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IS GREEN HYDROGEN THE FUTURE FUEL OF INDIA?

The announcement of the National Green Hydrogen Mission last week is poised to be a watershed moment for India's decarbonisation journey and reinforce the commitment to decarbonising its industry, energy and heavy mobility sectors. Besides the pursuit to decarbonise the hard-to-abate industrial sectors, India also aims to reduce its reliance on imported fossil fuels, create employment opportunities along the hydrogen value chain, and further develop the nation's technology and innovation ecosystem through the mission.

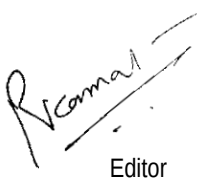
BESS and Green Hydrogen are the natural progressions in India's Net Zero and Decarbonization Journey, and consequently, the next growth opportunity. The same is reflected in recent announcements from the GOI and major industry leaders in the RE space. The government of India's approving the much-awaited National Green Hydrogen Mission, with an outlay of Rs 19,744 crore will be a critical enabler to make India a global leader in Green Hydrogen Production as well as export.

India's Green Hydrogen production capacity is likely to reach at least 5 MMT per annum, with an associated renewable energy capacity addition of about 125 GW. The targets by 2030 are likely to bring in over Rs 8 lakh crore investments and create over 6 lakh jobs. Nearly 50 MMT per annum of CO_2 emissions are expected to be averted by 2030.

The manufacture of electrolysers presents a huge opportunity for MSMEs in the country to participate in the supply chain as the adoption of Green Hydrogen increases in the big corporates which also becomes essential to engage small and medium enterprises (SMEs) to be a part of the process

While the finer details of the SIGHT program are yet to be released, we are hopeful that the initiative shown by the GOI through this move is reflected on the ground through quick and effective implementation of a policy framework to support the fledgling Green Hydrogen Ecosystem and transform India into a Global Green Hydrogen Hub as there is ample availability of renewable energy which gives the country an inherent advantage.

That said, our 18th anniversary edition is something to look forward to. In this edition, we have covered India's drone disruptor, IdeaForge, and its journey from nowhere to now being the largest player, market share wise. Furthermore, readers will find in-depth coverage of the metal cutting and forming industry, as well as interactions with industry insiders. That said, readers can also find a helpful analysis on how the capital goods sector has witnessed strong order inflow momentum in the past 12–18 months.



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Ashok Leyland Appoints Shenu Agarwal as MD & CEO

SHENU AGRAWAL, appointed as MD & CEO, will drive the technology development, growth, and future strategy for India's leading commercial vehicle manufacturing company.

Ashok Leyland, one of India's leading commercial vehicle manufacturers and the Indian flagship company of the Hinduja group, has appointed Shenu Agarwal as the Managing Director & CEO with immediate effect.

Assuming charge, Agarwal will guide the technology development, growth, and future strategy for the company to achieve the vision of being among the top 10 commercial vehicle players globally. Prior to taking over, Agarwal was the President of Escorts Kubota Ltd. Having been the President for the agribusiness for more than seven years, he closely associated with the transformation of the company into a leadership position by ushering in contemporary global standards of design, quality, and manufacturing.

Dheeraj Hinduja, Executive Chairman, Ashok Leyland, said, "Agarwal has a proven track record as a leader from a business conglomerate and is an all-rounder having worked in different capacities in many disciplines. Our focus on reliability, ambition to achieve global scale, and our constant pursuit of enhancing stakeholder value at Ashok Leyland all will get further strengthened with Shenu at the helm. I am optimistic that the company will carve new niches in the mobility sector soon under his stewardship and I wish him the very best for the future."

LAPP India Inaugurates New Service Point in Gujarat

LAPP INDIA has inaugurated its fourth service point in Baroda, Gujarat to provide customised solutions to customers. Gary Bateman, MD, LAPP India inaugurated the facility along with the leadership team.

Covering 16,000 sq. feet, the facility is equipped with the latest machinery, and trained manpower and specialises in producing harness solutions concerning automation, OEM and renewable energy. It offers a sales point to meet the MRO requirements of the growing customer base in Gujarat. This service point has facilities to manufacture all types of harnesses with/without over moulding requirements, single-core wires, multicore cables, flat/bonded/ ribbon cables from 50 MM to 50+ mts as well as customised harnesses depending on the customers' needs. It includes machines for cable assembly and testing as well.

Ecoclean Sets Up New Test Centre For High-purity Cleaning Applications

ECOCLEAN INVESTED around £4 million in building its new High Purity Test Centre that works well with the company's 15 existing technology centres in the high-purity sector. The facility, which was officially inaugurated at its German production site in Dettingen unter Teck at the end of November 2022, will conduct cleaning trials on high-tech components with the highest cleanliness requirements.

New products and services continue to add to Ecoclean GmbH's portfolio, keeping in mind the changing and sector-specific requirements in industrial parts cleaning. These include cleaning machines and systems specially designed for high-purity cleaning, where extremely high cleanliness requirements for metallic and optical components must be reliably met.

The new test centre comprises five cleaning systems to serve for high-purity cleaning tasks. These systems cover all the technologies, media and processes needed for wet-chemical parts cleanings, such as ultrasonics, injection flood washing, plasma cleaning, pulsed pressure cleaning (PPC) and Ultrasonics Plus.

The centre has two cleaning areas, each with different cleanliness classes. The first one is in a clean room that contains both a solvent-based chamber cleaning machine with integrated low-pressure plasma cleaning and a chamber-type machine for aqueous media. This area is used for pre-cleaning tasks, which prepare parts for final cleaning in the clean-room environment. It is also suitable for meeting the higher cleanliness requirements of a variety of typical ultra-fine cleaning tasks found in sectors such as the sensor, aviation, e-mobility and coating industries.

The final cleaning area is in a validated ISO Class 7 clean room with ISO Class 6 zones. This contains a chamber-type washer for solvent media, a chamber-type washer for water-based media, and a multi-chamber ultrasonic cleaning system with nine wet and two dry stations. Here, different ultrasonic frequencies, cleaning chemicals, PPC, passivation agents and more can be tested. A range of (combinable) options is also available for drying parts.

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Piaggio Vehicles Launches Two New Electric 3-wheelers

PIAGGIO VEHICLES (PVPL) launched two new electric three-wheelers: Apé E-City FX Max in the passenger segment and Apé E-Xtra FX Max in the cargo segment.

The new vehicles were unveiled by Vincenzo de Luca, Ambassador of Italy to India. Diego Graffi, Chairman & MD, Piaggio Vehicles, and Sudhanshu Agrawal, EVP & Business Head - Electric Vehicles &Exports, Piaggio Vehicles along with invited Government of India dignitaries were also present during the launch. In addition, Piaggio Vehicles signed Memorandum of Understanding (MoU) with key industry partners to ensure continued strides in building a robust EV infrastructure in India.

The new variants, Apé E-City FX Max and Apé E-Xtra FX Max have a superior driving range, 12 inch tyre size offering better ground clearance, control over rough roads, and improved grade ability among other advancements. This EV range is assembled by an all-women team at Piaggio'sBaramati factory. Apé E-City FX Max and Apé E-Xtra FX Max is available as a fixed battery solution with a new bezel and graphics. A swappable battery solution for the new FX Max will also be available soon.

The new Apé FX Max range provides long battery performance, enhanced earnings at an effective cost. The vehicles also have a reserve range of up to 5 kms to combat range anxiety. The vehicle's seat height has also been adjusted for better driving visibility and control. Advanced telematics 2.0 gives drivers better navigation and allows fleet owners to track and manage the fleet.

Piaggio Vehicles signed MoUs with key EV players like SUN Mobility, Three Wheels United, Zyngo, City Link, Amplus Solar, Magenta Mobility, MoEVing, and MBSI at the launch event. These MoUs ensure to deliver 24,000 commercial EVs in a phased manner across India in 2023. Of these, over 10,000 will be deployed in partnership with SUN Mobility for both cargo and passenger segments in more than 14 Indian cities. Piaggio India is also partnering with Three Wheels United with their retail finance scheme for both passenger and cargo vehicles.

Servotech-NSEFI JV To Install Solar-powered EV Charging Carport

SERVOTECH POWER SYSTEMS has signed an agreement with the National Solar Energy Federation of India (NSEFI), to implement a solar-powered EV charger-enabled carport as part of a pilot demonstration.

As part of the project, NSEFI has afforded Servotech a whitespace to showcase its solar and EV charging capabilities blended together in one innovation. The carport will be installed at the Ministry of New and Renewable Energy's (MNRE) premises in Delhi, further helping to replicate the setup at other strategic locations.

The project will involve Servotech carrying out the design, fabrication, and installation of PV plus storage carports with EV charging capabilities, adding a 5kW solar system, equipped with two DC fast EV chargers of 11kW each. Designed to cover a range of automobile parking places, solar carports can also be personalised, from rainwater collection to business branding. Further, the solar carports appreciate the property value, offering the site owners to earn secondary revenue.

Delhi has already rolled out electric buses aiming to limit the pollution problem. This project will encourage green mobility alternatives in the state and develop a climate-resilient, carbon-neutral transportation ecosystem, driving travellers towards the adoption of electric vehicles.

Appreciating the opportunity by the NSEFI, Sarika Bhatia, Whole-Time Director, Servotech Power Systems, commented, "Delhi has long been known for its highly adaptive, embracing ecosystem, and the carport, installed right in the MNRE complex can serve as a lighthouse example, making a real statement on sustainability. With coordinated efforts from all stakeholders, we intend to implement renewable, energy efficiency, and electric mobility projects that will go a long way in unlocking the best that clean power generation has to offer."

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Revfin Ventures Into EV Leasing In Delhi

REVFIN SERVICES, an advanced digital consumer lending platform launched its #RevFinBharatYatra campaign by foraying into the EV leasing business in Delhi.

Through its campaign, Revfin targets financing two million electric vehicles in the next five years, registers itself in new states and has footprints in 50 cities with 1000 dealers and targets adding 10,000 new customers. It also targets initiating five new partnerships in different forms of mobility, like 2W, 3W, 4W, with e-commerce and other last-mile connectivity operators. The campaign not only expands geographical footprints but also explores and ventures into different options for financing electric vehicles.

Revfin has signed a deal with Zyngo EV Mobility Private Limited to finance and lease 25+ L5 3-Wheelers and 200+ high-speed 2-Wheelers in the next three months in Delhi and Bangalore, achieving (executing) hyper-local deliveries and working towards transforming the face of mobility.

With this new leasing vertical, Revfin Services Private Limited aims at driving the logistics towards sustainability and revolutionising mid-mile and last-mile deliveries for which 25 EVs have been deployed in Delhi so far. The leased vehicle would be available for up to three years, thus offering easy ownership and preference for personalised services resulting in better customer engagement.

So far, Revfin has already disbursed over $18 million to fund over 13,000 electric vehicles in 15 states with 550+ dealerships and 10+ top original equipment manufacturers (OEMs). Having recently closed $10 million in Series A funding, the company plans to utilise it to capture over a 10 per cent share of the financed electric three-wheeler market in 50 cities and diversify its business in other segments like two-wheelers for last-mile deliveries, and four-wheelers for mid mile cargo delivery and rideshare taxis.

TVS Motor Company Awarded At FICCI CSR Summit

RECENTLY, TVS MOTOR COMPANY was awarded at the Federation of Indian Chambers of Commerce & Industry (FICCI) CSR Summit and Awards 2022, under the category "Fight against COVID-19" for their contribution towards the community through their CSR wing, Srinivasan Services Trust (SST), during the pandemic, especially in rural India.

Attending the ceremony at the FICCI Federation House in New Delhi, Swaran Singh IAS (R), Chairman, Srinivasan Services Trust, said, "Over Rs 85 crores have been contributed by TVS Motor Company towards COVID relief. Procurement and distribution of essential medical equipment and medicines, spraying of disinfectant in villages and cities, life-saving oxygen concentrators and High Flow Nasal Oxygen (HFNO) machines, lakhs of food packets and much more were provided to the rural hospitals and communities. SST provided assistance to 525 rural primary health centres and hospitals to ensure that far-flung rural communities have access to essential medical items on a priority. Apart from this, Rajiv Gandhi & Stanley Government Hospitals at Chennai were provided full support during the pandemic with the aim to save thousands of lives."

Over the last twenty-five years, SST, with the help of TVS Motor Company, has been actively facilitating sustainable and self-reliant development across 2,500 villages in India, bringing a paradigm of holistic and sustained socio-economic change at the grassroots level across India.

EVM Launches 3-in-1 Wireless Charging Pad 'EnPad'

HUNDIA INFO SOLUTIONS, the brand owners of EVM, welcomed its newest offering - the 'EnPad' 3-in-1 Wireless Charging Pad. All wireless charging devices for Android and iOS as well as for Qi-enabled devices are supported by the 15W fast wireless charging which is significantly faster compared to other market options. It charges phones with casings that are up to five millimetres thick.

EVM 'EnPad' has features like automated temperature control and input overvoltage prevention and offers a clean, minimalist appearance and a rubberised texture. It has a specialised charging module to power your smartwatch. It can charge both mobile device and TWS device at the same time. Additionally, it enables rapid charging inputs like QC and PD.

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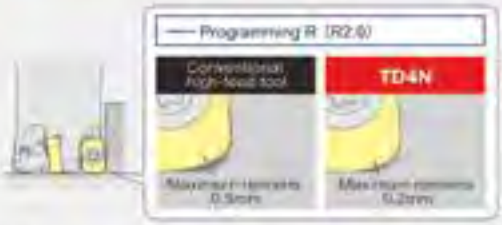

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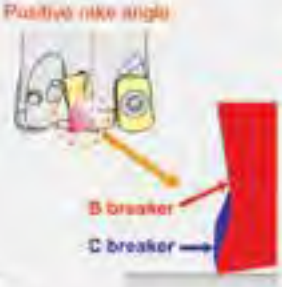

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By Abhilash Purushothaman, Regional Vice President, Cisco AppDynamics

PREPARING FOR NEXT ERA OF INNOVATION

Cloud-native technologies coming into play has opened up avenues for the manufacturing industry to invent and innovate. The article throws light on the impact of cloud on manufacturing and the momentum it can set in.

India's manufacturing industry has made significant strides in 2022. Data for October showed that the sector was expanding at a rapid and robust pace, the seasonally-adjusted S&P Global India Manufacturing Purchasing Managers' Index (PMI) was up from 55.1 in September to 55.3 in October. And this is part of an 18-month upward trend. This growth has translated into additional work and a strong rise in manufacturing employment.

