh, MD, Micromatic Machine Tools questioned, "Can we be Samarth and Sashakta? "I don't see any reason why we can't. Do we have a choice not to become? I don't believe we have a choice." However, an optimistic Ramesh stated that this discussion on building a Samarth and Sashakt Udyog Bharat is in itself a fact that a step has already been taken in this direction. "A lot of work is happening on that front, and the best part is that several Indian companies have been doing a lot of work. Even a lot of multinationals are coming here. We have been making in India for

N Venu, Managing Director & CEO,
Hitachi Energy in India, and South Asia

Kamal Bali
President and MD, Volvo Group, India

Uday Narang, Founder and Chairman,
Omega Seiki Mobility and Anglian Omega Group

India, and I believe we will Make in India for the world," said TK Ramesh.

According to **Uday Narang, Founder and Chairman, Omega Seiki Mobility and Anglian Omega Group,** the young generations and Nari Shakti (women counterparts) are the ones who are going to lead this country. He further stated that not everybody needs to have a Master's or Undergraduate degree, the only thing that is needed is a full-fledged technical and internship programs to help people learn.

He also mentioned that we (Indians) should stop comparing ourselves to the United States or Europe, as there's no comparison between what they're doing and what we are doing. "But what we need to do is build the ecosystem. We can't compete with China or Japan or Korea unless we build the ecosystem, and this needs an alliance-based business," he added.

Talking on alliance-based business, Narang said, "I see a lot of players here doing alignment where you can have MSME, bigger organizations and public-private partnerships. Even at Omega Seiki Mobility, we have built alliances over the years and everything we have made in India. There is no problem having an alliance with Europe, Japan, Korea or wherever, but one should ensure to make and build the ecosystem here in India."

Another thing that Narang suggested was to focus on setting up manufacturing facilities in rural areas. He says that these facilities don't need to be only in the big cities. "We should look at locations such as Jharkhand, UP, rural Karnataka, Tamil Nadu etc. The next 10 years or the next two decades belong to us. I think we should stop complaining, do hard work and stop asking the government for a handout on everything," he added.

On developing India as manufacturing hub, Bali said, "India needs to be a manufacturing hub as we don't have an option. We have 1.4 billion people to feed; we need to be self-reliant. We need to create 90 million more jobs by 2030 and just services and agriculture cannot do it alone."

He further stated that, it is essential to look at manufacturing in a big way, as far as rebalancing of global value chain is concerned, thanks to COVID. "Almost 4 trillion dollars of manufacturing is moving out of certain geographies today. Therefore 20 per cent of the shift happens towards India. Out of $4 trillion, our manufacturing which is about $400 billion today, will go to $1.2 trillion and in another two to three years' time, it will surely touch a $5 trillion economy. You will be exactly 25 per cent of GDP. So, as I look at the things, they are looking very well in terms of the whole setting and dynamics at the macro level."

At micro level, he pointed out three aspects. To begin with, "we need to look at achieving excellence in manufacturing through three buckets. The first bucket involves the domestic ecosystem, the second bucket is firm level capacity and competitiveness, and the third bucket is the global ecosystem," said Bali.

He further noted that it is important to closely look at the domestic ecosystem. By this, "I mean ease of doing business, the cost of doing business, the speed of doing business, lack of Inspector Raj, among others. I think all of these must fit into the first bucket where we create a domestic ecosystem in terms of policies, infrastructure reforms which help the manufacturing."

He further stated that the second part is the critical one and the most important one, as it involves need for quality and Innovation. "I will add one more thing to it, which is partnerships because no one company can do the 360 degrees of what the customer wants. You will need more and more partnerships and collaborations to be able to do the 360 degrees," he added.

Along with culture, quality, and ecosystem, Bali also included competitiveness and MSME's as a part of the second bucket. The third piece according to him is the global ecosystem because manufacturing needs volumes and economies of scale. "If we tick these three boxes, I'm sure we will be there and soon India will be the Manufacturing Powerhouse of the world," he concluded.

By Rahul Kamat

WHY SKILL DEVELOPMENT IS CRUCIAL TO NEW-AGE MANUFACTURING?

The panel discussed skill requirements to cope with the technological trends in the sector. Besides, it also focuses on how the training institutions should update their curriculum to align it better with the evolving technologies and how can industry transform the manufacturing sector as an aspirational profession.

Manufacturing is one of the crucial industry sectors in India. The potential for employment in this sector is immense with new-age, digital technologies disrupting the industry. Training candidates in evolving technologies has become mandatory to cater to the requirements of the skilled workforce in this sector.

Answering the question of how the new-edge technologies have been adapted in the manufacturing sector, **Prashanth Doreswamy, President and CEO, Continental India** said, "To understand why skill development is required in the new-age of manufacturing we need to understand what kind of transformations are happening which is important for the success of today, and tomorrow as well."

Doreswamy lists down six proprieties – Industry 4.0, demand for quality and efficiency, new technologies and trends, increased focus on sustainability, Make in India and lastly, gender parity. He further said, "Unfortunately, within manufacturing, I think the involvement of female workers is less than 17 per cent."

Taking the discussion further, **Shailendra Shukla, MD Vehicle Group, Eaton India** questions why there is a need for new-age technology. He further explains, "We need safety, faster productivity, quality, and efficient delivery, and then there is a cost. According to Shukla, the new-age manufacturing will be driven by sustainability, energy and digitisation. And I believe that our workforce needs to be upskilled or reskilled.

