VOL 2, ISSUE 6 - MARCH-APRIL 2019

MODERN MANUFACTURING INDIA

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The Official Magazine of
IMTMA
Indian Machine Tool Manufacturers' Association
In Association with
Modern Machine Shop

ROBOTS & AUTOMATION
Boosting Efficiency 38

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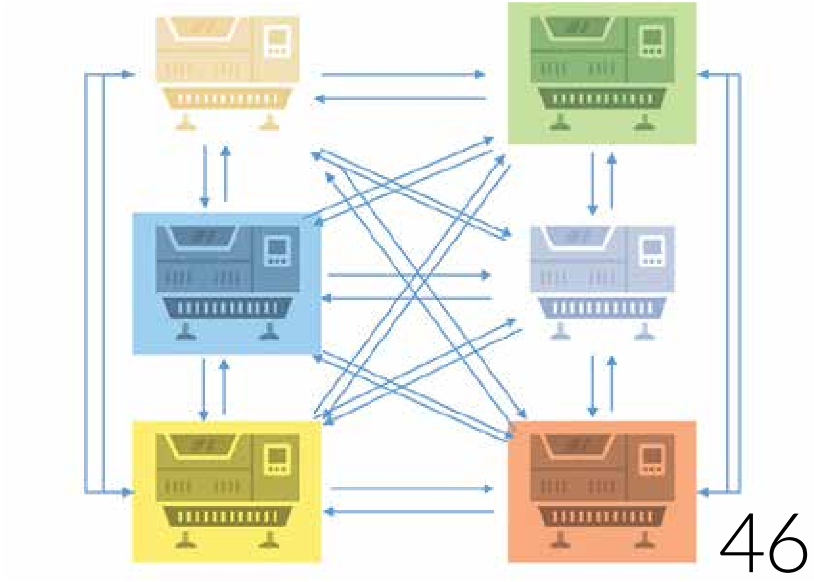

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PUBLISHER &
DIRECTOR GENERAL & CEO, IMTMA
V Anbu

EDITORIAL
Editor-in-Chief
Soumi Mitra

Chief Copy Editor
Poonam Pednekar

Correspondent
Arunima Nath

Design
Magic Wand Media

SALES & MARKETING
Indian Machine Tool Manufacturers' Association (IMTMA)

Murali Sundaram, Magic Wand Media Inc
murali.sundaram@magicwandmedia.in

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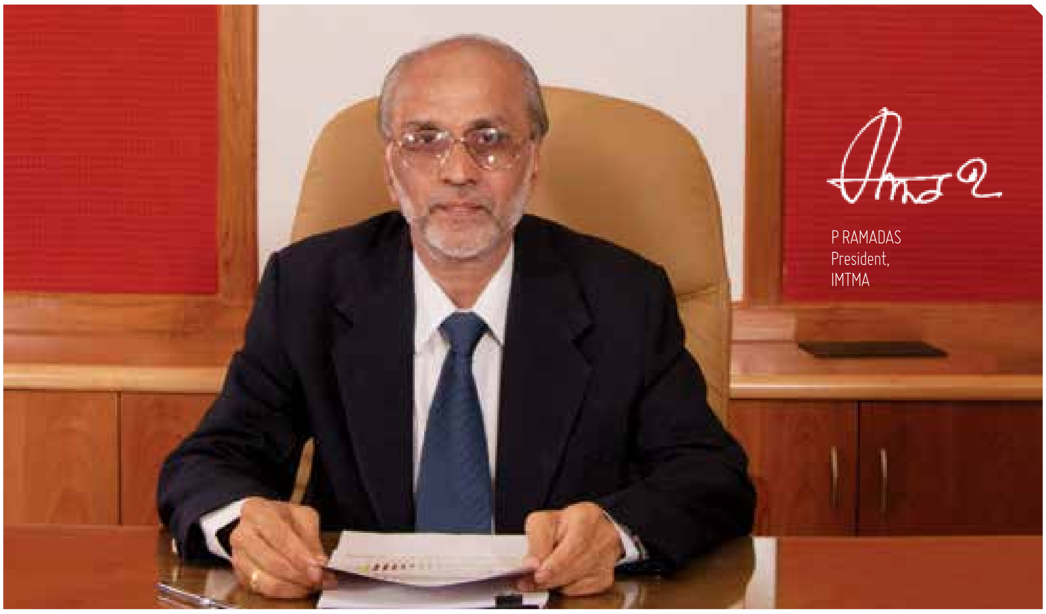