Abhilash Purushothaman

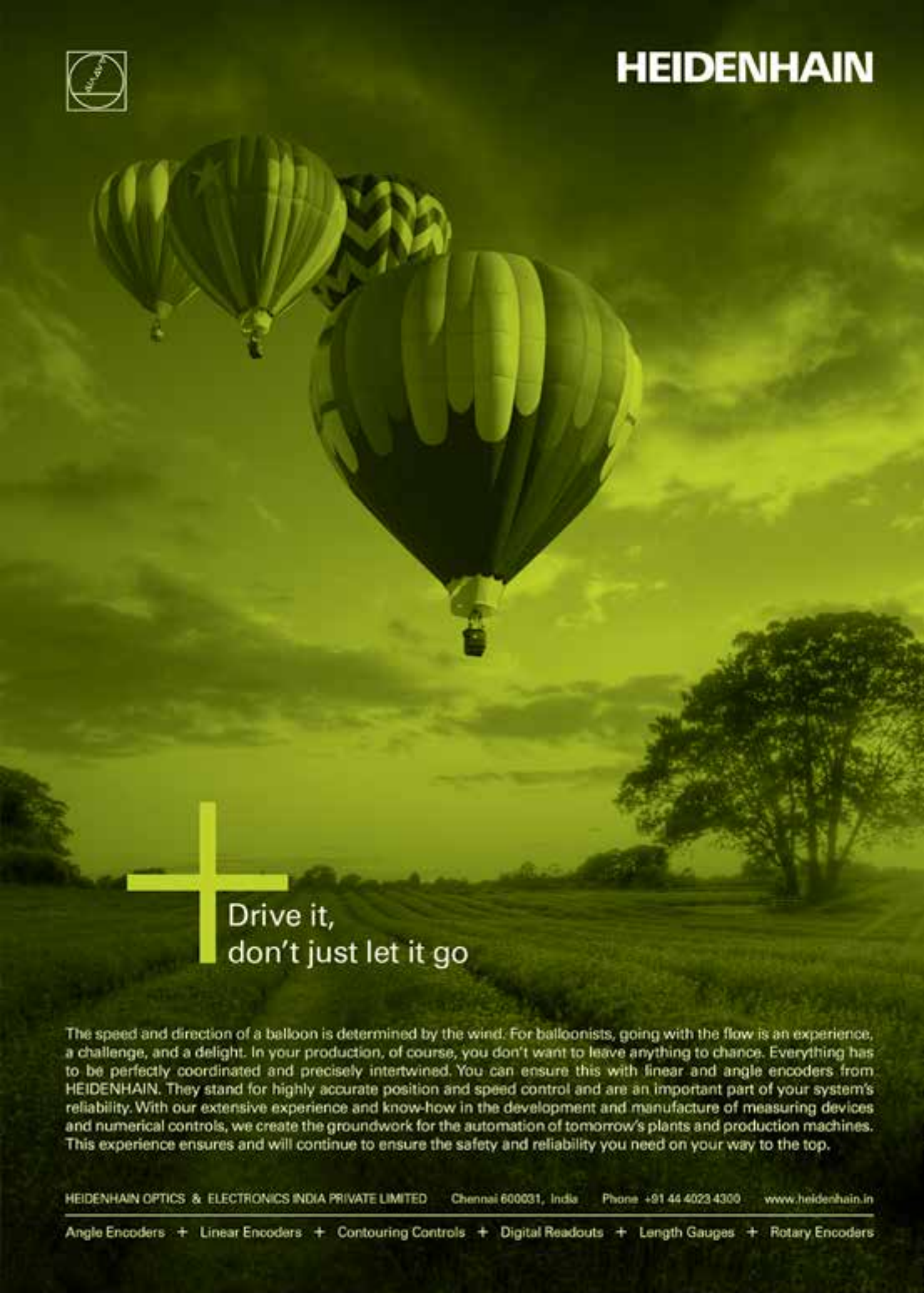
Against this backdrop, how are organisations within the market adapting their business models and processes to sustain this added demand? Ramping up digital transformation initiatives is certainly a critical component to embedding greater agility and flexibility into operations and responding to changing customer needs.

More specifically, the move to cloud-native technologies is enabling a new wave of innovation in the industry. Organisations are moving towards a modern application stack to increase development velocity and deliver more intuitive and personalised digital experiences to customers and employees.

But this process cannot be rushed, and manufacturers mustn't overlook the need to equip their technologists with the tools and insights required to deliver accelerated innovation. They must ensure that their IT teams have a full and unified visibility into dynamic cloud-native environments so that they can manage and optimise IT availability and performance at all times. It allows technologists to move beyond the firefighting to take a more proactive and sustainable approach to innovation.

TECHNOLOGISTS FEEL POSITIVE EVEN THOUGH JOB IS HARDER

A lot changed for technologists in the manufacturing industry over the last few years. Operating under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relentless pressure to deliver innovation at speed, technologists have had to pivot time and time again to respond to constantly changing business needs. They've had to move critical operations online, digitise large parts of their organisations and enable wholesale remote and hybrid work. Additionally, there were heightened security risks, budgetary pressures and soaring levels of complexity across an ever more fragmented IT environment.

It's perhaps unsurprising, that the latest research from Cisco AppDynamics, the 'Agents of Transformation 2022' report, finds that 96 per cent of technologists working in the manufacturing industry feel that the last four years have altered what it means to be a technologist, and changed what is required to deliver seamless digital experiences in a world where hybrid work environments are becoming more commonplace. The seismic shifts and the intense pressure they're under, research show they have a strong sense of optimism. They feel proud of their achievements and contribution during the pandemic and are excited about the future. They've proven their value to their organisations and built credibility and influence. 93 per cent say that they consider themselves to be business leaders within their organisations, higher than their counterparts in any other sector.

Over the last six months, technologists have recognised the need to adapt their approach to a post-pandemic scenario and switch to a more proactive and strategic mode of operating. Only 18 per cent of technologists in the sector feel that their IT department is still in a reactive, firefighting mode following the pandemic, lower than any other industry. Most IT teams in the industry are either already in the strategic mode or are transitioning to get there.

> "Operating under relentless pressure to deliver innovation at speed, technologists have had to pivot time and time again to respond to constantly changing business needs. They've had to move critical operations online, digitise large parts of their organisations and enable wholesale remote and hybrid work.

RE-IMAGINING APPLICATIONS TO MEET CUSTOMER NEEDS

The unrelenting appetite for digital transformation within manufacturing organisations is the key driver for this change. The pace of innovation in the industry continues to accelerate as businesses look to drive competitive advantage by delivering better and seamless digital experiences.

Manufacturers recognise that they will need to completely re-imagine their applications over the next 12 months to meet the evolving needs of both customers and employees. The move to cloud-native applications and infrastructure we're now witnessing is a major part of this approach. Modern application stacks provide a platform to dramatically accelerate application development velocity and to embed far greater agility and resilience into operations.

In order to reap the benefits of cloud-native technologies, manufacturers will have to invest in a number of critical areas – including application security, network monitoring and end user monitoring.

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Given this challenge, technologists recognise an urgent need to generate full and unified visibility of their entire IT environment (including cloud, hybrid and on premise). They know that this would be favourable to them to manage and optimise IT availability and performance at all times and deliver the seamless digital experiences that customers and employees now demand.

They will also need to focus on observing cloud-native applications and infrastructure.

OBSERVING CLOUD-NATIVE TECHNOLOGIES

The Agents of Transformation 2022 research highlights an urgent need for better visibility into the availability and performance within cloud-native technologies. More than half of the technologists surveyed feel overwhelmed by complexity and data noise, and they're acutely aware that this problem is set to become worse as they transition to dynamic and highly volatile cloud-native technologies. These systems rely on thousands of containers and spawn a massive volume of metrics, events, logs and traces (MELT) telemetry every second.

Most technologists simply don't have a way to cut through this data noise while troubleshooting application availability and performance issues caused by infrastructure-related issues in hybrid cloud environments.

Given this challenge, technologists recognise an urgent need to generate full and unified visibility of their entire IT environment (including cloud, hybrid and on premise). They know that this would be favourable to them to manage and optimise IT availability and performance at all times and deliver the seamless digital experiences that customers and employees now demand.

Additionally, IT teams should also ensure that they're able to link IT performance data to real-time business metrics so that they can cut through the noise and identify and prioritise those issues proactively before they could impact the end user's digital experience.

87 per cent of technologists in the manufacturing industry are viewing full-stack observability as critical to sustainable transformation and innovation in their organisations, higher than any other sector. It demonstrates the extent to which they are taking a proactive and strategic approach to innovation and looking to future-proof their organisations' digital transformation programs.

The shift to cloud-native technologies undoubtedly signals the start of the new era of innovation in manufacturing, where organisations will move at breakneck speed to take advantage of new opportunities and react to evolving customer needs. It's therefore crucial that IT teams have access to the data and insights required to maximise the benefits of these cloud-native technologies. With a business lens on IT availability and performance across their IT environments, technologists can drive game-changing innovation and continue to build on the momentum in manufacturing IT.

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By Sougandh K M, Country Manager of India, Universal Robots

COBOTS: BREAKING THE BARRIERS

The article explains how cobots present lucrative opportunities for car and automotive component makers and have become an ideal solution to assist manufacturers in ensuring operations continue to run smoothly.

In the manufacturing industry, robotics and automation are not new phenomena. However, with the advancements in technology, the growth in the adoption of robots in the automotive sectors has been witnessed across the globe. Over the years, robotics technology has evolved. Unlike the large and bulky machines often used in factories, robots are now available in compact sizes. Instead of integrating traditional industrial robots, manufacturers are introducing collaborative robots or in short "cobots" to automate their processes.

Cobots have presented lucrative opportunities for car and automotive component makers. For decades, the automotive industry has been dependent on manual labour. For countries facing labour shortage challenges, cobots have become an ideal solution to assist manufacturers in ensuring operations continue to run smoothly despite the lack of manpower. The processes in automotive manufacturing are repetitive and require accuracy. Human employees were tasked to work on such dull and monotonous activities. After working repetitively for a prolonged period, the level of precision and concentration declines, resulting in human errors or even product defects. Cobots are recognised for their ability to conduct tasks with precision. Unlike humans, cobots are capable of working 24/7 round the clock with precision and consistent productivity.

Sougandh K M

In addition, manufacturers who deployed traditional industrial robots are required to accommodate additional spaces for the integration of safety cages and fences. However, cobots are designed to work alongside human employees without safety cages (subjected to risk assessment). Hence, car makers need not invest hefty sums for the reconstruction of their factory infrastructure to integrate a cobot.

Since the adoption of automation, the automotive industry has seen tremendous growth. A Mordor Intelligence report revealed that the automotive robotics

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market was valued at $9.92 billion in 2021, and is anticipated to reach $18.15 billion by 2027, at a CAGR of 10.60 per cent during the forecast period (2022 – 2027).

ASSEMBLY

Cobots are often used in the assembly processes of the automotive industry. Cobots automate the processes such as lifting and placing roofs, seats or doors of the cars and attaching windshield wipers or wheel mounting. All these processes are conducted by robotic arms at high speed. Light processes such as screw driving and motor pumping are conducted by light arms whereas heavy processes like wheel mounting which involves heavy weightlifting are conducted by cobot's arms with higher payloads.

PAINTING

Painting robots are increasingly deployed in the automotive processes. Painting large surfaces or small components manually and consistently is a difficult task to be carried out by human workers. Additionally, automotive paint is toxic and further poses major health risks to humans. This is where cobots come in. Tasks involving large surface painting can be taken over by cobots, relieving human workers to work on higher-value tasks. Cobots' precision and consistent performance ensure the elimination of human errors, reduction of paint wastage and eventually, reduction in production costs over time.

WELDING

Welding is one of the most dangerous and time-consuming processes in the automotive industry. It requires precision and is best suited to be performed by cobots. Cobots can handle Arc, TIG, laser, MIG, ultrasonic, plasma, and spot welding, as well as soldering and brazing. Cobots can perform multiple welds in a short time with negligible errors in the process. The main benefit of cobot welding is consistency and perfection in quality. Furthermore, human errors are significantly reduced and the risk of humans getting burned is eradicated.

MACHINE TENDING

The loading and unloading of the production machine can involve dull, dirty and dangerous processes. Over the years, machine tending has emerged as one of the commonly used applications for cobots.

For instance, Bajaj Auto is among the largest auto manufacturers in the world to incorporate cobots. Bajaj is the first company to deploy cobots in their manufacturing lines in India. The company has deployed over 100 cobots from Universal Robots across their production lines to improve the productivity and efficiency of the manufacturing unit. They have deployed many cobots for machine tending in their assembly lines to ease the process of production for the workers and to speed up the production process.

MATERIAL REMOVAL AND POLISHING ROBOTS

In vehicle production, material removal and parts polishing are crucial processes. These processes include cleaning up automotive parts by metal trimming or mold polishing for smooth finishes. Similar to other processes in car manufacturing, these tasks can be repetitive and dangerous, hence, the deployment of cobots becomes essential. Cobots can assist in tasks such as grinding, deburring, milling, sanding, routing and drilling.

QUALITY INSPECTION

Maintaining the quality of products is placed a high priority for car and automotive part makers. With advanced technology, cobots are incorporated with software and hardware that sense external faults and internal faults with the help of sensors. Cobots are designed to automate quality inspection tasks such as cosmetic optical inspection and metrology.

ROBOTIC VISION

Unlike traditional robots, collaborative robots are now AI-enabled. They come with laser vision cameras and sensors to perform smallest-to-point tasks with utmost precision. Robots can sense their surroundings which gives the machines instant feedback. This feature ensures that cobots are safe to work alongside human workers (upon risk assessment) and significantly reduces human errors.

The deployment of cobots in the automotive and manufacturing sectors offers benefits such as increased productivity, enhanced safety and potentially reduce production costs. Cobots are capable of repeating tasks without diminishing the quality, ensuring a decline in human errors. Cobots are safe to be used alongside humans without the threat of causing possible injuries while performing the task. Cobots relieve humans from conducting repetitive tasks so that human workers can focus on creative and innovative tasks.

Cobots in automotive industries are an easy automation solution for manufacturers. Due to the growing demand for cars across the globe, the demand for robotics to perform various automotive tasks is also increasing. Now, consumers are seeking customisation in commercial vehicles. With greater requirements from end-users, cobots have become a flexible approach for manufacturers to meet and adapt to these increasing demands.

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By Sachin Bhalla, VP – Secure Power Division, India and SAARC, Schneider Electric

USING DATA FOR AUTOMOTIVE ASSISTANCE

Edge computing is being explored and adopted within the automotive industry to support the increasingly complex software being deployed in cars. The article explains how industrial edge computing unlocks data, the potential for automotive companies.

Sachin Bhalla

The automobile sector in India is valued at more than $100 billion, produces 8 per cent of the total exports made by the nation and makes up 2.3 per cent of India's GDP. The introduction of AI has changed the way things are. It's difficult to avoid the conversation about partially or completely driverless vehicles powered by artificial intelligence these days (AI). Both sceptics and supporters of major innovations in the automotive industry have strong views on their advantages, disadvantages, and prospects for the future.

Edge computing is being explored and adopted within the automotive industry to support the increasingly complex software being deployed in cars. Edge computing offers the automobile sector a way to overcome issues with latency, bandwidth, and autonomy, as well as security and legal regulations that prevent us from fully utilising data. Automotive players may use their data in real-time by using the industrial edge, giving them a competitive advantage that is more important than ever. If analysed near the source, Internet of Vehicles data can give businesses a competitive advantage.

Everything is guided by software, including testing, production, and in-car navigation. Between 2017 and 2024, the market for linked cars, or the Internet of Vehicles (IoV), is expected to increase by more than 200 per cent. Modern automobiles produce mountains of data at every stage of their existence, from production through decommissioning.

Manufacturers can modify processes, carry out maintenance, and make operational choices remotely thanks to data from sensors and remote management equipment installed in factories. Terabytes of test data are also collected by automakers every hour. A manufacturer's network must make quick decisions regarding the data as soon as it enters.

Even though the cloud has numerous advantages over traditional networking, there is too much latency when there is a deadline to meet. Therefore, the solution for automakers is to place IT resources closer to industrial systems so that they can store and analyse data as close to the point of production as possible.

Automakers must use industrial edge computing if they want to take advantage of this data's full potential. The term 'industrial edge computing' refers to the

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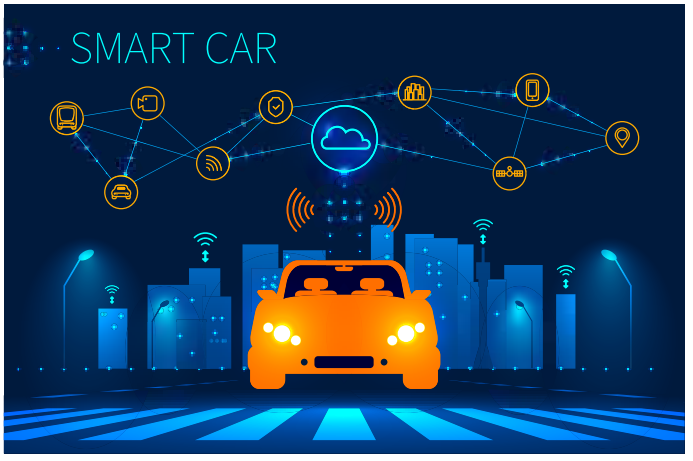

placement of computing and analysis power at the network edge in industrial contexts.