Vinit Goenka, who was moderating the session, talked about the importance of gender diversity in the manufacturing sector. During the discussion, he mentioned the Pradhan Mantri Kaushal Vikas Yojna which retained around 1.37 crore workforce and

Prashanth Doreswamy
President and CEO, Continental India

Shailendra Shukla
MD Vehicle Group, Eaton India

Suman Yadav
Vice President - Operations, Hindware

asked the panellist should the training institutions update their curriculum to align it better with evolving technologies. Is a degree more important than a skill? To this, **Suman Yadav, Vice President - Operations, Hindware** said, "The demand and skillset for the manufacturing industry is changing now. The onus is just not on the institution, but also on the industry at large, to collaborate with such institutes and develop an ecosystem."

At present, he further explains, the manufacturing companies set up training centres where they train people to get a first-hand experience in their process knowledge. What eventually these manufacturing companies are doing is inside their establishments. "I think, this needs to change and manufacturing establishments should extend support to institutes in building a curriculum in line with present changes."

Ramashankar Pandey, MD, Tata Batteries feels that we, as Indians, are highly obsessed with degree and designation. "So in our country, the designation moves with an understanding that he/she is skilled or not. In our country, at least any mother who wants to marry her girlchild to somebody called a master plumber or the chief technician is very less or negligible. This is because society does not recognise the skill, and gives more impetus to the reputation which comes with designation."

Meanwhile, **Prakash Guha, MD & CEO, Zuventus Healthcare** explains to the audience that pharma manufacturing is different because pharma is a knowledge-based industry and requires a certain set of skills. He said, "Pharma industry has already adopted new-edge technologies such as digitisation and robotics. We are also contemplating bringing AI to manufacturing. But all these activities are driven by skilled manpower because the pharma industry is run by the regulators."

During the discussion, **Bipul Chandra, Managing Director, Ducati India** believed that the problem areas in the manufacturing industry are quantifiable, like sales. There is always a reverse process. Increasing the skill level also means giving them (shopfloor workers) ownership of the entire process along with an honest opinion of what the market is thinking about the product. Because, he said, "At the end of the day, what you do in the factory (end product), which is purchased by customers may come back (with defect) and haunt us in the future."

Ramashankar Pandey
MD, Tata Batteries

Prakash Guha
MD & CEO, Zuventus Healthcare

Bipul Chandra
Managing Director, Ducati India

By Rahul Kamat

DECARBONISING INDIA'S MANUFACTURING SECTOR

The share of India's industrial emissions in overall emissions is projected to increase from 28 per cent in 2020 to 35 per cent in 2040. This highlights the need for policy actions that look beyond the incremental process, efficiency gains and aim for deep decarbonisation of industrial energy use. With this session, we get closer to knowing policies, technology innovations and finance solutions to help the sector achieve carbon reduction goals.

In a significant development for the fight against climate change, India declared its intention to achieve net-zero emissions by 2070 at COP26. India is the third-largest emitter globally, emitting a net 2.9 gigatons of carbon dioxide equivalent (GtCO2e) each year as of 2019. This is despite the country's low per-capita emissions (1.8 tonnes of CO2). Six industries—power, steel, automotive, aviation, cement, and agriculture—are primarily responsible for the majority of these emissions (about 70 per cent).

The demand for primary energy from the industrial sector more than doubled between 2005 and 2012, mostly due to the industry's economic expansion. However, India's manufacturing industry still primarily relies on conventional, carbon-intensive fuel sources to meet its energy needs. It is anticipated that by 2040, industrial emissions from India will account for 35 per cent of all emissions, up from 28 per cent in 2020. This emphasises the need for legislative initiatives that aim to decarbonise industrial energy use rather than merely incremental process efficiency increases.

The panel discussion on the topic 'Decarbonisation of India's Manufacturing Sector' was held at the Festival of Manufacturing and focused on the policy to achieve clean energy targets. This highlights the need for policy actions that look beyond the incremental process, efficiency gains and aim for deep decarbonisation of industrial energy use.

The moderator of the panel **Abhijeet Sinha, National Program Director, Ease of Doing Business,** began the session with a thought-provoking question when he asked if New India will teach or be taught by the rest of the world on decarbonisation.

Preeti Bajaj, CEO & MD, Luminous Power Technologies in her opening remarks mentioned, "Technology today is ready for aiding us towards achieving the decarbonisation goals". "Until the covid, most countries bought bicycles from China, but now

Abhijeet Sinha, National Program Director, Ease of Doing Business

Preeti Bajaj, CEO & MD, Luminous Power Technologies

Navid Talib, President & COO, Hero Ecycle

the geopolitical scenario's changed. The demand has shifted from China to the world. The challenge in front of India is to have a supply ecosystem to be able to cater for the demand and price competitiveness", added **Navid Talib, President & COO, Hero Ecycle.**

Among the many possibilities for decarbonising industrial heat, employing hydrogen has important advantages over other energy carriers because it is readily available, can be stored and transferred with high energy density in liquid or gaseous forms, and doesn't emit any emissions at the time of use. This decade will be significant. India can pursue economic growth and speed decarbonisation at scale with deliberate effort.

Shekhar Kashalikar, Chief Executive Officer, Thermax Babcock & Wilcox Energy Solutions said, "We must understand that hydrogen is beneficial for the future but is not affordable as the prices are more than 3 to 5 times rather than following in the Western world. We have to look for our way which is electric vehicles and efficiency. We have to check our regular energy demand to EV and shift the industrial demand to biomass."

In the years to come, the automotive industry's form is likely to shift drastically as it plays a significant part in reversing the climate disaster. One field that has advanced significantly is tyre technology. Decarbonisation efforts have been made by tyre producers. At the same time, tyre technology has shifted its attention more and more towards the part tyres play in helping to optimise vehicles for the environment.

Through lower rolling resistance, tyres can increase a vehicle's fuel efficiency. New digital and data services that promote increased resource usage and vehicle efficiency have also been created by tyre providers. **Amar Variawa, Country Director – Public Affairs, Sustainability & ESG, Michelin** said, "We have an all sustainable approach which very well gels with our strategy which is equally distributed between People, Profit and Planet".

Abhijeet Sinha also shifted the discussion towards the Green standards such as carbon credits and sustainable buildings to achieve the decarbonisation goals. In the fight against climate change, carbon credits—often referred to as "offsets"—play a crucial dual function. They make it possible for businesses to promote decarbonisation outside of the scope of their carbon footprint, hastening the transition to a future with reduced carbon emissions overall.

Additionally, they contribute to the funding of carbon dioxide removal projects, which produce negative emissions that must be neutralised to offset residual emissions that will continue to exist even under the most optimistic decarbonisation scenarios. Also, sustainable and green buildings are an important part of the transition. The utilisation of renewable energy, efficient technology, sustainable material use, and reducing the carbon footprint of the construction process will pave the way for a cleaner, greener future.

Shekhar Kashalikar, Chief Executive Officer, Thermax Babcock & Wilcox Energy Solutions

Amar Variawa, Country Director – Public Affairs, Sustainability & ESG, Michelin

By Rahul Kamat

HOW INDUSTRIES CAN ENABLE SUSTAINABLE MANUFACTURING IN INDIA

The session focused on what is so exciting about sustainable manufacturing and how successful is sustainable manufacturing in the present scenario. Need for a clear and well-defined path for developing a sustainable framework for organisations. The manufacturers should expand their focus from 3Rs i.e reduce, reuse & recycle to - reduce, reuse, recycle, recover, redesign, remanufacturing, repurpose, refurbish, refuse, etc.

Manufacturing done in a way that minimises its adverse effects on the environment, conserves energy and natural resources, protects workers, communities, and consumers, and is also profitable. Manufacturers are becoming more aware of sustainable business practices' substantial to economic and environmental advantages.

By using intelligent edge solutions to gather, analyse, and act on data across their organisation in close to real-time, manufacturers can lessen their environmental impact and find their path to sustainable production. This will increase efficiency, reduce waste, and help manufacturers find opportunities for sustainable innovation.

The panel discussion held on the topic 'How Industries Can Enable Sustainable Manufacturing in India' in the Festival of Manufacturing began with open remarks by distinguished panellists.

In his opening remarks, **Nitin Vyas, Managing Director, Beumer Group** said, "Product in a silo is not sustainable unless a sustainable supply chain is integrated into the Manufacturing". He emphasised

Nitin Vyas, Managing Director, Beumer Group

Arvind Chandra, CEO - Mechatronics and Vehicle Access Systems, Minda Corporation Ltd

Ankush Khanna, South Asia Pacific – Commercial Brand Manager, Exxon Mobil

that looking for sustainability in manufacturing alone will not be enough but the entire product life cycle should be considered and even extended up to cradle to grave.

Arvind Chandra, CEO - Mechatronics and Vehicle Access Systems, Minda Corporation Ltd explained in his open remarks how the automotive industry has a lot of pressure on margins and how his organisation straddles both worlds of achieving the UN's Sustainable Development Goals(SDGs) as well as the Prime Minister's targets for sustainability in whatever they do. He said," Affordable sustainability in manufacturing is very important, We are taking a holistic approach and looking in areas where we can have affordable innovations".

Abhijeet Sinha, National Program Director, Ease of Doing Business

Ankush Khanna, South Asia Pacific – Commercial Brand Manager, Exxon Mobil addressed how the increase in GDP of the nation increases the lifestyle demands of the people, which in turn automatically increases the energy requirements. He said," Energy is the requirement to sustain the lifestyles of the people but we need to be extremely careful and do a balancing act in providing energy to society at large and manage the sustainability ambitions".

The moderator of the panel **Abhijeet Sinha, National Program Director, Ease of Doing Business** took the discussion forward on how Sustainability can remain with the adoption of new technology in manufacturing as many in the industry generally do not consider the after-effects of their blind race to achieve what is best for their self.

The discussion shifted towards measuring the product and the carbon footprint it generates. Today's most prosperous manufacturing companies understand that being environmentally conscious not only benefits their bottom line but also plays a crucial role in how their products are advertised, bought, and used. It is crucial to take sustainability into account throughout the entire life cycle of manufactured goods. "Measuring needs to be done right from the procurement of raw materials, logistics, and packing," said Nitin Vyas. Arvind Chandra added, "The entire ecosystem from the validation of design through to taking it into manufacturing and then to the supplier ecosystem needs to be carefully measured to know the environmental output caused."

The development of fresh methods that utilise less toxic materials and produce fewer emissions, which may thus be deemed green processes, will be vital in addition to refining and optimising the present processes. Building capacity in the manufacturing sector is necessary to accomplish this as well as to measure and audit. The leaders in manufacturing must assume responsibility for this if others are to follow.

"We at Exxon have taken the responsibility to provide energy to the world in a responsible manner through various programs," Ankush Khanna remarked. Reduce, reuse, recycle, recover, redesign, remanufacture, repurpose, refurbish, and discard in addition to the 3Rs should be the makers' new priority in addition to the usage of renewable energy, predictive analysis and smart systems and automation.

Sustainable manufacturing is the most important aspect to be considered by all production engineers, not because it is a fad but a necessity as an obligation to the world we live in. "Every organisation needs to take small steps towards sustainability and environment as it is our responsibility towards our future generations," added Khanna.

By Nisha Shukla

INNOVATION: NEED OF THE HOUR FOR INDIAN MANUFACTURING

Innovation remains a challenge for Indian manufacturing sector. The industry and panellists deliberated on ways and means to further accelerate innovation across manufacturing processes.