ENABLING WHAT CENTRALISED DATA STRATEGIES CANNOT

In addition to providing a foundation for latency-free analysis, industrial edge computing enables the use of tools that corporate and cloud IT setups cannot, such as video analytics and autonomous robots. The most significant advantage of edge might be its instantaneousness. But manufacturers across a range of sectors also value the convergence that industrial edge delivers.

The automotive industry needs to better grasp the industrial edge solutions that allow businesses to combine IT and OT if it is to profit fully from edge computing. To maximise a variety of operational outputs, such as sustainability, profitability, and cost, businesses typically need to examine data from business systems. Without the dedication and skill of IT professionals who are aware of network performance and security, these systems would not operate as they should. Ultimately, the automotive industry must integrate information and operational technologies as close as possible to the asset if it is to succeed in the future. Future success for the industry requires melding information and operational technology as close as possible to the asset.

SECRET TO SUCCESS AT EDGE IS RESILIENCE

Even if the advantages of edge computing are obvious, building such an infrastructure may not be. A hybrid data centre design serves as the foundation for industrial edge computing. This architecture combines three elements:

- Local edge data centres with computing and storage at the location of data generation
- Regional edge centres for large computing and storage, which are frequently located in central or urban areas
- Centralised data centres for massive computing and storage, which are typically located in remote areas

Unfortunately, not all businesses have given edge computing locations the same respect they do for central data centres. Local edge sites, however, are probably manufacturing floors, distribution centre, or even personal safety monitoring systems in the automotive industry. Unplanned downtime at a local edge site makes it difficult to supply a product or provide sufficient customer and staff experiences.

There is great potential for the automotive industry once they ensure that any industrial edge implementation is as resilient as if it were a standard central data center. Finding the correct partner to help with edge deployment is crucial because the lack of on-site IT personnel and the uneven geographic distribution of edge sites make this process more difficult. All aspects of the edge data centre lifecycle should be outsourced to partners to ensure efficient deployment and operation. All aspects of the edge data centre lifecycle should be outsourced to partners to enable efficient deployment and operation. Even at unmanned locations, solutions that are simple to integrate with current hardware and software tools and are prepared to withstand power disruptions and other outages can offer peace of mind.

UNLOCKING DATA'S POTENTIAL FOR AUTOMOTIVE COMPANIES

Processing speed and computing power are now essential components of the automotive sector. Today's automobile manufacturers are just as much software firms as they are manufacturers of durable things, thanks to developments in software and sensors that enable features like maintenance and performance warnings and parking assistance.

The auto industry still has a long way to go before converting its data into a revenue generator, in contrast to other sectors that have already made money from their shift to a software-centric model. Players in the automobile industry can gain a competitive edge in the future by utilising industrial edge computing solutions to fully utilise their data.

Players in the automobile industry can gain a competitive edge in the future by utilising industrial edge computing solutions to fully utilise their data. This is particularly important for developing IoT and IoV economies with a robust automotive sector, like India.

By Vasudeva Rao Munnaluri, RVP India & SAARC, Zendesk

THE POWER OF CX IN MODERN MANUFACTURING

The article sheds light on how delivering customer experience is the key to success for the manufacturing industry.

The manufacturing industry is no stranger to technology and innovation. For years, manufacturers have implemented the latest innovations to automate operations, collect data, and use that data to not only make better products, but to achieve optimum operational efficiency. But in the age of personalised experiences, making better products is no longer enough as a competitive differentiator.

Disruptions to global supply chains over the past two years created an involuntary push from in-person sales interactions to remote and digital self-service models. Agility and staying customer-focused reinforced the need for a collaborative approach. These changing circumstances call for manufacturers in India to purposefully shift their investments to technology and innovation that support and meet their customers where they are, focusing on how they want to be engaged. This is perhaps why 95 per cent of Indian manufacturers say CX is a competitive differentiator, according to Zendesk's CX Accelerator report.

Vasudeva Rao Munnaluri

So, how do manufacturers in India leverage CX to set themselves apart from competitors?

BREAKING DOWN DATA SILOS

Customers expect easy access to the brands they do business with. They want seamless experiences throughout their buying journey. It's why 75 per cent of manufacturers say they want to differentiate their customer experience with Industry 4.0 technologies like real-time status visibility and granular delivery times to portfolios across locations by 2024.

But a challenge that persists among manufacturers is legacy technology.

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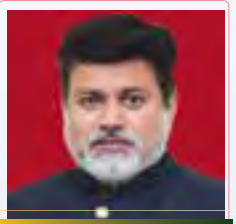

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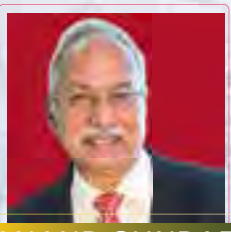

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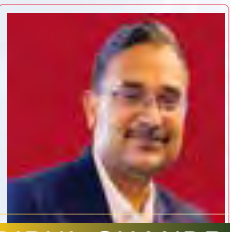

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With a unified platform, manufacturers can also predict when machines need repairs, gain visibility into the timeline of critical events concerning every asset, and proactively trigger tickets based on device status and troubleshoot equipment before it breaks.

Overhauling legacy tech solutions is necessary for teams to operate more efficiently, leverage data effectively, and stay competitive in the modern manufacturing landscape. And as a company's tech stack grows, legacy tools often struggle to integrate successfully with newer ones, creating data silos that impact the customer journey.

Customer data often comes from multiple systems. This is unavoidable as businesses rightly provide various touch points for customer interactions, allowing customers to reach out with any preferred platforms. To avoid silos, manufacturers need to connect all data sources through an open, flexible CX platform to be a single source of truth regardless of the channel. This thereby empowers sales reps and support agents to deliver the personalised, conversational experience needed to close the deal with customers and seamlessly address their queries.

With a unified platform, manufacturers can also predict when machines need repairs, gain visibility into the timeline of critical events concerning every asset, and proactively trigger tickets based on device status and troubleshoot equipment before it breaks.

LEVERAGING POWER OF AI

Technologies such as AI, machine learning (ML) and blockchain technology can help manufacturers manage strains on both products and supply chains. On the CX front, automation can be applied to workflows and processes to rule out redundant tasks, such as ticket routing, and AI-powered chatbots, can be implemented to assist with customer communications. This then frees up agents' time otherwise spent on repetitive, manual tasks to focus on higher value, complex work that requires a human touch.

Manufacturers have to manage a high volume of orders and requests coming in from multiple locations, often involving technical product information and subject matter experts from other departments that agents need to have easy access to. Gathering the people and information together manually can be a long-drawn process, especially when customers expect those assisting them to have a certain level of expertise and know-how of the products in question. CX solutions need to cater for this complexity. For example, AI can triage requests based on the expertise required and level of complexity where requests regarding a specific product can be directed to an agent with specialist knowledge of said product, while also recommending relevant help articles to the agent to better assist the customer.

Manufacturers can also leverage AI for workflow

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> The right tech stack can integrate order management systems with support workspace to reduce barriers to resolve issues and connect all parties in one conversation.

management. Manufacturers with the fastest resolution times are 2.1 times as likely to use workflow management tools. Such tools act as a centralised repository where all tasks, communications, and data can be tracked or updated. This centralisation ensures everyone across the board is on the same page so employees can swiftly resolve customer issues.

FOSTERING CUSTOMER-CENTRICITY

Customers today expect real-time support with quick solutions to complex problems. But only 23 per cent of manufacturers in India are currently meeting customer expectations, while 94 per cent say they will lose business to more customer-centric competitors if they do not improve CX capabilities. Happy customers are more likely to be loyal to the company and are likely to spend more through increased renewal rates, faster product adoption, and return business.

Becoming customer-centric is therefore a necessity and yet 56 per cent of companies in India say their senior leadership views customer service as a drag on the business. But a business without a customer-centric culture is at risk of losing out in the long run. Fostering a customer-centric culture starts with empowering staff and support teams. This translates to investments in technology that make their job easier. Tools that make room for seamless channel-switching, enhanced customer visibility, and artificial intelligence are essential for delivering great CX. Mature CX solutions allow manufacturers to tap into customer data, and turn this information into sales opportunities and ultimately, create loyal customers.

STRENGTHEN RELATIONSHIPS WITH PARTNERS

B2B partners are also ultimately customers and expect effortless experiences when making purchases. They all want efficient collaboration and convenience in the manufacturing ecosystem. But this can add significant complexity on the back end, especially for manufacturers with a huge number of customers, orders, and products. But investments into CX pay off on the bottom line. A Forrester report found that the average revenue generated from loyal customers is 50 per cent more than the average from all other customers. These tools make it easy for partners to handle customer inquiries with an extensive knowledge centre and speed-up response time with collaboration tools. The right tech stack can integrate order management systems with support workspace to reduce barriers to resolve issues and connect all parties in one conversation.

Building positive, long-term customer relationships has always been important to business success. Amid economic downturns and uncertain business environments, it is perhaps more important now than ever for manufacturing companies to invest in CX solutions that will drive better operational efficiencies, differentiate from competitors and drive growth in the long run.

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OUR PRODUCTS ARE 'BUILT LIKE A BIRD AND TESTED LIKE A TANK'

In a freewheeling interview, **Ankit Mehta, Co-founder and CEO of India's first drone disruptor tech company** talks about the idea behind building the brand – ideaForge. Edited excerpts:

By Rahul Kamat

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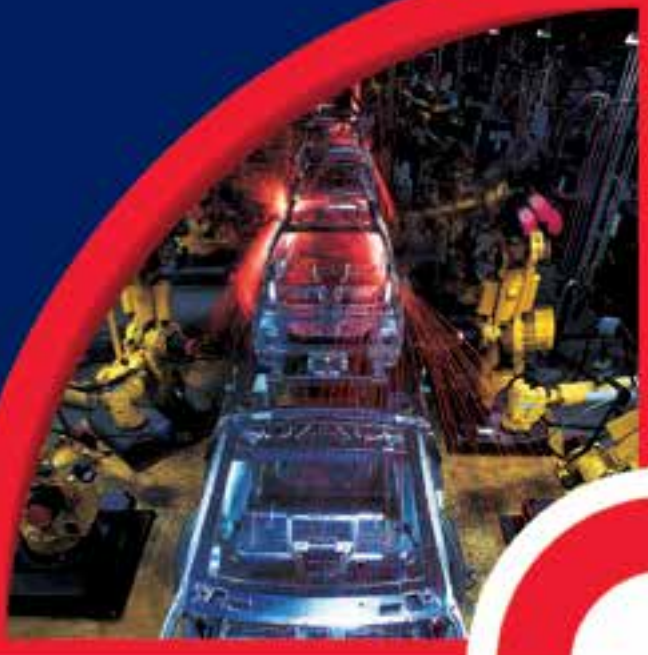

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Ankit, from where this idea of building a brand like ideaForge came to your mind?

I knew that I had a great team in the form of my co-founders. And along with that, we had done so much technical work as part of IIT Bombay, and our journey there that we used to feel like we were especially privileged to have been a part of the ecosystem that encouraged us to implement our ideas to work on our work projects.

And as against most people's excitement to work on software at that time, we somehow were those oddballs that were excited and more focused on doing hardware. We felt that if we could think, we could do something and build something. And we had the privilege of not having to spend money out of our own pockets because the ecosystem supported our dreams.

Another intriguing aspect was that, as part of all of our college explorations, one of the projects that I and my co-founders wanted to take on was to build a hovercraft out of the engines that people would want to scavenge from the old discarded bikes that our alumni had left behind. So the idea was to collect and convert, make those engines functional, and make the hovercraft float. Incidentally, I used to head an innovation centre at IIT Bombay, which would fund any innovative idea.

> We were like tigers out of a cage in a zoo. People would come to see the tiger, but if you find it out of its cage, nobody will come near it.

However, we realised that maybe hovercraft wasn't something patentable immediately, and therefore, we were looking at something that could be patented. Then we began looking for innovative hovering devices that could not be a regular helicopter because that had already been discovered, which was a commonplace top-down, radio-controlled aircraft. And as a part of that

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journey, we came up with the idea of making a quadrotor with four rotors that were mechanically simpler and intrinsically stable in terms of control management.

And that's when, in 2004, we decided to build our prototype.

That's interesting…

But let me tell you another interesting aspect of this journey. We started the business in 2007, to build chargers for portable electronics. We were making hand crank chargers for various portable gadgets like mobile phones that could give about five minutes of talk time on a feature phone and about two to three hours of standby time. But, at the same time, we were collaborating with IIT Bombay's aerospace department to develop avionics and electronics for various types of radio-controlled aircraft and, later, drones. We participated in a competition alongside MIT US, where we secured a pole position. And then people realise that there's a team in India that can build drone technology from scratch.

This must have been a turning point for you all.

Of course! Because suddenly we started getting a lot of attention from the Defence Research and Development Organisation (DRDO), as their labs would essentially ask us to give them our autopilot technology for various platforms that they were building. So in our initial journey, we were mainly supplying the DRDO. That was a huge boost for DRDO as well because they were able to use a very lightweight miniature device to control their aircraft. And that started our journey in this direction in earnest.

And then, in 2008, when the Mumbai attacks happened, we decided to take this technology and build a product out of it that could help our forces in such situations. And in 2009, we launched India's first fully autonomous drone technology, which is used for homeland security, defence, and civil purposes. But another interesting thing that happened was that one of our early prototypes got featured in the movie Three Idiots.

How challenging were the first few years of business, in terms of operations and importantly getting funds in place?

I would put it this way: We were like tigers out of a cage in a zoo. People would come to see the tiger, but if you find it out of its cage, nobody will come near it. Essentially, that used to be our fate as far as investments

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were concerned. And being a first-generation entrepreneur, not having adequate support with capital was always challenging. But we did find some angel investors and our incubators at IIT Bombay, because of which we were able to see through the early days.

We did find people who would, from time to time, support us with capital—just about enough to allow us to sustain—but it wasn't available in abundance for us to scale.

> Embracing our three pillars- Performance, Reliability, and Autonomy, even this year we continued being all-terrain dominators.

But that scenario compelled us to create a product that generated revenue, allowing us to not only survive but also continue to invest in technology. And because we kept investing in technology, we kept ahead of the curve in the early days of our operations. Even today, I believe our passion has always been to do the best we can for the world, not just locally.

This has helped us, as whenever competition came from anywhere in the world, we were able to live up to expectations and be better than most of our competitors. We were able to develop technology that was relevant to our environmental conditions. We always knew that if we built a product for India, we would be able to build something that was globally competitive.

Our customers have done over 300,000 operations; and every five minutes, an ideaForge drone takes off. We are increasing the pace at which our systems are utilised. We are working with the customer to use it in all sorts of environments. And that comes back to us as feedback and makes our systems more robust. At times, maybe it's easy to be the best locally, but to be globally competitive, it takes something else.

You have also recently entered the US market. Correct? Tell us more about it.

One of the reasons why building an all-terrain product in India is important is because when you build it for our conditions and forces, you build something that can survive anywhere else. We believe that we are ready for the global market as far as performance is concerned, our own experiences, and anecdotal evidence all point towards the fact that we may have some of the most competent products out there in the world, which can help in the last mile surveillance and mapping use cases. We recently participated in Commercial UAV Expo in Las Vegas. The SWITCH has seen significant demand and interest in US markets due to the recent NDAA SEC848 compliance leading to the banning of the use of Chinese components and outright blacklisting of certain Chinese drone makers. With governments worldwide banning Chinese products, there is a huge demand, and ideaForge is significantly filling the vacuum of increased demand created by the market's need for non-Chinese drones.

Apart from the US market, we have a presence in the middle east and some parts of our neighbouring countries in which we are interested in serving our systems.

What makes ideaForge drones specialist than its competitors? How do you place ideaForge compared to them?

In terms of size and market share, I believe it is safe to say that we are well ahead of our competitors in the majority of the country's markets. As far as system performance is concerned, some of our platforms are industry leaders, not just in India but globally. What makes our drone specialists is that they focus on performance, which directly helps improve productivity. They focus on reliability, which ensures that you can get that productive outcome for a very long period and can sustain a lot of duty cycle factors. And last, but not least, you want to build it so that you don't need a very, very special skill or training to use it; you need the least trained resource in that sense to be deployed behind a product like this.

And if you have that combination, where the product is high-performing, very reliable, sustains the duty cycles, and does not need a lot of skill to be operated, you get the perfect sort of storm of a product that can reduce the cost of ownership for the end customer. Our product does not engage the user; it engages the user's desire to get the outcome. We believe that it translates well to the global ambition of using more and more of this technology in various facets of business operations and other operations on the defence and civil sides.

We believe that we do have a sustainable advantage.

But to stay ahead of your competitors, and to remain relevant in the global as well as the domestic market, one needs to be open to collaboration.

We welcome collaboration. For instance, we recently signed a distribution agreement with Ingram Micro

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India to expand our global distribution network. Ingram Micro will distribute ideaForge's portfolio of world-class drones under this agreement, ensuring that UAVs deliver consistent results across major applications. This is a significant step forward for our company and the entire UAV ecosystem. Ingram Micro's skilled team, extensive distribution network, and specialised inventory planning framework will help us scale up distribution across the globe. This strategic collaboration will help us to deliver superior results with high-performing drones in the UAV ecosystem. Enabling operators to investigate questionable things and circumstances without endangering their security or welfare by getting real-time data on issues such as area surveillance and public safety monitoring makes them an extremely versatile system that can accomplish a wide variety of tasks.

That said, last year, announced a partnership with Savex Technology, India's largest ICT distributor, to distribute our best-in-class UAVs. Through Savex Technologies' distributor network, ideaForge will be able to strengthen our presence in the Indian market.

We also heard a few rumours of the hostile takeover of ideaForge. How did you manage to evade this tricky situation?

I love the saying that you achieved greatness when you're oblivious to the dignities of those above you and make people below you oblivious to yours. I think we've never let ourselves be bullied. There will be power displays and they keep happening even today. This is something I believe in from the very early days of my journey as a student in college.

Walk us down memory lane of 2022. How was it for ideaForge?

Being a global leader in drone manufacturing, that is breaking ground in UAV technology, we continued exploring new heights. Embracing our three pillars- Performance, Reliability, and Autonomy, even this year we continued being all-terrain dominators. To begin with, this year has seen immense growth, implemented diverse innovations, and adhered to delivering commitments. ideaForge is the leading drone manufacturer in India, and this year we bagged the largest mini-VTOL UAV contract globally. In addition, we successfully delivered a repeat order of SWITCH 1.0 to the Indian Army. Not just defence, ideaForge has spread its wings across diverse other domains serving numerous applications.

We serve the Defence, Homeland Security and Enterprise market segments primarily through two broad application categories: security & surveillance, and mapping & surveying. We have a large client base that includes numerous Defence & Homeland Security agencies, other government bodies, and the industrial sector.

Having to contend with almost all kinds of extreme terrain, altitude and weather conditions that the Indian Subcontinent uniquely challenges us with, our products are 'Built like a Bird and Tested like a Tank'.

The year 2022 also witnessed some great product launches at ideaForge. We introduced NETRA V4+, our intelligent surveillance drones that are a great pick for defence and coast guard applications. The other launch included our software BlueFire Live! which went live and made monitoring flights easier for anyone from anywhere. This real-time video streaming solution helped remote users to get secured and encrypted access to the video footage. And finally, our ideaForge Care offers interesting plans like the ideaForge Care 360, which will be a treat to our customers with its top-notch services that foster everlasting relations!

We know the power of meeting like-minded folks and exhibiting our latest piece of work to stay abreast and align well within the industry. As a result, no stones were unturned when it came to attending events. We marked our presence across both domestic and international events such as Bharat Drone Mahotsav, Commercial UAV Expo, DefExpo, GeoSmart, etc.

Overall, the year was all about garnering opportunities and creating impact. Our passion, innovation and technology were the ultimate fueling power that led us to become the 7th top dual-use drone manufacturer globally. From mapping drones to surveillance drones, ideaForge has got your back. The cutting-edge technology and the rigorous testing ensure a high-class performance.

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2022 & BEYOND: ANALYSING TRENDS IN METAL CUTTING & FORMING INDUSTRY

The metal cutting & forming industry has been witnessing an uptick. Based on the recently organised Economic Times Metal Cutting & Forming Series 2022, the article elaborates on the trends in the metal cutting and forming industry.

The machine tool industry forms a core part of India's manufacturing sector. With Industry 4.0 taking shape in manufacturing, there has been a growth in productivity and overall ergonomics which posits as the top factor forming the Indian market growth. Further, the rising number of SMEs and MSMEs, combined with growing demand for better, customised products and strict evaluation criteria, is promoting the market growth. According to an IMARC report, the Indian machine tools market is expected to grow at a CAGR of 11 per cent between 2022 – 2027.

IS INDIA READY?

Ravi Raghavan, President of IMTMA, during a panel discussion at the Economic Times Metal Cutting & Forming Series 2022, suggests that the Indian machine tools industry is expected to grow into a Rs 9,500-10,000 crore market in 2023. He further adds that it will probably be crossing the highest-ever production by a good margin and will only continue to go northward. While the market is expecting a prominent boost, the real question is if India is ready for it. Raghavan explains, "Today, we are very seriously looked at as a competition by many of the advanced countries, so our member companies have sent really good machines to some advanced countries. We are not in that state where we were, maybe a decade ago, where export meant that we would send machines to smaller countries."

While there are gaps to fill in the supply chain, companies need to focus on improving from an aesthetic and workmanship perspective.

ADDITIVE HINDERING SUBTRACTIVE?

Technology has been progressing at a rampant pace, and it's no dice that the automotive industry has been a quick adapter of it. One such technology, additive manufacturing, is now being used extensively in the automotive industry for micro-manufacturing with the accuracy required. However, the real question is whether additive manufacturing will take a bigger piece of the automotive industry. "Additive manufacturing, I don't think will take the pie from the machining industry. Of course, it has a user in the automotive industry," mentioned Navid Talib, COO, Hero Ecycles. Currently, additive manufacturing technology is majorly used in making jakes, fixtures, etc., mostly for things like small kaizens and improvements which have a quick turnaround time. Another area where additive manufacturing is being used largely is in the manufacturing of spare parts, like building a robotic arm. The die & mould industry is, however, taking the technology to the next level at a much cheaper cost.

Adding to how additive manufacturing could be a boon more than a competition for the machine tools industry, Vivek Nanivadekar, Executive Director, Fibro India, mentioned, "It is too premature to talk about additive manufacturing's impact on the manufacturing sector, however, it'll be a complement to the machine tools industry." He continued, "It is certainly not going to replace a particular operation, however, it could be used for manufacturing spare parts or manufacturing the last-minute rush components and be used on one's die and mould."

However, T K Ramesh, Managing Director, Micromatic Machine Tools, believes, "Over time, from a production perspective, you would have a vertical milling machine, which would also have an additive head, which could add something and then from the accuracy perspective, do a light machining cut. So, hy-

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brid machining is perhaps expected to happen from the production perspective." The automotive industry is a major user of metal cutting in India, however, it is only one of the users in a more mature market. "Additive hybrid machines will come in, and there will be some precision activities or complex activities that would go to additive," adds Ramesh and continues, "Regular CNC machines, like what happened between conventional to CNG's for automotive, will go to more day-to-day issues and use. So overall, it'll change, and I think some kind of an adaptation will definitely come. Technology obsolesce will happen, but I don't think that will be a very significant part."

CHANGING TECHNOLOGY, CHANGING INDUSTRY

The machine tool and cutting tool industries have always moved in synergy. Vikas Bharadwaj, Sales Director, Ceratizit India, ascertains, "All the cutting tool companies have a very good engagement with the machine tool builders and there's a constant exchange of ideas and constant exchange of needs discussing their expectations and challenges." He adds, "The domestic market for the cutting tool has been growing in line with the domestic machine tool. Their imports used to be a very high percentage in the past but almost every company has set up their manufacturing here. They use technology transfer, which has helped us make things competitive and bring technology to the doorstep of the machine builders to show what the future looks like, which will continue further as well."

BECOMING A RESPONSIBLE LEADER

While industry opportunity grows, and business flourishes, it will be pivotal to be responsible leaders who prioritise organisational sustainability.

Companies today have started adopting sustainability seriously. Plants today are working towards functioning plants on renewable energy. "We use more solar, more renewables, and more conserved water. Most of us are net zero on water consumption. So, all these which probably were being used at an advanced level, all of us were doing for last many years definitely, but that has now picked up internationally. People are thinking in these directions, and you can see those in the plans today," Raghav signed off.

"EVERY STRATEGY WAS DRAFTED KEEPING EMPLOYEES, CUSTOMERS AND EVERY STAKEHOLDER IN MIND"

How is your organisation working on becoming a key contributor to the metal cutting & forming sector with sustainability as a focus? Can you detail on a few strategies?

AMS is in business of metal cutting with focus in designing and manufacturing of machining centres for over 28 years now. From the first year of inception, the vision was well defined and articulated by our founders. Every strategy was drafted keeping employees, customers and every stakeholder in mind. This clearly set AMS on the skyward growth path from delivering three machines in the first year to around 2000 machines in 2021. In simple, our strategy was strongly bonded with our culture values.

AMS will soon be participating at IMTEX 2023.

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> Our well thought strategic initiatives from product development to market development is in-line with our plan, which will enable us an optimistic growth
>
> **L S Umesh,** Director & CEO, Ace Manufacturing Systems (AMS)

What kind of innovation from AMS can we expect to see at the event?

IMTEX has finally arrived after a long gap of four years. We are very excited to be part of IMTEX 2023. This time AMS will showcase a combination of VMCs and HMCs product range that are suitable for applications across industry segments such as automotive, die & mould, aerospace & defence, the range of products demonstrated shows capabilities of our Indian engineering talent. The showcase highlights are high speed machining, compact, precise and performance oriented VMCs, competitive ram type HMCs, high productive twin spindle VMC and 5-axes machines for precision components.

What is your company's business outlook for 2023?

There are predictions of global recession in 2023, but same time many institutions and agencies have given a positive rating to India's growth. Our well thought strategic initiatives from product development to market development is in-line with our plan, which will enable us an optimistic growth. We are expecting to grow over 25 per cent in 2023.

"SITUATION DEMANDS BUSINESS TO BE MORE AGILE AND FOCUSED TO ACHIEVE BUSINESS RESULTS"

> The focus of new product introduction had always been to fill up the gaps felt by the customers in different market segments and also the timely introduction of products to satisfy the perceived product configuration and technology needs"
>
> **T P Sridhar**
> Director & CEO, Ace Designers

How is your organisation working on becoming a key contributor to the metal cutting with sustainability as a focus? Can you detail on a few strategies?

We have had the right mix of high- volume products and a complete basket of appropriate products for multiple segments. Though we have built a huge ecosystem to address large volume production of standard configurations, equal flexibility has also been built up to address low volume and special requirements. We have always been very strong in providing tooled-up solutions and some special executions to cater to the changing needs of the customers. The focus of new product introduction had always been to fill up the gaps felt by the customers in different market segments and also the timely introduction of products to satisfy the perceived product configuration and technology needs. We believe that we can offer the complete range of products needed in the market with both horizontal and vertical series of lathes.

The vision is to be recognised as a global, responsible, sustainable, and most preferred organisation. We are working on initiatives like power, water, waste, material conservation to make our process and products sustainable. Ace Designers, Peenya plant was awarded with CII GBC GreenCo Bronze certification during FY22.

Ace Micromatic will soon be participating at IMTEX 2023. What kind of innovation from Ace can we expect to see at the event?

IMTEX exhibition is being held at BIEC in from 19th to 25th January 2023 after a gap of four years. We are planning to show 12 machines in the exhibition, demonstrating newly developed products to bridge technology gaps in industry and cater to emerging customer segments. As before our group will have the largest stall in the exhibition.

How do you foresees the year 2023?

The Indian machine tool industry is having a great opportunity both with the domestic requirements and higher-level demand even from the export market. With a fairly high product acceptability in the global markets, we have a huge potential for growth despite the threats that are being posed by the EV, additive

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manufacturing, etc., especially for the metal cutting machine tools. Since the global pandemic, supply chain disruptions, raw material cost escalation and geopolitical tensions market dynamics are changing very quickly. This situation demands business to be more agile and focused to achieve business results.

"WE EXPECT 100 PER CENT CAGR GROWTH ON FY2022"

> India's focus on establishing national infrastructure will drive tremendous growth in several sectors in manufacturing that we serve

Madhusudan Kestur
Director, AceMicromatic Manufacturing Intelligence Technologies (AmiT)

How is your organisation working on becoming a key contributor to the metal cutting & forming sector with sustainability as a focus? Can you detail on a few strategies?

India's manufacturing sector is poised to become an engine for huge economic growth and job creation. In order to make this growth sustainable, India's manufacturing value chains must lift their productivity. AmiT has been working with customers, in both the sectors of metal cutting and forming, in their adoption of Industry 4.0 & manufacturing analytics leading to increased manufacturing efficiency and reduction in resource consumption, waste, and environmental impact.

Ace Micromatic will soon be participating at IMTEX 2023. What kind of innovation from Ace can we expect to see at the event?

AmiT is launching an IoT platform that can be leveraged by our customers to accelerate their Industry 4.0 adoption. This platform would also enable us to serve our customers better, by way of providing value added services in the coming months.

What is your company's business outlook for 2023?

Forecast for 2023 looks very positive. India's focus on establishing national infrastructure will drive tremendous growth in several sectors in manufacturing that we serve. We expect 100 per cent CAGR growth on FY2022.

WE ARE PIONEERED IN CRAFTING GERMAN PRECISION IN INDIA

What are some of the noteworthy changes that the industry has incurred this year?

The manufacturing industry not only in India but worldwide has undergone a lot of changes recently mainly due to the Covid pandemic. Remote working, Digital Manufacturing, Smart Factories etc. have become the buzzwords in the industry. But we need to adopt those practices which are more appropriate to Indian reality. We need not follow the western world or Japan in making the factory fully automated. If we do that then we can not offer the cost advantage. I would phrase it as 'HUMANAUTOMATION'. The automation around human beings. Certainly, Digital manufacturing will our manufacturing industry speed up the whole cycle.

Vivek Nanivadekar, Executive Director, FIBRO India Precision Products Pvt. Ltd.

In addition, Additive manufacturing is the technology on the horizon. This technology is developing fast. We will see the growing contribution of Additive manufacturing to Indian manufacturing output.

Secondly, due to the government initiative towards making India a global manufacturing centre, the manufacturing sector is expected to grow at a much faster rate than our expectations. This movement is also supported by the pandemic, in shifting from China or adding manufacturing facilities in India.

Can you cite an example of how your organization is preparing for any of the challenges set to come?

There is a so-called threat from the new Corona variant. But I believe not only that as a nation we all are well prepared to face this challenge having learnt

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from the experience. Many experts in the field are of opinion that even though this new variant enters India, it will not be severe due to the vaccination and the overall immunity of the Indian society.

We are in the process of implementing Industry 4.0, as such all major machines in our factory are connected to an electronic device to measure OEE. So, remote monitoring of factory operations is possible. Secondly, we have started effectively using TEAMS meeting along with the analytical tool Power BI, which again would certainly help us to run the factory remotely.

Incidentally FIBRO India entering its 15th year of successful Indian operations. We have earned the trust of Indian customers by supplying 'German precision, crafted in India'. Now the customer's expectations from FIBRO India have increased. We will certainly not let them down.

Can you elaborate on a few technologies at display by your organization at Imtex?

Since this IMTEX is happening after a gap of 4 years, exhibitors, as well as visitors, have great expectations from each other. Certainly, new technologies like digital/ robotic manufacturing, Additive manufacturing, and machining technologies for the Aerospace, Defence sectors will be on display. As an exhibitor, we are expecting quality visitors for techno-commercial discussions. We would also like to understand market trends and the customers' outlook towards the year to come. In our booth B135 in Hall 4, we will be launching long-awaited Rotary tables for metal cutting and a Wireless Pressure monitoring (WPM) system for Gas springs used in press tools. In addition, of course, the range of Rotary Tables for Automation sectors, and a range of Standard Parts including large size Aerial CAM units will be on display.