India is one of the fastest-growing economies in the world and Innovation is essential to sustain this growth trajectory. With the manufacturing sector contributing significantly to the GDP, innovation can help drive growth, competitiveness, and job creation.

As far as companies are concerned, several manage to achieve success in a short span, but a lack of innovation prevents them from replicating. Innovation remains a challenge for the Indian manufacturing sector. It is encouraging that India has jumped to 40th rank in the global innovation index. There should be more bridges, links or partnerships between academia, industries, and policymakers to facilitate R&D, support talent, cement gaps and propose new ideas. To discuss such new ideas an engaging session was hosted at the Nalanda Hall on Innovation: Need of the Hour for Indian Manufacturing.

The eminent panellists who discussed in length on the topic comprised Amol Nagar, Managing Director, MMF – India, GE Aviation; Shishir Sharma, Chief Sales Officer, RR Kabel; Narendra Shah, Director, Bayer Vapi; Anil Choudhary, Vice President - Materials, Industrial Solutions and Surface Technologies for BASF India & Whole-time Director, BASF India Ltd and Zurvan Marolia, Sr Vice President and Head of Manufacturing Council, Godrej and Boyce. The engaging session was moderated by Rony Banerjee, Advisor, EY.

Banerjee opened the discussion with the panellists asking them, "What is their take on innovation in the manufacturing sector or in generic use? Answering this, Amol Nagar, Managing Director, MMF – India, GE Aviation said, "Innovation in the manufacturing space is a top-down approach, in terms of putting the fund, having consistent effort around it." Further, he noted that "It is convenient for the top line to say, you must do the invention and adequate funding will be provided." However, he emphasised creating an open work culture and behaviour which allows people to

Amol Nagar, Managing Director, MMF – India, GE Aviation

Shishir Sharma, Chief Sales Officer, RR Kabel

Narendra Shah, Director, Bayer Vapi

take the initiative to innovate and create.

He also stated that innovation cannot be just limited to the people who are into R&D. He believes that a lot of innovation happens on the shop floor. "I am a believer that ideas can come from anywhere. But for somebody to come and give you that idea, what you need, is a conducive environment that allows people to open themselves and they can contribute. This is where psychological safety comes into play and forms the first step to creating creativity within your organization," he added.

He also emphasised on giving people their own space and let them celebrate their failures. "We need to create a conducive environment within our organizations or wherever we are working. A place where you celebrate the failures, fail fast and learn from them. This is how we can innovate with the whole ecosystem in place," said Nagar adding that "this is how companies can have a top-down approach and then from the bottom up as well." This sort of work culture can help people to be more efficient and creative. While it is a process, he believes that India as a country should learn this art.

Speaking on how India can have an edge over countries such as China, Vietnam, and Bangladesh, Zurvan Marolia, Sr Vice President and Head of Manufacturing Council, Godrej and Boyce said, "When we look at competitiveness and the fact that India and we as a country want to make ourselves a significant global power in manufacturing, it is essential to segment the demand from manufacturing." He further states that the world and customer demand are now moving more and more towards customized demand.

"As far as mass production is concerned," Marolia states, "there are countries which have stolen a march on us but that's not the end of the race." He mentions that there is customisation, and there is one more concept which is a combination of the two, which can be referred to as Mass customisation. He believes that in both these areas, India, as a country, stands a chance of making a mark on the global manufacturing stage.

Sharing the reason why he is vouching for customisation, Marolia states that India has a good population spread and a good demographic in terms of the number of skilled engineers. "It is through customisation; the requirements can be adapted very quickly. And mass customization is an aspect of bringing design into it whereby by manufacturing standard components in a mass manner, one gets the advantage of mass production. But the non-standard combination of standard components gives you a customized product. That is an area, I believe that we need to focus on," he adds.

One of the challenges with customization, as pointed out by Marolia, is that "one must make sure that the needs of the customer are captured and brought correctly to the point of manufacture. And that the correctly manufactured product goes to the correct customer, which is a complex process." However, he states that "with digitization of systems, one can trace and track components across the manufacturing setups."

Giving his take on backward integration, Narendra Shah, Director, Bayer Vapi, said, "When we compare ourselves with China on backward integration, we are facing a huge problem. It is because we are dependent on China and that kills our speed and reliability." He suggests that "it is always better to have a backward integration facility within our country."

Shah also proposed that alike vocal for local concept, the country should also process their thoughts to think globally and act locally. This would completely change the mindset of our people in terms of quality cost and reliability. "If these two things are prioritised and at least we replicate the same within our organizations, academia, and policymakers, I think this would be another great possibility for us to reach the level of China. Maybe not immediately, but in another three to five years we can make our mark," he added.

When asked about how the pandemic has led

Zurvan Marolia, Sr Vice President and Head of Manufacturing Council, Godrej and Boyce

Anil Choudhary, Vice President - Materials, Industrial Solutions and Surface Technologies for BASF India & Whole-time Director, BASF India Ltd

to innovations in the manufacturing sector, Anil Choudhary, Vice President - Materials, Industrial Solutions and Surface Technologies for BASF India & Whole-time Director of BASF India Ltd, said, "The whole life cycle of manufacturing got impacted during COVID. Be it supply chain, raw material sourcing, production, supplies to the customers and markets, or customer service. The whole nuances of the business cycle got impacted and that pushed and forced the industry to innovate to continue the business, especially at the time, when it was seeming as if there was no end to the pandemic. And that was when the industry stood up and said okay let's face the reality and let's live with the pandemic. I must say that prompted a lot of innovation in the industry, especially in terms of digitalization."

He also mentioned that it is after the pandemic, the manufacturing sector have realised the importance of augmented reality, AI, data, and analytics. "There is lot of work going on, even now to have efficient and strong analytics of the data. If you have the right data analytics, what we can have, is a very optimized process in terms of the manufacturing, forecasting, inventory management or supply to the customers. We see that the whole value chain and the life cycle of manufacturing have become much more efficient," added Choudhary.