OUR MEMBER COMPANIES ARE IN EXPANSION MODE

> The Advanced Machine Tool Testing Facility (AMTTF) set up in Bengaluru tests the performance, and safety of machines and develops solutions in enhancing the efficiency and performance of machines. During FY 2020-21, AMTTF carried out around 350 assignments serving more than 70 customers.
>
> **Ravi Raghavan,** President, IMTMA

With the rapidly evolving market, where do you envision discrete manufacturing in the next five years?

Machine tools are key to augmenting various discrete manufacturing sectors such as automobiles, defence, railways, electronics, and white goods, among others. Following the reopening of the economy during the post-pandemic period things gained momentum driven by pent-up demand for services as well as the announcement of various government schemes including PLIs.

Consumption and production have been moving northward, overall, we have seen a growth of around 15 – 20 per cent in terms of consumption and production of machine tools. The industry is in a relatively comfortable zone when compared to what it had been in previous years. India is being favourably looked upon by various nations for doing investments and setting up industrial units. When it comes to exports, the industry was long considering smaller nations which isn't the scenario today.

Many of our member companies are doing business with advanced nations by supplying good machines besides meeting the unique requirements of customers, even from a technology perspective. Given these, we expect a growth rate of 20 per cent CAGR in terms of consumption of machine tools and an 18 – 22 per cent growth in domestic production.

What are some of the technologies in discreet manufacturing that you envision will revolutionise the sector?

Going by the recent trends multiple technologies are driving the advancement of discreet manufacturing. Some of these include artificial intelligence and machine learning, advanced robotics, additive manufacturing, especially hybrid machines, laser-based technologies for cutting, welding, metrology applications, cyber-physical systems, digital twin, precision machines, self-monitoring and self-diagnostic intelligent machines, multi-tasking machines, etc.

How is your association working on becoming a key contributor to the metal cutting & forming sector? Can you detail a few strategies?

Machine tool builders, academia and user industries are working in tandem to develop products. The industrial robot being built in the Advanced Manufacturing Technology Development Centre (AMTDC) at IIT-Madras is a classic example. Many other similar projects (especially for building next-generation machines) are under various phases of development at AMTDC.

Along similar lines, the Advanced Machine Tool Testing Facility (AMTTF) set up in Bengaluru tests the performance, and safety of machines and develops

solutions in enhancing the efficiency and performance of machines. During FY 2020-21, AMTTF carried out around 350 assignments serving more than 70 customers.

A first-of-its-kind exclusive machine tool park in Tumakuru in Karnataka (TMTP) connects the domestic and international OEMs and supply chains to set up manufacturing facilities for building machines under the Make in India and Make for World initiatives.

IMTMA has also constituted task forces for addressing the requirements of auto and emerging sectors such as electronics, furniture, renewable energy, etc. The Association is not only offering machines but also offering sector-based solutions.

In your opinion, what are the key factors currently driving the metal cutting & forming industry? What are the challenges that the industry will have to overcome to become a global powerhouse?

Many of our member companies are expanding their capacities and soon we may have higher capacity than the requirement. In terms of technology, there was a gap, but now companies are working towards bridging it. The industry is also hiring people with the right skills. Of course, there will be gaps in high technology big size machines which will be in need going forward due to the development of industries in the domestic areas, for example, railways, ports, infrastructure, etc.

What is your association's business outlook for 2023?

IMTEX 2023 is happening after a gap of four years and the machine tool industry is eagerly waiting to connect with user industries. This will set the tone for alleviating business to new heights in the coming quarters. Most of our member companies are full of orders and are actively looking to increase their market share.

OUR GOAL IS TO BE 'NET ZERO' COMPANY BY 2040

Ceratizit recently celebrated its 100th year. What factor do you attribute your business success to?

We have never forgotten that our business is ultimately about people. We put the customer at the centre of everything we do. The development of new products and services must not become an end in itself. They must help our customers to improve their processes. But we are also very aware that our success is based on our employees, whose commitment and innovative spirit allow us to offer our customers the best possible solutions time and again. Building on these two factors, it comes down to innovative products and services as well as the profound know-how along the entire value chain.

Thierry Wolter, Member of Executive Board, Ceratizit for Machinist

Can you elaborate on some of the revolutionary solutions invented by Ceratizit that have made an impact in the manufacturing sector and how?

Our EcoCut multifunctional tools are a good example. I like to call it the Swiss army knife of cutting tools because you can use it for drilling as well as for turning. It was introduced in the 1990s, but still enjoys great popularity and still receives upgrades, for example with new carbide grades. Another good example is our TiB2 CVD coating for titanium machining, which was introduced in 2009. It is still a unique selling point and the benchmark in this field. Finally, I must of course mention our FreeTurn tools for High Dynamic Turning (HDT). The ecosystem is now in place and with our new programming tool, CERAsmart ToolPath, it will be very easy in the future for the broad mass of turn/mill centre users to revolutionise their turning processes with HDT.

From a business perspective, how important is the Indian market for your organisation? How are you working on entrenching further here?

Asia is the region where we have the highest growth rates, and India is without question particularly important. We not only have three production facilities and a high market share in India. India is also the market where we have the highest share of new products. This means that our innovative new solutions are very well received, and I think our continuous investments, such as the new building in Bangalore, are a clear sign that we want to continue to grow in India.

Sustainability is majorly picking across sectors. How is Ceratizit working on building a sustainable business?

Customer centricity and the development of innovative solutions have always been at the core of our business. We want to help our customers to become more efficient. But that is no longer enough. As a company, we see it as our responsibility to also treat sustainability as a top priority and to do our part to ensure that this planet will remain worth living on for future generations. That is why our vision is to be the leader in sustainability for the hard metal and

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cutting tool industry by 2025.

We consider the whole value chain of environmental, social and governance criteria (ESG). During the first phase, the focus will be on aspects that have the greatest leverage. To quickly and drastically reduce our carbon footprint, we will begin with three key 'levers'. One crucial factor will be to increase the proportion of raw materials that stay in the production chain to over 95 per cent. Preparing secondary raw materials requires 70 per cent less energy and provides a 40 per cent reduction in the carbon footprint compared to the use of primary raw materials from mining. A positive side effect of this is that it secures our supply chain for raw materials.

The second lever is the switch to green electricity at all sites. Thirdly, there is our hydrogen supply. Until now, the hydrogen required in production has been obtained via steam reforming from natural gas. In future, we are planning to switch to green hydrogen, which is produced by hydrolysis with green electricity. We will cooperate with our current suppliers on this, but also be developing our electrolysis plants.

The first milestone in the implementation of the new strategy is set for 2025. This doesn't just mean offsetting all emissions generated along the whole supply chain, however. We will reduce actual emissions by 35 per cent. For the second milestone, 2030, we aim to reduce emissions by 60 per cent compared to 2020.

The most ambitious goal is to be 'net zero' by 2040. It undoubtedly is a huge challenge to reduce carbon emissions by 75 per cent across the whole value chain in this timeframe. But thinking of future generations, we don't see any alternative options and are looking forward to also playing our part with innovative products and a wide range of services.

With the EV trend picking up, how is your organisation working on having a key piece of the market?

We are already very strong in the automotive sector, not least thanks to the acquisition of KOMET five years ago. The development of solutions to produce e-cars could therefore take place in close exchange with our customers from the very beginning. This means that today, for example, we have solutions for machining the stator housing for the e-motor or for machining the battery tray in our portfolio. In addition, our distinctive expertise in machining aluminium and composite materials such as CFRP and FRP helps us. Looking beyond machining solutions, we also produce carbide blanks for punching tools, for example, which are needed for the production of rotor and stator parts.

What is in store for your business for 2023?

We've seen clouds on the horizon for a while now. We don't know yet what exactly to expect but we will see some kind of downturn in the economy. We have done our homework in the past years and optimised our structures after several company takeovers. This restructuring in combination with our digitalisation initiatives and our committed employees make me confident that we will come through the impending bad weather in good shape.

OUR WORKFORCE IS PREPARED FOR THE NEW OPERATING PROCEDURES

What are some of the noteworthy changes that the industry has incurred this year which is set to benefit companies in the future?

Following an unsteady return in 2021, Industrial developments in 2022 become increasingly tech-focused. Although the significance of COVID-19 has decreased, the ongoing repercussions of the global pandemic and its effects on the economy have not yet been reversed. We no longer have access to normalcy or "business as usual." Nevertheless, despite all the chaos, there are some positive aspects. The emerging new reality is made up of potential opportunities. Through widespread acceptance of the modern digital world, related breakthroughs, and acknowledgement of the need for sustainable technology solutions, the year 2022 revealed a glimpse of tectonic transformations for many industries in the market. Industries are becoming more adaptable and resilient. These developments will undoubtedly have a significant impact on the value perception as a whole as well as the future industrial world.

Dr Umesh R. Mhatre, Managing Director, Surface Modification Technologies Pvt. Ltd

There is a risk of a new COVID variant out there. Do you think the industry is better prepared now to deal with the challenges of a lockdown? Can you cite an example of how your organization is preparing for any of the challenges set to come?

The unprecedented COVID-19 pandemic, which began in 2020, had a profound impact on the world economy through supply and demand dynamics and it is not yet over. Even while the possibility of a further lockdown is extremely remote, I'm sure the industries are better equipped to handle the difficulties that would arise

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should such a circumstance arise. Now business leaders are aware of the value of flatter, more flexible organisational structures that enable responsiveness to change. A distinct inclination towards Artificial Intelligence (AI) based operational setup is in the play now. In many different sorts of sectors, a framework of work-from-home and hybrid work habits has been successfully established, and it now appears to be at least partly permanent.

The Surface Modification Technologies Pvt. Ltd. (SMT) team is also considering localisation efforts and focusing on increased automation. Adoption of an ERP-based operational setup with cloud-based, simple-to-use remote access formats will undoubtedly aid us in maintaining control of operations in the event of an unfortunate lockdown if one occurs. With several health and safety precautions, we are preparing our workforce for an entirely new standard operating procedure.

What are your expectations from IMTEX this year? Can you elaborate on a few technologies from your organisation at the show?

IMTEX is a premier exhibition for the Indian metal-cutting industry. The occasion gave us a chance to experience the most latest technological advancements from both India and other international companies. The inclusion of "Digital Manufacturing" would continue to be a major draw for IMTEX 2023. SMT will also be present at IMTEX 2023 in Hall No. 5. (booth No. A-149). We represent advanced surface engineering solutions for the upcoming high-tech metal-cutting industry. We believe that to strengthen the Indian manufacturing industry (particularly MSMEs), local know-how is critical. We are excited to learn more about the futuristic automation technological demonstrations presented at IMTEX-2023.

How do you plan on achieving the set targets for 2023?

According to the International Monetary Fund (IMF), global growth is expected to be 2.7 per cent, which is not good news. As of now, 2023 may feel like a recession. Even if we try to be optimistic, the global economy appears to be slowly recovering. Various sectors of industries will continue to remain vulnerable due to the disrupted supply-chain crisis. Businesses will undoubtedly continue to deal with the aftereffects of the global pandemic while also attempting to keep up with the unprecedented speed of technological adoption. But there is always a bright side. New worlds always bring new opportunities. We intend to maintain our growth by refocusing our business policies on long-term sustainable technological solutions to position ourselves for an eventual upturn.

BUILDING A QUALITY CULTURE IS CRUCIAL FOR INDIA

What are your expectations from IMTEX this year? Can you elaborate on a few technologies from your organization at the show?

IMTEX 2023 is one of the largest manufacturing events in SE Asia. As always, we look forward to connecting with the ecosystem and discussing and solving key manufacturing technologies to accelerate businesses.

It's an excellent opportunity to witness first-hand what's going on in manufacturing and develop new relationships and collaborations. We are also eager to showcase how Hexagon solutions can help address key manufacturing challenges.

Aditya Chaudhary, Director- Sales, Smart Manufacturing, Hexagon Manufacturing Intelligence

At the upcoming exhibition, we will be showcasing our end-to-end solutions for the manufacturing industry including aerospace, automotive, and smart electronics with a focus on automation, digital manufacturing and additive manufacturing. These range from Design and Engineering, production planning, quality, and virtual life estimation, to certification assessment and metrology.

How do you see the smart manufacturing ecosystem evolving? Is India ready for it?

With traditional manufacturing, automotive companies, for example, typically produce 50 to 100 prototypes of a particular vehicle, before commercialising one of them. Smart manufacturing can reduce this number to 10 per cent or less. Through technology, manufacturers can simulate the entire process digitally, rectify the problem areas and then replicate it in the physical world. Not only does this reduce the margin of error and improve overall operational efficiency, but it can also save on expenses, considering that the cost of prototypes is huge. This is especially crucial for EV development given the fast pace of EV technology evolution and the fact that it is a relatively new industry.

Hexagon is working closely with the automotive industry to help manufacturing plants get the product right the first time and reduce the time to market by making the manufacturing process intelligent. Leveraging our expertise in design,

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production and quality (both actual and perceived), we can digitally simulate the entire manufacturing process and then replicate it in the physical world. By enabling intelligent automation where machines make decisions based on data, Hexagon is working to enable an autonomous future. AI and ML, trained in thousands of scenarios, can efficiently handle zillions of repetitive tasks, saving time and resources for manufacturers.

Hexagon is collaborating with the Central Manufacturing Technology Institute (CMTI) for a Smart Manufacturing Centre for innovation and incubation. MSMEs can use the facility to explore smart manufacturing, thereby giving them the confidence to go back and use these technologies in their factories.

Is there a 'Culture of Quality' evolving in India? What measures will help drive a change in the overall quality perception in Indian manufacturing?

India has never been known for its strong quality culture in manufacturing. Several reports have highlighted how quality complaints and fulfilment delays have important constraints that have caused India to 'punch below its weight' in manufacturing despite its potential to become a manufacturing powerhouse.

However, building a quality culture is crucial if India hopes to leverage the tremendous opportunity at play. Consistent and superior quality is important, not just from the perspective of branding and reputation but also from an efficiency point of view. Getting products first time right saves costs since it reduces wastage and eliminates the need for rework. Quality manufacturing also helps bring down warranty costs.

Following stringent quality, processes are critical to building global competitiveness. One great example is the Indian pharma industry. The industry realised the importance of documentation and good manufacturing practices (GMPs) when industry players started to expand into the Western Hemisphere. The quality practices they build have stood them in good stead in their growth journeys.

As consumers, quality is the number one determinant that influences our buying decisions, irrespective of the size or complexity of the product. Consumers are very savvy when it comes to judging quality the quality of a product. Even with something as small as a bar of chocolate, they instantly know if there is something wrong with the product.

Therefore, quality is important for all manufacturers whether they manufacture automobile parts or toothpaste or excavators or pharmaceuticals. Therefore, maintaining the highest standards of quality requires not just stringent processes but also a culture that prioritizes quality and excellence.

OUR WORKFORCE IS PREPARED FOR THE NEW OPERATING PROCEDURES

Tell us about some of the noteworthy changes that the industry has incurred which will benefit companies in the future.

The faster adaptation of Industry 4.0 solutions, automation solutions and the use of robots has paved the way for more advanced hardware and software that would include smart features & networks, automated and IoT-ready machines, Artificial Intelligence and more advanced CNC software. This in turn will make future factories more efficient and flexible to operate.

Rajesh T. Ghashi
Managing Director, Chiron India Machine Tools Pvt. Ltd

Do you think the industry is better prepared now to deal with the challenges of a lockdown?

Yes, there is always a threat looming about COVID. However, this would not hinder the industry from operating if the necessary infrastructure is in place and people have been vaccinated and all know the precautions to be taken. As a company, we are prepared and action plans are in place in case of any eventuality.

What are your expectations from IMTEX this year?