Recalling his experience on how augmented reality helped BASF in its operations during pandemic, Choudhary said, "We had several projects going on across the world during COVID, especially we were coming up with Green Field expansions." Further, "the company's engineering team was sitting in India, and they had to do the expansion work in Malaysia. Given there were travel restrictions, nobody could travel, and on top of that the project was getting delayed and the fear of cost escalation was looming over." Given the situation, "we took the help of augmented reality, especially the HoloLens and our engineers sitting in India coordinated with engineers and suppliers across the globe. With this we ensured that even without travelling and being over there in Malaysia the project could continue, and they finished the project in time," reminisced Choudhary.

He further stated that HoloLens has become one of the major tools with their engineering team and many travels are now curtailed because of this technology and now they are executing the projects from remote locations.

Talking about India's growth, Shishir Sharma, Chief Sales Officer, RR Kabel said, "We have been deliberating so long whether it was China or Vietnam, or anybody has done better in COVID with such a large population better than India. Probably the answer would be no. We did it, we proved it. How did it happen? When you investigate the details of it probably, we all will realize that it was Innovation at every level."

He also pointed out that the country didn't have the capacity to capture what went around with 140 crore population during COVID. However, with AI tool, Aarogya Setu, the entire population was brought to one platform. Sharma also emphasised on bringing the manufacturing industry and Academia together in a bid to propel the growth of India going forward.

Citing an example, Sharma said, "Today the population of India is 140 crores. The per capita consumption of India in electricity is probably one-ninth of that in USA or probably one fifth done in Germany." With such consumption pattern, he noted that the energy consumption is going to go double in next five years now. To cater to this need, he says that it is essential to develop the talent within.

He also pointed out that the manufacturers should reach out to the people directly who are consuming their product and the companies should take immediate feedback from them. "If we develop a system as a manufacturer of bringing the consumers closer to us, I'm pretty sure in India, we will be able to make one of the world-class best product lines and it is possible if we believe into it," he concluded.

By Aakash Minda, Executive Director, Minda Corporation

DRIVING TOWARDS A 'GREEN' FUTURE, TOGETHER

Government, Consumers, and Manufacturers Collaborate for EV Adoption in India

Aakash Minda

The Green Revolution in the 1960s was a significant event that shaped the destiny of millions of Indians through technology and innovation. A natural shapeshifter, technology is rewriting the history again. It is causing a similar disruptive revolution in the mobility sector. The current green mobility revolution has the potential to transform transportation and mitigate the impacts of climate change by reducing dependence on fossil fuels.

India is currently experiencing significant changes in its mobility landscape as it strives to become a leader in climate change mitigation efforts. As one of the world's fastest-growing economies, the country is committed to addressing the challenges posed by climate change and rapid urbanization by transitioning towards sustainable mobility.

We were ranked as one of the high performing countries for our climate change performance during the COP27 conference held last year. This commitment to shaping a sustainable future is evident through the favourable policy environment, incentives, and mobilized stakeholders driving the adoption of electric vehicles (EVs) in the country. India has the potential to become a global green mobility hub and is working towards faster adoption and transition.

However, there is still a long way to go, and it is necessary for OEMs, auto component manufacturers, and consumers to collaborate and accelerate the adoption of EVs to make this transition successful.

There are several factors that will facilitate the transition towards sustainable mobility in India. Let us take a look.

GOVERNMENT INITIATIVES BOOSTING EV ADOPTION

Multiple initiatives undertaken by the government and push to boost adoption across multi-layered mobility ecosystem is laudable.

The framework to strengthen the entire ecosystem is robust. Promotion of growing charging infrastructure, $10 billion-dollar Production-Linked Incentive (PLI) scheme encouraging semiconductors and display manufacturing in the country promoting self-reliance and indigenous manufacturing; Faster Adoption and Manufacturing of (Hybrid) & Electric Vehicles (FAME-II) scheme with a budget of INR 10,000 crore to promote EVs are a few examples which underline the sharp focus. These efforts are likely to result in a significant reduction in vehicular pollution and carbon emissions in the long run.

Besides EVs, the government is also investing in the development of smart cities with integrated public transportation systems. The National Biofuel Policy launched in 2018 promotes the use of biofuels to reduce the dependence on fossil fuels. The government has also announced Bharat Stage VI (BS VI) emission norms to reduce vehicle emissions.

The Green National Highway Corridors Project (GNHCP) in an aggregate length of 781 km to be implemented in the states of Himachal Pradesh, Rajasthan, Uttar Pradesh and Andhra Pradesh with financial assistance of World Bank is another noteworthy initiative that underscores our focus on sustainable mobility. The objective of the GNHCP is to demonstrate green and safe highways keeping in view climate resilience and the use of green technologies

This is an exemplary snapshot of Indian government's multipronged approach to promote sustainable mobility by addressing various aspects such as technology, infrastructure, and policy. The efforts are both holistic and commendable.

EVOLVED NEW AGE CONSUMER

A recent report by Bain & Company, APAC markets care about the environment as much as western markets, thanks to the new age, dynamic and

environment-conscious consumers. In India, 43 per cent of consumers rank sustainability as a top-five key purchasing criteria and 62 per cent Indian consumers are willing to spend a clear premium on sustainability products. Nearly 52 per cent of consumers plan to increase their spending on sustainable products over the next three years.

Clearly, the tipping point is fast approaching. India is at an interesting juncture with a sensitised, heterogenous set of consumers who are the driving force behind moulding and adapting to new age consumption patterns. They are committing to sustainability, making informed choices. Sustainability has left a clear, lasting imprint.