We are happy to be back at IMTEX after a long gap and are eagerly waiting to welcome our customers, well-wishers, and colleagues in person. At the upcoming IMTEX 2023, we are proud to introduce a new revolution in the dynamic and highly precise world of machining tiny medical instruments, delicate jewellery and the most intricate watch parts. The MICRO 5 five-axis machining centre is extremely compact and can be set up very quickly almost anywhere – in the production hall or right at the workstation. The »5« in the name stands for the ideal 5:1 ratio of machine size to a workpiece, for five times lower weight, and maximum efficiency. Energy consumption is 50 times lower in comparison to conventional systems.

SMT

Surface Modification Technologies Pvt. Ltd.

Designers of Surface Engineering Solutions

SMT provides surface engineering solutions using sophisticated state-of-the-art Physical Vapor Deposition (PVD) technology tailored to the needs of the metal cutting industry. Since 2004, we have served a diverse range of industrial sectors by providing standard as well as custom surface engineering solutions to improve the performance of various engineering tools and components.

SMT has emerged as a key player in the surface engineering industry due to unrivalled knowledge of the processes and technologies involved. Our in-house R&D centre is always enthusiastic and upbeat about taking on new challenges, and as a result, we are able to meet the specific requirements of emerging markets.

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AUTOMOTIVE INDUSTRY IS SET FOR A NEW BENCHMARK IN 2023

What are some of the noteworthy changes that the industry has incurred?

I believe shifting electronic component manufacturing to India will make big difference to Indian manufacturing in terms of high-precision manufacturing technology, large-scale employment opportunity and the related ecosystem.

Can you cite an example of how your organisation is preparing for any of the challenges?

Thanks to the widespread Vaccination initiative by the government, I think lockdowns are behind us, however, we need to follow basic COVID protocols like wearing masks and sanitisation as preventive care.

Raghuram MK
General Manager, Kyocera CTC Precision Tools Pvt. Ltd

What are your expectations from IMTEX this year?

IMTEX 2023 is a big opportunity after four long years to showcase our new products and meet customers from across the country, prospective channel partners - KYOCERA CTC will be showcasing innovative and high-performance new products addressing the precision manufacturing focussing automotive, EV & electronic component industry.

What is your business outlook for 2023?

I believe the automotive industry including auto components will exceed 2018 numbers and set a new benchmark. The non-automotive industry is also expected to grow which will offer new opportunities for the cutting tool industry.

WE ARE PLANNING FOR SERIES A FUNDRAISER THIS YEAR

Tell us about some noteworthy changes that are set to benefit in the future?

We see that focus on automation has increased in the industry in general. This is driven by many environmental factors: people shortages post the pandemic, wage inflation (driven by general inflation and shortages), manufacturing getting a boost with government support on the PLI side and global sourcing wanting a China alternative. This is benefiting companies supplying automation options and the demand is at an all-time high for the same.

Can you cite an example of how your organization is preparing for any of the challenges set to come?

Firstly, we feel India is very well prepared for COVID due to the excellent vaccination drive undertaken plus the natural immunity that has been allowed to build by not enforcing strict lockdowns.

However, even if the unforeseen happens we have now learned. A lot of previous experience and have much better tools or processes to deal with them. This includes, for example, our ability to do complete remote deployments over 4G if required.

Saurabh Chandra, CEO, ADMIC

What are your expectations from IMTEX this year?

We are expecting a lot of genuine customer demand at IMTEX. We are showcasing our two models: the Sherpa Tug that can pull up to 1 tonne on trolleys fully autonomously in factories. We can even do an inter-plant movement with outdoor stretches which is a first in the market. The other model is a Sherpa Rollertop that can do tote movement between conveyors in a fully autonomous fashion.

What is your business outlook for 2023? How do you plan on achieving the set targets?

We are very gung-ho for this next year. The pipeline and demand are very strong and our limitation has been our ability to service all the requests we get. We need to expand to cater to the same and are planning our Series A fundraiser this year to fuel the growth.

By Rahul Kamat

MANUFACTURING, HOW'S THE JOSH? HIRE SIR!

The government of India's Rs 6 lakh crore asset monetisation strategy over the four years till 2025, followed by revisions in FDI laws in the defence and telecom sectors, would have a greater influence on employment for the current quarter.

Ever since the pandemic has shown signs of weakening in the country, India Inc is witnessing a surge in job applications, as the employment market is gradually opening up. The latest report by TeamLease, a human resource-providing platform, revealed that employers within the manufacturing sector have shown an increase in hiring intent. The report is based on a survey by TeamLease, which covered 301 small, medium and large companies across the nine manufacturing industries across India.

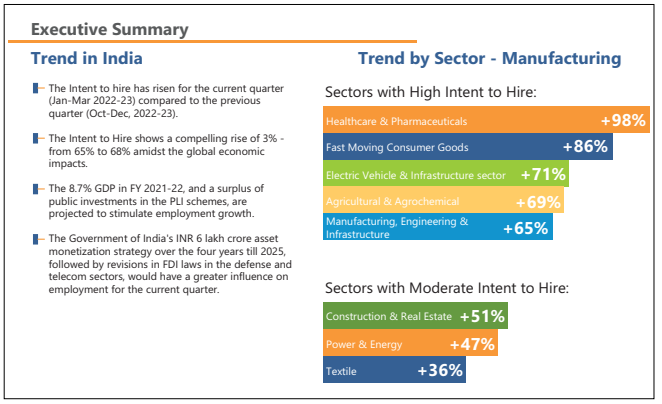
As per the report, the intent to hire shows a compelling rise of 3 per cent from 65 per cent to 68 per cent for the current quarter (Jan-Mar 2022-23) compared to the previous quarter (Oct-Dec 2022-23). The surge in hiring intent is amidst the global economic impacts.

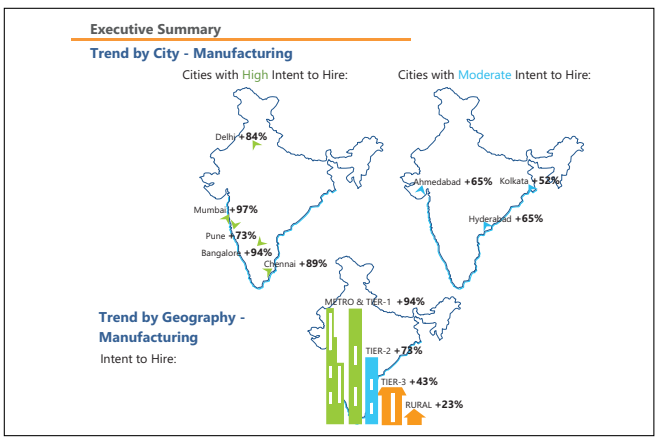
Additionally, the report also highlighted that the hiring intent was greater in metro cities (94 per cent) as compared to the non-metro ones (73 per cent). Mumbai (97 per cent), Bengaluru (94 per cent), Chennai (89 per cent), Delhi, (84 per cent) and Pune (73 per cent) were the cities with the highest hiring intent. The rural sector has the least change in intent to hire of +2 per cent but a positive outlook specifies the growth index in this industry.

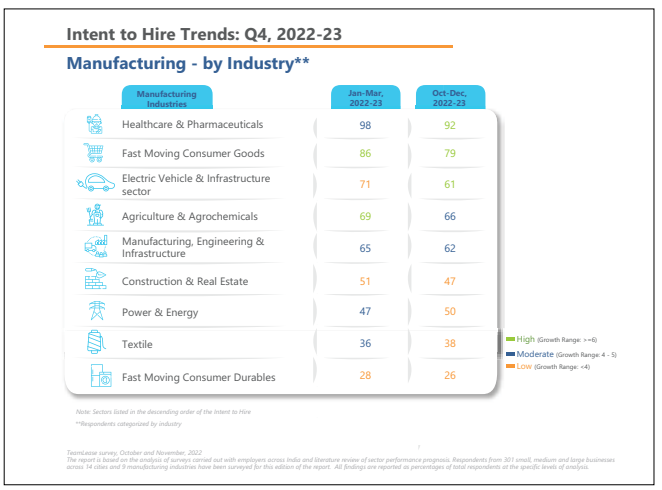
WHAT AIDS EMPLOYMENT?

It is believed that the 8.7 per cent GDP in FY 2021-22, and a surplus of public investments in the Production Linked Incentive (PLI) schemes, are projected to stimulate employment growth. The Government of India's Rs 6 lakh crore asset monetisation strategy over the four years till 2025, followed by revisions in FDI laws in the defence and telecom sectors, would have a greater influence on employment for the current quarter.

"The global employment rate has increased considerably post the last Covid-19 wave and is poised to grow stronger in the coming quarters. With domestic demand increasing, despite stringent external







conditions, the manufacturing industry is projected to witness all-encompassing growth," said Mahesh Bhatt, Chief Business Officer of TeamLease Services.

He also added that the government's agenda to drive 'Make in India' and the introduction of reforms to boost domestic manufacturing will enable India to become a more attractive destination for investments which in turn will impact employment positively.

WIN SOME, LOSE SOME

The report also revealed that the attrition rate is also balanced in the sector. Apart from healthcare & pharmaceuticals, the manufacturing industry have single-digit attrition rates. During the Oct-Dec 2022-23 quarter, attrition in the healthcare & pharmaceuticals industry increased to 15.67 per cent from 14.71 per cent during the Jul-Sep 2022-23 quarter.

The other sectors with a hike in attrition were: agriculture & agrochemical (7.51 per cent), power & energy (5.63 per cent), construction & real estate (4.19 per cent), fast-moving consumer durables (4.03 per cent), sectors like textile (1.22 per cent) and electric vehicle & infrastructure (2.63 per cent) sectors faced the lowest attrition trends for the Oct-Dec, 2022-23 quarter.

THE DOMINATORS

Large industrial enterprises dominate the hiring intent (69 per cent) by a significant margin as they gear up to respond to domestic demand. Medium-sized businesses (44 per cent) lag behind large firms on the deficiencies they face concerning technology and financial potentiality. Also, the growth in intent to hire is the highest among others with a +4 per cent increase.

Signalling uneven post-pandemic recovery the small segment of businesses is having a downfall in terms of hiring intentions and the numbers have dropped from 41 per cent to 39 per cent compared to the previous quarter.

Entry-level & Junior level talent roles are noticing a positive hiring intent of 55 per cent and 60 per cent, respectively. Upskilling and reskilling activities post the pandemic have created an impact in this segment. Mid-level roles are having a significant downfall from 29 per cent to 27 per cent, therefore intent to hire is low. Senior-level job roles at 24 per cent hiring intent are the lowest, proving that the manufacturing industry is keen to hire youthful talent.

Sales roles have a staggering 98 per cent hiring intent followed by marketing with 79 per cent to 86 per cent growth in intent to hire. Both functions are looking forward to building the economy with an increase in young talent supply at hand and maximising the efforts to reach the masses.

Recruitment in the field of information technology with an intention to hire at a rate of 86 per cent is aided by the pervasive desire to innovate and create an environment that is becoming more accessible. Moreover, the rise in hiring intensity is nine per cent, making it the second-highest of all indicators.

Engineering and blue-collar (both at 78 per cent & 75 per cent respectively) have reasonably robust recruiting intentions. Both these roles have a growth rate of 11 per cent and 8 per cent, respectively.

The functions with the lowest recruiting intent are office services (31 per cent) and human resources (18 per cent), both of which have a better presence in the services sector than in the manufacturing business.

By Rahul Kamat

STRONG GROWTH VISIBILITY TO DRIVE CAPITAL GOODS

The capital goods sector has witnessed strong order inflow momentum in the past 12-18 months, spurred by the government as well as private investments.

The government's efforts and initiatives, such as Atmanirbhar Bharat, Power for All, Make in India, and PLI schemes, have given an impetus to investments across various sectors of the economy and new opportunities are emerging. Further, global companies are adopting the China Plus One strategy to de-risk their supply chains and are considering India as one of the alternatives. This has turned out to be a good opportunity for India as its manufacturing cost is low and the availability of skilled labour is high.

> The order inflow of leading capital goods companies has grown at an average of 18 per cent y-o-y in FY2022. This has led to the companies achieving the highest-ever order backlog.

Meanwhile, the results are evident. According to a report by BNP Paribas, in the past 12-18 months, there has been an unprecedented increase in order inflows in the capital goods sector. Order inflows are being driven by the spur in government investments post the pandemic to strengthen the country's infrastructure and achieve self-reliance in manufacturing and increase technical competence.

The report also suggests an uptick in private capex as a result of increasing capacity utilisation in steel, cement, petrochemical, and refinery sectors due to the spike in commodity prices has fuelled the order book of most of the leading capital goods companies.

ORDER BACKLOG AT RECORD HIGH

The order inflow of leading capital goods companies has grown at an average of 18 per cent y-o-y in FY2022. This has led to the companies achieving the highest-ever

Order book and order inflows are on a rise on a consistent basis

Most companies witnessed strong growth in inflows in FY22

Company	Order inflow YoY growth			3 Year CAGR	FY23 inflow guidance
	FY20	FY21	FY22	FY19-FY22	(Rs. crore)
Larsen & Toubro (L&T)	5.4	-5.8	10.0	3.0	2,21,950
KEC International	-19.5	4.8	44.9	6.9	18,000-20,000
Kalpataru Power Transmission *	-8.8	16.8	-3.4	2.3	20,000-21,000
Thermax	-2.4	-13.0	96.7	18.6	
VA Tech Wabag	-10.8	-69.8	174.4	-9.6	4,000-5,000
ISGEC Heavy Engineering	-44.9	-9.7	56.9	-7.9	
Hindustan Aeronautics Ltd.	-9.7	221.5	-48.4	14.4	
Bharat Electronics Ltd.	-44.5	78.2	22.7	-8.7	20,000
Triveni Turbine	-7.1	19.0	84.0	11.5	
Blue Star Ltd.	45.6	-27.7	27.6	11.4	
ABB India#	3.7	-15.0	29.2	4.4	
Siemens India#	-13.6	32.4	43.0	17.7	

order backlog. Growth was largely driven by various government initiatives towards infrastructure and being self-reliant through the 'Make in India' initiative – for instance, the launch of the National Infrastructure Pipeline with an investment of Rs 111 lakh crore.

The government would be investing in the railways' sector to enhance track capacity, improve freight efficiency, augment the speed of trains, enhance safety, and ensure better connectivity. The government has planned to expand the National Highway network by approx 60,000 km by 2025 in major economic corridors, strategic areas, and elevated corridor and flyovers network in major cities, such as Delhi, Chennai, Kolkata, Mumbai, and Bengaluru, with an investment outlay of Rs 20.33 lakh crore under NIP.

The government also plans to spend Rs 750,000 crore on oil and gas infrastructure over five years. Further, the private sector witnessed growth recovery post the pandemic, resulting in strong volume growth. Further, a spike in commodity prices and disruption in the supply chain due to the Russia-Ukraine war and Covid-led lockdowns in China led to a significant increase in capacity utilisation levels of private industries. Hence, the rise in capex in sectors, such as oil and gas, steel, and cement as well as emerging avenues such as green hydrogen, digitalisation, data centres, and automation, have led to growth in order inflows of capital goods companies.

STRONG ORDER PIPELINE ACROSS SECTORS

Leading companies have a strong and diversified order pipeline, which would keep the order inflow momentum intact. For instance, L&T eyes order prospects of Rs 632,000 crore. Transmission and distribution companies, such as KEC International and Kalpataru Power, have indicated order pipelines of Rs 110,000 crore and Rs 47,300 crore, respectively, for the coming quarters. Leading defence players, such as BEL and HAL, have indicated order prospects of Rs 60,000 crore and Rs 120,000 crore, respectively, for the next 6-12 months.

SUSTAINABILITY BY PERFORMANCE AND PRECISION

As a commitment, the Chiron Group is moving towards a carbon-neutral goal.

Grow profitably, acquire market shares, and boost global business: The Chiron Group will be pursuing ambitious objectives over the next few years. To help achieve them, the company is setting itself apart from the competition with its product range. The company's commitment to sustainability, an important topic for the future, gives customers and potential customers even more reasons to choose the CHIRON Group. The company has already achieved its first major success in this area: From the end of the year, production at the German sites will be carbon-neutral.