This changing mindset is bound to have a ripple effect when it comes to preferred modes of mobility and choice of vehicle which is environment friendly.

OEMS AND START-UPS: THE REAL GAMECHANGERS

India became the third largest automobile market, surpassing Japan and Germany in terms of sales.

According to the latest retail stats from Federation of Automobile Dealers Association (FADA), in the month of February, e-2W sales hit 65702 units nearly double the figure reported same time during last year.

e-3W sales hit 35667 units, up 87 per cent year-on-year as compared to 19,100 units sold in Feb 2022

In electric passenger vehicles category, February 2023 sales were up by 86 per cent at 4560 units.

This upsurge is encouraging. It is evident that both consumers and manufacturers are increasingly adopting EV technology and there is healthy competition in the category. This trend is expected to grow with awareness of the environmental benefits and the government's initiatives to promote the adoption.

The efforts of Indian OEMs to adopt more sustainable manufacturing practices are critical. Faster transition to electric, hybrid, and CNG vehicles will help with faster adoption. The reduction of environmental impact however depends not just on the end product but by making the entire manufacturing process sustainable, reducing the environmental impact.

AUTO COMPONENT PLAYERS: POWERFUL 'ALLIES' TO SUSTAINABLE MOBILITY

The responsibility to drive India's net-zero targets is collective, and the agility of players across the spectrum is crucial to achieving this goal.

The overall Indian auto components industry which accounts for 2.3 per cent of India's GDP currently, is set to become the 3rd largest globally by 2025. The $46 Bn (FY21) Auto Components industry in India is expected to grow to $200 Bn by 2026.

MASSIVE GROWTH IS ON THE HORIZON

The auto component manufacturers play a critical role in India's transition towards low-carbon strategies. As major stakeholders in the automotive industry, they have the potential to significantly influence the overall sustainability driven by the sector.

By developing and producing low-carbon technologies, adopting sustainable manufacturing practices, and promoting innovation through research and development, auto component manufacturers are already taking steps towards sustainability. Additionally, by investing in renewable energy and collaborating with national and global organizations, they can ensure that their products are best suited for electric and hybrid vehicles, thereby encouraging their adoption.

It is essential that these companies continue to focus on sustainable practices and the development of low-carbon technologies. This will not only help India achieve its net-zero targets but also contribute to building a sustainable and resilient future for the country.

LOOKING AT TRULY 'GREEN' FUTURE: COLLABORATION IS KEY!

The automotive sector in India is gearing towards 'sustainable mobility' faster than we anticipated.

India's electric Vehicles market is likely to cross one crore units annual sales by 2030, stated the Economic Survey 2022-23. It also said that EV market will create five crore direct and indirect jobs. This represents a significant increase in the adoption of EVs in the country.

Furthermore, the survey estimates that the domestic EV market is expected to grow at a compounded annual growth rate of 49 per cent between 2022 and 2030.

THIS IS JUST THE BEGINNING

The EV market in India is poised for substantial growth over the next few years. The Indian government has implemented several policies and initiatives to promote the adoption of EVs, including tax incentives and subsidies, in an effort to reduce the country's dependence on fossil fuels and combat air pollution. It is now up to the industry to take responsibility and work towards realizing the larger vision of promoting green mobility in the country.

We need to believe "together, we can" achieve the transition to green mobility in India. This will require a collective effort, with each cog moving at the same pace to ensure a smooth rollout and desired outcomes.

With the right approach, India can become a shining example of sustainable mobility for the rest of the world to follow.

DIGITAL ASSISTANCE SYSTEMS BY UNITED GRINDING

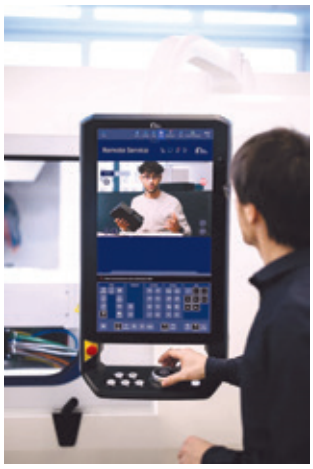
In the private sphere, digital assistance and communication systems have become indispensable. In a professional environment, even outside of the office, supporting systems are increasingly gaining equal status. As a machine tool manufacturer, the United Grinding Group offers digital products that not only make work easier for its customers but also save time and money.

What makes working on machines in an industrial facility easier? "That I can get help quickly and easily when the machine stops" could be the answer from a machine operator. A maintenance employee may say, " I have an overview of all upcoming maintenance tasks and thus no longer miss any important schedules". The answer from the production manager might be, "I can also see whether all the machines in my production are running when I'm on the road."

Different user groups have varying demands on modern production. As one of the world's leading machine tool manufacturers, the company offers digital assistance systems that make work easier for various user groups.

Remote Service

Remote Service offers uncomplicated and fast assistance, for example, in the event of machine downtime. By triggering a Service Request, customers can request quick and uncomplicated help by pressing a button. This service request can be submitted by the customer via a smartphone and the corresponding Digital Solutions app or the Customer Cockpit. With a machine equipped with modern C.O.R.E. technology, this is now even possible directly on the machine. In addition, a video conference can be conducted via the integrated camera in the C.O.R.E. panel. This again significantly increases the benefit provided by service support. The whiteboard function also makes sharing drawings and notes on



pictures or documents easy. This way, the Customer Care Team can assist remotely, saving time and money.

Service Monitor

The Service Monitor relieves those responsible for maintenance by clearly displaying all the important maintenance tasks based on the current machine's operating hours. The Service Cockpit can even be used to centrally manage, monitor, and document maintenance due dates for several connected machines. Only necessary maintenance work is displayed. Unnecessary work is thus avoided. On the other hand, the necessary work that ensures the smooth operation of a machine is not forgotten. And thanks to this optimal maintenance and care, the availability and working life of the machine are increased, which in turn has a positive effect on productivity.