"Our objective is to achieve environmentally conscious and carbon-neutral production — the sooner the better," states CEO Carsten Liske. To this end, in recent months, the Chiron Group has been focusing on developing a global sustainability program. And, by investing in heat recovery and photovoltaic systems, as well as purchasing the required energy from renewable sources, the first milestone has already been reached: Production operations at the CHIRON Group sites in Germany are now carbon-neutral. Chiron China will soon follow suit in 2023 with a photovoltaic system for the Taicang Innovation Factory, while plans are already underway at Chiron Croatia.

Benjamin Kurth, Global Program Manager of Sustainability, explains that, as a machine tool manufacturer, the CHIRON Group faces a double challenge: „Firstly, we are striving for carbon-neutral production at our company and, secondly, we want

Committed and qualified employees around the world are the basis of the leading market position and growth achieved by the Chiron Group.

to ensure that our customers conserve resources and operate machining centres and manufacturing solutions ever more efficiently."

As a founding member of the VDMA Blue Competence Initiative, the Chiron Group actively advocates for sustainability concerns and systematically implements the defined criteria in its products. Alongside improved energy and raw material efficiency, this also includes income-boosting automation of machining centres, resource-conserving implementation of the processes with intelligent turnkey solutions, and the digitalization of customer and development projects.

In the Sustainability Report 2021, the company presented its strategy and detailed its activities in all sustainability-related areas: Continuous development of the product range, responsibility for staff and society, quality, supply chain and resource management, energy use and CO2 footprint.

In his foreword, CEO Carsten Liske states: "With our report, which has been drawn up under the core guidelines of the Global Reporting Initiative (GRI), we are providing verifiable proof that not only is sustainable behaviour of huge importance when it comes to maintaining our economic performance, it is also part of our DNA."

All of the activities are based on the "Sustainability@ Chiron Group" strategic program. The objective is to achieve fully carbon-neutral production throughout the world by the end of 2025.

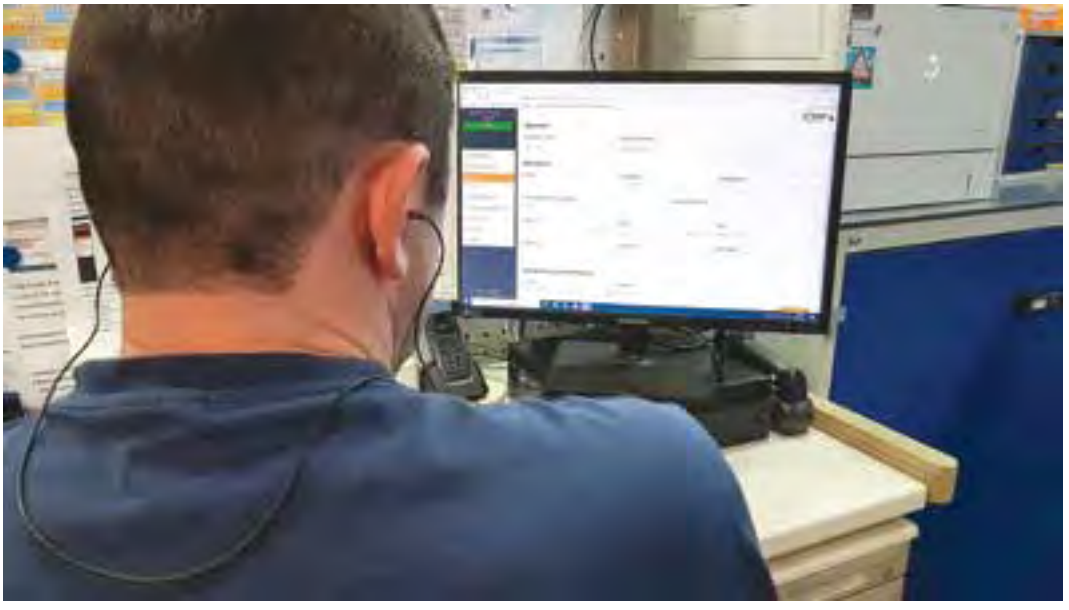
Benjamin Kurth explains that the Chiron Group has officially pledged its commitment to this ambitious project: "Since December 2022, we have been the first company in our industry to collaborate with the Science Based Target initiative (SBTi). This shows just how seriously we take sustainability."

The SBTi is a joint initiative undertaken by CDP, United Nations Global Compact, World Resources Institute and World Wide Fund for Nature (WWF). Its approach is to define emission reduction targets for the participating companies and to independently assess whether these have been met, with the ultimate aim of achieving the Paris Climate Agreement targets, namely to limit global warming to 1.5 °C.

For Benjamin Kurth, this commitment, alongside the first sustainability report, represents another significant milestone: "Now what matters is specifying our reduction targets in greater detail, achieving them in the projected time frame, and having their impact validated by the SBTi." Carsten Liske adds, "With 'Sustainability@Chiron Group', we have laid a solid foundation for making sustainability a strategic factor in our business model, for us and our customers. We are building on this and continuing with this approach – to make the Chiron Group carbon-neutral and, just as importantly, successful in the long term."

SMART SOLUTIONS FOR MANAGEMENT OF PROCESS WATER PARAMETERS

The case study throws light on how Rösler helped its client Scherdel Waldershof with a better process understanding and improved mass finishing results.



For economic and ecological reasons, the cleaning and recycling of the process water in mass finishing applications has become indispensable. The quality of the finishing results depends to a large extent on the effectiveness of the actual process water cleaning operation. To better manage the numerous parameters of its cleaning and recycling system, Scherdel, a globally operating manufacturer of bent and stamped parts, upgraded its semi-automatic Rösler cleaning centrifuge with the digital process water management software package from Rösler Smart Solutions. It allows the interactive control of up to 13 parameters such as compound concentration, pH value or microbiological contamination. In case of deviations from the rated values the intelligent software issues corrective recommendations to the operators.

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> Clean surfaces are essential for conducting a proper optical quality control. In this context the quality of the process water plays a key role.

In his very first diesel engine Rudolf Diesel used already springs from the Siegmund Scherdel wire drawing company founded in 1889. Since then, the company has evolved into a globally active operation that deals with forming, assembly and joining technologies as well as surface treatment. In addition, the company is also active in the manufacture of tooling and equipment. With 32 facilities around the world, Scherdel actively supports its customers with services that range from initial briefings to volume production. The result are premium products that are not only used in the automotive industry but also in medical and electrical engineering as well as power generation. The products include stamped and bent parts, lock washers and components for electric vehicles. The latter are

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Digital process water management results in transparency and generates knowhow. When Rösler suggested him to test the digital process water management system 'Advanced' from Rösler Smart Solutions as a pilot user, the department manager immediately agreed.

produced at the Scherdel Waldershof GmbH & Co. KG in Waldershof, Germany.

The components made from different steel alloys, stainless steel and non-ferrous metals frequently receive their final surface finish in mass finishing operations. Besides the basic finishing tasks like deburring and edge radiusing, clean surfaces with a high degree of cleanliness are an important requirement. Clean surfaces are essential for conducting a proper optical quality control. In this context the quality of the process water plays a key role.

PROCESS WATER CLEANING & RECYCLING: FOR COMPLEX MASS FINISHING

At Scherdel Waldershof, the process water from the mass finishing operation is cleaned and recycled with a semi-automatic centrifuge. However, to date the process water quality was only controlled by a daily check of the compound concentration. This was usually done by different people who had little understanding and knowledge of the intricacies of the process water cleaning and recycling operation. "The process water gets contaminated by oil from the stamped & bent parts, belt lubricants and metal and media fines. On the one hand this increases the conductivity, which can cause faulty readings during the optical controls. On the other hand, the guidelines regarding particle size and quantities were not always followed. All this resulted in costly rework and even scrap parts," explained Tobias König, Department Manager for Mass Finishing & Cleaning at Scherdel Waldershof.

Digital process water management results in transparency and generates knowhow. When Rösler suggested him to test the digital process water management system 'Advanced' from Rösler Smart Solutions as a pilot user, the department manager immediately agreed. This new software package for semi-automatic and fully automatic centrifuges allows the user-friendly monitoring, recording and evaluation of all essential process parameters. These are: the compound concentration (measured by titration or refraction index – BRIX), pH value, conductivity, water hardness, microbiological contamination by bacteria, yeast and fungi, chloride content, COD value (chemical oxygen demand), BIT content (biocides in the process water), appearance and smell. Depending on the particular requirements for a given mass finishing process, the respective process parameters can be individually selected. In the 'Advanced' version of the digital system the water samples are manually collected and analysed with suitable measuring equipment that can be supplied by Rösler with the software package. The determined values are also entered manually. Based on the entered data the algorithm in the software develops recommendations for immediate corrective actions so that deviations from the specified values for the respective process parameters can be corrected and, thus, ensure process stability. Besides the recommendations for immediate corrective action, the software also provides information that explains the adverse effects on the work piece surface, if the various parameter deviations are not quickly corrected.

> The digital system issues not only offer recommendations for corrective actions when the parameters deviate from their rated values but also proposed similar actions in case of events affecting the part quality and downstream manufacturing operations like corrosion, excessive foaming during the mass finishing process and insufficient cleanliness of the work pieces.

Since all data are recorded, they can be retrieved and displayed in the form of tables and time charts. This helps prevent costly downtimes by unplanned process water changes and allows to schedule such changes for time periods when they are less disruptive.

"When Rösler presented the digital process water management system, we immediately recognised its potential for more transparency and a higher process stability. In addition, we realised that the recommended corrective actions along with the respective background information can be a tremendous educational tool that helps to increase the process knowledge of our employees," concluded König.

INCREASED PROCESS STABILITY & IMPROVED FINISHING QUALITY

Scherdel Waldershof uses the digital process water management system with a semi-automatic Rösler centrifuge, model Z 800. This centrifuge cleans and recycles the process water from a Rösler mass finishing vibrator (model R 620) running in three shifts. The system controls the compound concentration and the pH value once per shift. A conductivity measurement takes place once per week. The microbiological contamination is checked whenever required. For example, this is the case, when the regularly monitored appearance and smell of the process water indicate that there might be a problem. The department manager explained, "The measurement and recording of the parameter values is easy and simple. We need about the same time for measuring and recording the compound concentration and the pH value as before." He continued, "However, today we automatically receive an easy-to-read evaluation and a list of corrective actions that can be immediately implemented. This is a valuable tool to keep the process water stable and maintain a consistently high part quality. We have seen a reduction of rework and scrap parts by up to 50 per cent."

The digital system issues not only offer recommendations for corrective actions when the parameters deviate from their rated values but also proposed similar actions in case of events affecting the part quality and downstream manufacturing operations like corrosion, excessive foaming during the mass finishing process and insufficient cleanliness of the work pieces. To eliminate such problems, the digital system issues detailed background explanations along with the recommended corrective actions. König concluded, "Most of the employees in my department have no special knowledge regarding mass finishing and handling of the process water. However, with the recommended corrective actions they not only learn what needs to be done, but they also acquire valuable process knowledge. This helps them understanding the relationship between the process water quality and the quality of the finished work pieces."

Courtesy: Rösler Oberflächentechnik GmbH

By Gaurav Bawa, Managing Director & Senior Vice President, WIKA India

PLUG & PLAY MAKING SMART MANUFACTURING AFFORDABLE

The article elaborates on how implementation of interoperability in smart manufacturing will help make production process affordable and smoother.

Technology and its effective implementation are the biggest game winner for any businesses today—be it service or manufacturing. The positive returns to cost in case of technology orientation is by far stronger than the incurred expenditure. But at the same time, it has to be acknowledged that technology is changing much faster than expected, thus making it difficult for the enterprises to remain up to date with the current innovations.

ENABLING WIDER ADAPTION OF SMART MACHINE TOOLS

The long lifespan of industrial machinery and the high perceived costs associated with purchasing smart technologies is essentially making manufacturers reluctant to take advantage of the Industrial Internet of Things (IIoT). The focus on innovative plug & play tooling that can be adjusted and synchronised with multiple machines in reality ushers in the 'global production language', that enables communicating machines seamlessly with standardised specifications.

Gaurav Bawa

The interoperable interfaces for intelligent production are a function of the smart machine tools that not only help precision outcomes but also use intelligent sensors for accurate measurements. It represents a major milestone for the machine tool industry where the wider adaptions of smart technology will help broaden the market.

A parallel example that can be drawn is the discussion and innovation happening around interoperability among vehicles, devices, and infrastructure to support widespread deployment of transportation innovation. It has been identified that interoperability is critical for transforming safety in transportation. Not only the US, but even in India the unified logistics vision along with smart vehicles and state-of-the-art infrastructure is slowly getting adapted to the vision.

For the interoperability

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The growing trend to 'smarten' up production facilities and integrate Industry 4.0 technology is expected to have responsible output characteristics like remote monitoring and predictive maintenance if the machine tool industry can ensure global production language.

standardisation to happen across board, the research entailed collaboration with a wide range of stakeholders, including device manufacturers, application developers, architecture, standards & certification experts, and implementers & future users at both the domestic and international levels. That was only way to reduce accidents, introduce e-vehicles on longer routes, transform national highways of India into NH for EVs apart from addressing all the security issues that are generally found on roads. The smart-mapping of vehicles connected to other infrastructure of smart city helped standardise the machine tools used, creating a seamless platform for data exchange between machines.

VDMA, one of the most respected voices in mechanical engineering industry that represents thousands of EU industries, has claimed that with more than 50 standards that has already been implemented in manufacturing and more than 500 companies working towards standardisation, it will be a matter of time before machine tool specifications becomes typical, making adaptability and smart production easier.

Germany being the leader in technology and leading the efforts in 'The Interoperable Interfaces for Intelligent Production project', it is supported by German Federal Ministry of Economics and Technology (BMWI), which aims to promote the development of cross-sector OPC UA standards and the publication thereof. The project being conducted under the aegis of Mechanical Engineering Industry Association (VDMA), is scheduled to run from February 2020 to January 2023. Thus, we expect some updates on interoperability by next calendar year which can be implemented across the industry irrespective of the geography that they are operating in.

LEVERAGING RIGOROUS IMPLEMENTATION OF PREDICTIVE MAINTENANCE & CIRCULARITY

The growing trend to 'smarten' up production facilities and integrate Industry 4.0 technology is expected to have responsible output characteristics like remote monitoring and predictive maintenance if the machine tool industry can ensure global production language. The processes will also become accessible for even medium and small players through introduction of plug and play devices. When ensuring compatibility of machine tools and supply of parts will not remain a major concern, the plant managers will be more in tune with predictive maintenance ensuring safety in production processes and minimum break-down time.

Interoperability of machine tools will ensure a steady supply of parts and minimum time for replacement. Plug and play will become a reality for machines in the truest sense with every machine tool having globally specified manufacturing template. Differentiation between parts do spike up business volume but use cases has indicated that the biggest impact is led by easy availability and comfort to use. Interoperability will push the way for implementation and installation of smart gadgets, so as to transform the entire ecosystem into a 'smarter' production hub. The consistency and efficiency of the standardisation of interfaces along the entire industrial value-adding chain will increase.

Not only the process is essential to saving costs and ensuring profit, in addition it also help preserve resources that furthers the cause of economic circularity. Digital enhancements or entrepreneurial responses to climate change begins with minimisation of wastage of resources and defined standards for machine tools will certainly ensure the cogs of sustainability in manufacturing to fall in place.

LOOKING AHEAD

According to the OECD (Organization for Economic Co-operation and Development), global consumption of raw

> The industry today not only looks at strategic solutions like plug and play machine tooling and standardisation quotient, but comprehensive solutions to maintaining products, components and materials at their highest use and value, extending life cycles and thus reducing waste and resource consumption.

materials almost tripled between 1970 and 2017 and will almost double again by 2060, and in tune with the demand the natural resources will be depleted. The industry today not only looks at strategic solutions like plug and play machine tooling and standardisation quotient, but comprehensive solutions to maintaining products, components and materials at their highest use and value, extending life cycles and thus reducing waste and resource consumption.

The commonly applied three "R's" in terms of sustainability speaks of reduce, repair, reuse. For machine tooling industry we can safely introduce 'rethink' in terms of design and 'refurbish' in terms of standardisation of machine tools. Introduction and acceptance of standards for interoperable interfaces between machine tools and different machines will integrate the 'reduce' part as well.

The strength that machine tools industry provides to manufacturing will offer both an opportunity and a challenge – as a user of resources for the machines themselves, but also as a solution provider for the manufacture of sustainable products, consequently providing the optimum circularity.

WHAT DOES IT MEAN FOR INDIA?

According to Mordor Intelligence, the Indian industrial automation market was valued at $10.72 billion in 2021, and it is expected to reach $23.09 billion by 2027, at a CAGR of 14.26 per cent over the forecast period (2022 - 2027). The two policies governing the unprecedented acceptance of technology implementation across the manufacturing lines turning them successfully into smart manufacturing hubs are:

(a) The target to achieve reduction of the carbon intensity of the economy by 45 per cent by 2030 and Net Zero status by 2070 as committed in COP26

(b) The drive to remain competitive in the export market and imbibe the best manufacturing practices

As the industrial automation is expected to pick up post covid-19, the standardisation of machine tools and interoperability interface, if accepted, will save cost, resources and time of refurbishments. Also, with a scattered economy like India, it will become so much easier to smarten up the entire manufacturing activity.

Successful implementation of interoperability in smart manufacturing will inadvertently result in effective communication and minimise the normally error-prone data-exchange. As machines, sensors, actuators, users, systems, and platforms synchronises and act together, it will also offer the smartest solutions. The implementation of artificial intelligence, 5G, and 3D printing/additive manufacturing along with the smart hardware is also expected not only to provide more significant growth opportunities but also 'clean and responsible' evolution process, bringing India much close to its environment friendly goal.

INDUSTRY 4.0: INDIA INC. EMBRACES LEVERAGING ADVANCED TECH FOR ENABLING SMART MANUFACTURING

Delhi and Chennai, December, 2022: The advent of digitization has encompassed practically every traditional sector and led to a technology-backed transformation that has ensued into a 360-degree overhaul. The adoption of intelligent technologies, the use of digital strategies, the shift from a linear economy to a circular economy, and the evolution of post-pandemic government industrial strategies are key drivers that will accelerate the creation of new industrial hubs, redefining the future of manufacturing and our understanding of global supply chains. Deliberating and exploring the way forward in the digital evolution of the Indian manufacturing landscape, **ET Edge, an initiative of The Economic Times organized the 2nd Edition of The Economic Times Industry 4.0 Summit 2022: `Smart Factories for a Smart Future`** on 1st December 2022 at Holiday Inn, New Delhi and on 14th December 2022 at Hilton, Chennai, respectively.

The summit witnessed an impressive gathering of industry leaders, decision-makers, and innovators coming together at one common platform to discuss and underlined the advantages and importance of using technology to make products for the global markets at competitive rates and to embrace 4.0 technology with the latest technological advancements.

Opening the dialogue, **Vinit Goenka, Governing Council Member, Centre for Railway Information System (CRIS), Ministry of Railways, Govt. of India** stressed on balancing the simplicity of innovations to solve major problems. He said, "The simplest technology innovation can solve some of the major problems in the world."

Accentuating the need for upskilling for right-scaling, **Kundan Kumar, Adviser, NITI Aayog** said "We need to be skillful in terms of size, pace, and standard in addition to our other skills"

Tamil Nadu Chief Minister MK Stalin believes that introducing advanced technologies and professional 4.0 standards in production will pave the way for further refining the industrial environment in the State. The government is keen on preparing MSMEs to acclimatize to the technological changes with the government providing advanced technologies to students, professionals, and young entrepreneurs. Speaking on Tamil Nadu's readiness to embrace Industry 4.0, **S. Krishnan, IAS, Additional Chief Secretary to Government, Industries, Investment Promotion, and Commerce Department, Government of Tamil Nadu** said "Tamil Nadu tops the list of most industrialized states in India. Being a large manufacturing destination along with an equally large manufacturing force in the country and need to stay at the forefront of the manufacturing story. The complete history of manufacturing may change in multiple ways. With that objective in mind, the state is conscious and serious about staying at the forefront of the Industry 4.0 movement. For this, we must have

the right-skilled workforce, the right companies, investing in the right kind of companies in years to come to stay at the forefront and for this, we need to work with the right industry partners. Tamil Nadu aims to be the hub for advanced manufacturing in the years to come."

There is increased stakeholder pressure for businesses to focus on sustainability. As per industry reports, digital transformation serves as an accelerator of ESG initiatives. **A Sumathi S., Chief Operating Officer, Sterlite Copper, Vedanta Limited** said "We see ESG as an opportunity. From a journey starting with compliance and culminating in leadership, we have seen many efficiency improvement opportunities. It is well-integrated into our business, today. It is a good opportunity for us concerning a sustainable future."

With the advent of Industry 4.0 and smart factories, digital manufacturing technologies have been experiencing exponential technological growth. **Rajkumar Ravuri, Director and Manufacturing Industry Advisor, Salesforce-India** said, "The three tenets of successful digital manufacturing include customer-centric disciplines, an execution framework, and a platform for growth and innovation."

The customer experience (CX) is becoming a progressively deliberate part of any company's brand as businesses become more and more customer-centric. **Sreenivas Pamidimukkala, Chief Information Officer, Mahindra Logistics** said "The barriers to technology are breaking. The industry is acclimatizing to growing customer demands as they embrace technology. It's important to bring efficiency with help of digitization to serve your customers in a much-enhanced way."

Discussing the way forward ahead in terms of Industry 4.0, the eminent panelist also made a point to deliberate in the direction of the next phase of digital transformation i.e. Industry 5.0: The Future of Manufacturing. The factory of 2035 will look vastly different than the factory of today.

Ankur Goyal, Associate Director - Industrial Sector, IBM said "Industry 4.0 is about smart decisions based on available data. In my view, Industry 5.0 will be about giving back to society in terms of sustainability and we are nearing the next phase quite rapidly. There is a lot of convergence of technology that is happening. All these are getting affordable and implemented on the shop floor. It is all about achieving business objectives with help of evolving technology."

Manjunath Prasad, Vice President – ITS, TVS Mobility said "The objectives of the business are evolving. We are focusing on customer experience through digital transformation. With IoT, it's important to manage data, and we have adopted cloud strategies to manage it well. The possibilities are endless with huge data availability.

In the next phase of the revolution, Industry 5.0 is projected to bring about human-machines/robotics co-working dynamics aimed at maximized automation and minimal human interaction. This relationship will be instrumental in transitioning existing smart factories to a lights-out factories.

The next edition of The Economic Times Industry 4.0 Summit 2023: `Smart Factories for a Smart Future` will be held on 8th February 2023 at Pune, Maharashtra.

By Dick Bussiere, Technical Director for APAC, Tenable

SECURING INDUSTRIAL ENVIRONMENTS: NOT AN OPTION, A NECESSITY

With the growing threat of cyber invasion, having an end-to-end secure industrial environment is pivotal. The article elaborates on how manufacturing plants can secure their digital set-up effectively and why it is need of the hour.

Industry 4.0 has been the buzzword among Indian manufacturers since they began their digitisation journey. A recent NASSCOM study found that 50 per cent of the tech spend by Indian manufacturers is on Industry 4.0 technologies amounting to $11.7 billion. And in the next 18-24 months, these manufacturers plan to increase investments in emerging network tech, big data analytics, central and remote-controlled monitoring, and automation. New methods of connectivity, external influences, new software development practices, and rapid cloud adoption have blurred the lines between IT and OT. The widespread digitisation of industrial systems and the desire to connect and automate everything is now an unshakable reality. While it has increased the operational efficiency manifold, it also increased the attack surface of industrial environments.

And yet, the longstanding issue is that industrial environments still lag behind when it comes to maintaining cyber hygiene. This is because some organizations have not prioritised cybersecurity and are largely blind to unsecured environments being a strategic business risk. Historically, these organisations haven't had to think of interconnectivity or digitisation and the strategic business risks they pose, and they also haven't been regulated with cybersecurity in mind.

In the existing circumstances, the sheer volume of data and assets has become an exposure risk. Shadow IT, public cloud, ephemeral assets, distributed infrastructure and app deployments have made the attack surface transient. Its perhaps why manufacturers struggle to deal with the intersectionality of IT and OT infrastructure and face vulnerability overload. They have no way of knowing when changes are made to the environment and cannot detect active attacks.

For instance, solar power units in homes are generally maintained by third-party organisations. Any manipulation by bad actors would cause solar power operators of critical power infrastructure to make inaccurate decisions. Insecure industrial environments have the ability to impact daily life. With remote work becoming the new normal, employees too could become victims of phishing attacks, leading to production disruptions or safety issues when critical infrastructure is accessed remotely. This will result in costly and lasting reputational damage.

EXISTING REGULATIONS CANNOT BE THE ONLY CYBERSECURITY INITIATIVES

The cybersecurity controls deployed by any organisation

are generally subject to governmental regulations. In India, the Information Technology (Amendment) Act 2008 and various rules such as the Information Technology (Information Security Practices and Procedures for Protected System) Rules, 2018 govern cybersecurity mandates for organisations. These regulations must be viewed as a guide to cybersecurity and not the end goal as every industrial environment is different, requiring different security strategies, solutions and protocols.

The compliance-driven view to cybersecurity is why attackers are still successful because there persist gaps in coverage, unenforced security policies, and poorly secured intersections between IT and OT infrastructure, not to mention exterior networks.

Besides, cybercriminals are increasingly successful because many of the systems within the OT world are unpatched, or unsupported. It is such weaknesses that threat actors look for to perpetrate malicious activities.

In addition, many OT networks operate on a system of trust, where any object on the network is implicitly trusted just because it's there. As industrial environments are air-gapped, it is perceived that the facility is safe, when in reality, the interconnectedness of IT and OT make air gaps irrelevant. With little to no vertical security measures within most industrial environments, an attack entering one point of the plant will also propagate to other sections. If no monitoring is present, the attack will go unnoticed until it's too late.

HOW TO SECURE DIGITISED OT ENVIRONMENT

The first step is to take a full inventory of all assets of all types, firmware version, patch level, state, configuration, software present on each device and vulnerability positions of everything that's present within the OT infrastructure. This includes "Commercial Off the Shelf (COTS)" operating systems such as Windows or Linux, which serve as platforms for Digital Control Systems or Human Machine Interfaces.

This inventory of vulnerabilities, misconfigurations, and identity access of all assets within the OT environment is critical because organizations cannot defend what they cannot see. Organisations must also baseline communication patterns to understand what is normal so suspicious activities can be spotted. This is important because within an OT environment, communications are predictable and use a finite number of OT-specific protocols.

Once the inventory is done, these assets, users, systems and networks must be constantly monitored as no environment remains the same all the time. Continuous monitoring will give organisations a clear picture of what their environment looks like and the ability to identify changes in configurations as it could be an indication of a cyberattack. OT organisations also require real-time alerting capabilities and audit trails both for security and compliance purposes.

While digital transformation may not seem new to IT teams, it is relatively new for manufacturers. The last two years have seen a major revamp with cloud adoption, remote work and more to keep operations going. But the scale of interconnectedness between OT and IT systems is a new phenomenon which requires updating legacy systems with modern solutions. While manufacturers and critical infrastructure operators navigate these rapid changes, they must bear in mind the increased risk in the process. This places more importance on ensuring OT must be secured the same way IT would be. But more importantly, cybersecurity is now a necessity for the safe functioning of industrial systems.

APPLYING LOGIQ TO DRILLING

Figure 1

Figure 2

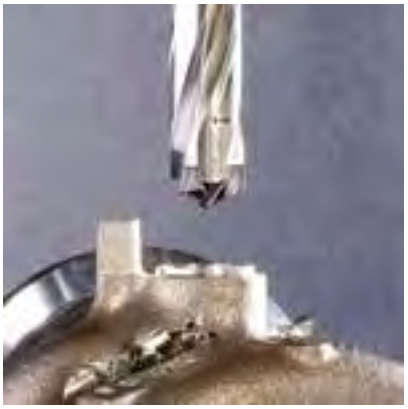

Figure 3

Iscar's recently launched Logiq campaign introduced new families of cutting tools targeted to address challenges in metalworking, from increasing efficiency and developing cost-beneficial small-size tool solutions to reducing machining vibrations. One of the issues confronting Iscar's specialists was: how to increase productivity in drilling? Although a traditional approach, based solely on advanced cutting geometry and progressive tool materials, can result in some improvements in productivity, it is still far from a dramatic change. A significant breakthrough calls for another concept.

The development of the Logiq3Cham family of drills with exchangeable heads offers a solution to this challenge. The drills feature heads with three flutes instead of two, which is the standard number in a drill design. As a result, machine cycle times can be reduced by up to 50 per cent when compared to the conventional two-flute drills. The idea looks logical and simple - more flutes means more feed speed, which leads to higher productivity. However, a translation of this idea into action is not as easy as it may seem; ISCAR's engineers had to solve several complex tasks to design a robust and reliable three-flute drill.

An increase in metal removal rates leads to a subsequent growth in cutting forces. This means that the drill's chisel point must be capable of withstanding high cutting forces. To ensure a stable drilling process, the drill should enable good centering and smooth penetration into the material. When compared to a two-flute drill, a three-flute drill of the same nominal diameter generates a smaller flute area for chip evacuation. Therefore, another important design requirement for the new drill is to enable efficient chip formation and unconstrained chip flow.

An additional method of improving productivity can be found by decreasing non-productive machine time. This can be achieved by significantly reducing the time lost in replacing a worn drill. Development of the Logiq3Cham line offers a good example of how to find and implement effective solutions for these challenges.

The cutting element of a Logq3Cham drill is a three-flute exchangeable head H3P, made from cemented carbide. The head, which features a durable and precise chisel point combined with an appropriate gash angle, successfully stands against a heavy cutting load. Iscar's latest research and development projects for high-performance two-flute drills brought an unusual concave shape of cutting edges. The resemblance of the shape to a pagoda profile even generated the shoptalk term: 'a pagoda edge'. The concave cutting edges result in smooth and stable drilling. Following the logic of this successful design, the pagoda shape was integrated into the new three-flute head.

In the Logiq3Cham drills, the concave shape of the head edge significantly contributes to generating the optimal chip form and makes chip evacuation process easy. In addition, the 15° corner chamfer improves wear resistance and strengthens the head cutting corner. A dovetail clamping concept prevents the head from being extracted from its pocket in a drill body during retraction.

The head clamping method, which provides face contact between a head and a drill body, ensures the realization of the 'no setup time' principle that already characterises several Iscar tool families. According to this principle, replacing a worn head does not require any additional set-up procedure and may be done when a drill is mounted in a machine tool spindle. This capability significantly decreases the unproductive time component in a cycle time.

A Logiq3Cham drill body that carries an H3P head has its own specific features. In designing the drill body, Iscar's tool engineers faced some difficulties caused by the three-flute concept. The growth in metal removal rate necessitated a proportionate increase in flute volume to ensure an unconstrained chip flow. However, this was shown to reduce body strength and stiffness when compared with a two-flute design of the same diameter and therefore a non-standard solution was required. Finite element modelling assisted in identifying a solution: a variable flute helix angle, which provides a durable body structure to resist a high axial load and improve the body's dynamic rigidity. A helical margin prevents chip adhesion between the body and the drilled hole.

The head pocket enables a large face contact surface, which spreads out the pressure during machining. The pocket is designed to avoid plastic deformation and increase heat resistance, so prolonging pocket tool life even in difficult conditions.

Iscar's "Logiq" approach has combined the advantages of a pagoda-shaped cutting edge, reliable head clamping method, and a specially designed drill body with its "no setup time" concept to provide an extremely efficient tool for high-performance drilling in a diameter range of 12 to 25.9 millimeters - 0.472 to 1.02 inches.

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