Production Monitor

Production managers can monitor the production output of the machinery at any time using the Production Monitor. Production benchmarks, such as operating and non-productive times, production quantities, and downtimes, are displayed in real-time. The latest version also supports the global communication standard umati UA4MT (Universal Machine Technology Interface for Machine Tools). Not only machines from the UNITED GRINDING Group but also machines from other manufacturers can be easily integrated into the Production Monitor—from anywhere and at any time—thanks to the Digital Solution App. This overview makes it possible to discover optimization potential in the production and operation of the machines.

INOXCVA MANUFACTURES INDIA'S FIRST INDIGENOUSLY DESIGNED 4K HELIUM CRYOSTAT

Indian multinational and one of the world's leading Cryogenic Liquid Storage, Distribution, and Re-Gas solutions provider, INOXCVA, has achieved a significant milestone by completing the fabrication of India's first indigenously designed zero-boil-off 4K helium cryostat for a whole-body 1.5T Superconducting MRI magnet system. The fabrication of the MRI cryostat was carried out at their state-of-the-art facilities in Vadodara, Gujarat. The introduction of this technology would lead to the lowering of MRI expenses, therefore making healthcare more affordable in India. With the significant milestone coinciding with the celebration of Amritkaal, commemorating 75 years of independence, the MRI magnet system has been named I-Amrit 1.5, i.e. Indian Advanced MRI Technology 1.5.

The cryostat was indigenously designed by a team of scientists, engineers, and research fellows led by Dr. Soumen Kar, Principle Investigator of the Indigenous Magnetic Resonance Imaging (IMRI) project at the Inter-University Accelerator Centre (IUAC), New Delhi. The prestigious national project on the development of Magnetic Resonance Imaging, a national mission, was initiated under the leadership of Rajesh Harsh, Chief Investigator, IMRI project, at SAMEER (Society for Applied Microwave Electronics Engineering & Research), Mumbai, in collaboration with IUAC, Centre for Development of Advanced Computing (C-DAC),

and funded by the Ministry of Electronics and IT.

WORLD'S FIRST CABLE FOR HANGING APPLICATIONS SUITABLE FOR SEW-EURODRIVE

Machines have to work reliably around the clock in such areas as material handling. Warehouses are getting bigger, and increasing mast heights mean high demands on the cables. To ensure trouble-free operation even in demanding hanging applications, igus has developed the CFSPECIAL.192 hybrid cable. It is the only cable on the market specifically for hanging applications in e-chains, suitable for SEW-EURODRIVE's MOVILINK DDI. A high-tensile aramid support element in the cable jacket allows mast heights five times that of standard cables.

With 1,354 cable types for data, bus and hybrid systems, control systems and drives, igus offers an extensive range of cables for moving applications in a wide variety of industries. igus has developed the chainflex CFSPECIAL cable series for areas of application with special requirements. The CFSPECIAL.192 is new to the product range. It is the first chainflex hybrid cable for hanging applications, suitable for SEW-EURODRIVE's MOVILINK DDI drive technology.

"Hybrid technology is becoming more and more popular. So the demand for new single-cable solutions is also growing," says Rainer Rössel, Head of Business Unit chainflex Cables at igus. "Especially in the material handling field, many companies use SEW-EURODRIVE's MOVILINK DDI digital motor interface, for which we already offer various cables. Hanging applications, however, such as stacker cranes, whose masts can be very high, place special demands on cables. The CFSPECIAL.192 is our newly developed cable solution for stroke heights of up to 50 metres."

More than 4,200 newtons of tensile force

"The challenge with hanging applications is that you need a cable that is suitable for chains and can absorb enough tensile force that it does not break even over great distances and stroke heights," explains Christian Strauch, Industry Manager Material Handling at igus. The cable has to bear its weight - 15 newtons per square millimetre of the main core according to the standard. The cross-section can be enlarged, but that does not automatically mean more cable length because the coefficient of friction also increases. "To solve this problem, we have incorporated a high-tensile aramid braid into the CFSPECIAL.192's PUR outer jacket. Tests in our in-house laboratory show that the tensile strength is 500 per cent higher than that of a standard cable for MOVILINK DDI," says Rössel. "Our new cable achieves a tensile force of over 4,200 newtons, making it ideal for vertical applications, such as storage and retrieval units."

Lower costs and guaranteed longer service life

The new igus hybrid cable reduces costs for customers by eliminating the need for a second cable and time-consuming cable bracing in the energy chain. At the same time, the single-cable solution requires less installation space and reduces the weight the system must bear. In addition to lower costs, users benefit from the much longer cable service life in hanging applications. All igus cables are subjected to numerous tests to calculate the service life of each cable - and the online tool makes it very easy. "That is why we are the only supplier in the world to offer a 36-month guarantee on all our chainflex cables," says Rössel. "This way, users benefit from a durable solution that ensures reliable, trouble-free operation even at great heights and over long distances.

UPDATE

TENABLE CHOSEN BY WÄRTSILÄ TO SOLVE OPERATIONAL TECHNOLOGY ASSET MANAGEMENT CHALLENGES

Tenable®, the Exposure Management company, has confirmed that Wärtsilä has selected Tenable OT Security™ to manage its operational technology (OT) asset inventory collection and provide holistic visibility into its OT environment. The deployment allows Wärtsilä to answer its customers' questions around asset delivery, reducing supply chain risks and taking a proactive stance on cybersecurity. Wärtsilä will extend the Tenable solution to its customers, allowing them to visualize their own OT environments.

Wärtsilä is a global leader in innovative technologies and lifecycle solutions for the marine and energy markets and was seeking to address three key challenges: Automated asset inventory collection, Compliance reporting — IEC 62443, etc and OT vulnerability reporting.

Previously, this information was collected manually with the data being reported using spreadsheets. This process was time consuming and susceptible to errors and the data could have inconsistencies both in the way it was collected and reported.

With Tenable OT Security, an industrial security solution for the modern industrial enterprise, Wärtsilä can identify assets, communicate risk, and prioritize action all while enabling its IT, security, and OT teams to work better together.

ISCAR'S FACE & SHOULDERS MILLS

The world of metalworking is undergoing major changes. Complex machining processes are unimaginable without the utilization of face milling operations. Face milling processes facilitate the preparation of datum surfaces by producing planes and flats and enable improving precision and surface quality parameters. Moreover, the production of many rotating parts is incomplete without face milling. Face milling is the very operation that cannot be undermined.

In face milling, the axis of a cutter is normal to the machined surface. A large majority of face mills or surface milling cutters are common indexable tools in shell mill configuration. They feature various tool cutting edge angles (entering angles) such as 45°, 60°, 65°, 75°, 90°. Face mills intended specifically for productive rough machining by use of high feed milling (HFM) methods have a significantly smaller cutting-edge angle, typically 10°-17°. In some cases, shell mills that mount round inserts enable extremely strong cutting edges. The cutting-edge angle has an impact on the decomposition of the cutting force, which acts on the plane of the cutter axis, on radial and axial components referred to as radial, and axial cutting forces. With all else being equal, this angle defines the maximum depth of cut. The cutting-edge angle largely determines the application field of a face mill making 45° face mills most versatile. Such mills have an important advantage that stipulates a first-choice selection of 45° cutters in face milling, specifically when machining open plane surfaces. These cutters assure a good balance of radial and axial cutting forces, a high-quality machined surface, and favorable cutting conditions when a tool enters or exits the material being machined. The most common face mill types are 45° cutters.

However, 45° face mills have certain disadvantages with an emphasis on forming rectangular profiles. Although machining square shoulders characterizes end milling applications, there is a need for rectangular profiles as well. All plane surfaces of a machined part are bound by shoulders. Applying 45° face mills even when cutting near to shoulders may entail difficulties. Face mills with 90° cutting edge angles are regularly in demand for rectangular profiles. In addition, 90° tools assure low axial forces providing good reason for machining parts with thin-walled structures or cutting under poor clamping conditions. Beyond that, inserts for 90° face mills provide a higher depth of cut when compared to the same-size inserts, intended for 90° endmills.

The correct and sensible method to design 90° face mills utilizes the same inserts that are intended for 90° endmills. This concept provides high insert versatility and remains prevalent. To ensure a good surface finish, the inserts of large diameter multitoothed indexable face mills should be designed with a wiper flat that is significantly larger compared to an endmill, which is characterized by fewer teeth. Tool manufacturers maintain various principles in their developments which focus on productivity solutions, shoulder profile accuracy, and the efficient utilization of tungsten carbide being the main material of indexable inserts.

Figure 1

Figure 2

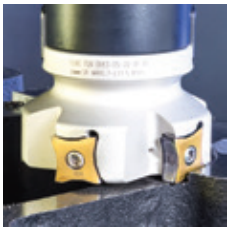


Figure 3

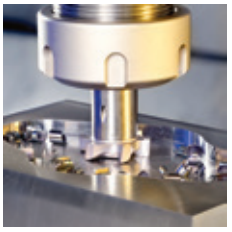


Figure 4

NEODO S90° is a family of 90° face mills that mount 8 mm double-sided square carbide inserts *(Fig. 1)*. This family of inserts is intended for rough and semi-finish machining of steel and cast iron. The double-sided insert concept shows a durable insert structure and facilitates 8 indexable cutting edges. The insert may appear simple, but when looking closely, the insert side surface features a complex shape that provides a wide wiper flat on every cutting edge. The face mills have a positive radial and negative rake angle and ensure an exact 90° profile when milling with depths of cut up to 5 mm. The NEODO S90° cutters enable face and shoulder milling while providing an additional option for machining close to shoulders where workpieces or work holding fixtures entail constraints.

In small tool diameter ranges between 32-63 mm, ISCAR introduces a family of the HELIDO Trigon Line *(Fig. 2)*. This family of tools is characterized by high-tooth density face mills with double-sided trigon-shaped inserts for true 90° profiles at a depth of cut up to 4 mm for ultra-high productivity. The insert's trigon shape provides 6 indexable cutting edges and forms positive tool rakes in both radial and axial directions. Combined with a wide wiper flat, the insert's design contributes to an improved surface finish and easily performs ramp-down milling.

LOQIQ-8-TANG face mills *(Fig. 3)* mount tangentially clamped inserts with 8 cutting edges and provide a cost-beneficial solution for rough machining planed surfaces near square shoulders. The tangential insert mounting concept combined with a dovetail clamping principle and a durable insert structure results in a strong and rigid tool design to withstand heavy loads in roughing applications.

ISCAR has upgraded the HELIQUAD family of 90° mills with traditionally designed single-sided square inserts. Specifically, the new inserts are intended for machining titanium and heat-resistant superalloys (HTSA), especially when milling near-to-shoulder faces.

In milling applications that require small tool diameters, MULTI-MASTER solid carbide exchangeable face milling heads in diameters of 12-25 mm can provide effective results *(Fig. 4)*. Due to the multi-tooth design, the heads guarantee productive cutting at high feed speeds. An important advantage of this unique face milling head is its high precision attributes, which are comparable with those of solid carbide tools. Such precision levels result in increased machining accuracy and excellent surface finish.

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