INDUSTRY 4.0: FUTURE OF MANUFACTURING

Digital technologies are significantly changing the landscape of manufacturing ecosystem. They are changing the dynamics of traditional manufacturing sharply. Industries are keen to deploy these technologies on their shop-floors to align with the changing requirements of their customers.

The reliance on information- and communication-based technologies for factory purposes has evolved over a period of time and is expected to amplify in the years to come with many more technologies being added to the ones we see now. Industry 4.0, which involves integration of software systems into production and logistics as well as the use of the Internet of Things (IoT) in processes and systems, is ushering in a favorable transformation in the world of manufacturing.

Indian Machine Tool Manufacturers' Association (IMTMA) recently celebrated 50 years of its flagship IMTEX exhibition in Bangalore. As a new initiative, the Association introduced a special pavilion as well as organized a seminar on 'Factory of the Future: Industry 4.0'. The primary goal was to increase the awareness on the significant opportunities and challenges of Industry 4.0 in manufacturing. The special pavilion and seminar provided visitors a holistic understanding of the importance of IT infrastructure, Data Security, and IoT.

IMTMA also organized a 'Live Demo' on Industry 4.0 during IMTEX 2019 & Tooltech 2019 at its Technology Center, BIEC. A model smart factory has been set up at IMTMA Technology Center where CNC Turning Centers, CNC Machining Centers, Digital Height Gauges and CMM machines are digitally connected and monitored in real time. The real-time data is acquired through data acquisition devices and CNC controls.

The Association will continue to project the machine tool industry and the new age technologies as key enablers for manufacturing excellence besides striving to make the industry a global player. I call upon the industry to support IMTMA's initiatives by providing feedback which will guide us in our journey to make the manufacturing sector competitive.

Wishing you all a Happy Reading.

P RAMADAS
President
Indian Machine Tool Manufacturers' Association (IMTMA)

Dear MMI Readers,

Technological upgradation and willingness to learn what is new and emerging and unlearn what has become obsolete is what helps the manufacturing industry move ahead in the changing times. As the industry braces up to meet the needs of its customers it becomes apparent to invest in the right areas for fruitful results.

Modern Manufacturing India (MMI) magazine continues to earnestly strive in reaching out to the core manufacturing sector. MMI, through its articles, interviews and opinion pieces, brings the latest happenings from across the globe to your desk. The case studies which are featured in the magazine enable manufacturers to replicate the success stories in their production processes.

In this edition of the magazine, we bring a first-hand account of how automation and robotics are changing the dynamics of manufacturing. The issue features an article by IMTMA on Industry 4.0 which is already digitally revolutionizing the shop-floor.

I thank you for your continued interest in the activities of our Association and request you to provide us your feedback which will be beneficial for us to improve further as we move along.

I hope that you cherish the time you spend with MMI. Thank you once again for your support.

V ANBU
DIRECTOR GENERAL & CEO
IMTMA

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EMBRACING CHALLENGES, CREATING OPPORTUNITIES

Flipping through the new language books of my nephew I chanced upon a story of a successful businessman who would sell combs in China. As he was growing old, he wished to hand over the reins to sagacious hands. Hence, the three sons were summoned and asked to sell combs in a nearby Buddhist monastery. Bewildered at the prospect of selling combs to bald monks, they nevertheless took up the challenge.

Two days later, the eldest son reported of having sold five combs to the monks by convincing them how it could serve them as an efficient tool to scratch their backs. The second son approached a week later beaming and recounting his experience of having sold fifty combs to the monks. He had made them understand how the combs would help the visitors brush their ruffled hair before entering the monastery. Finally, the youngest son turned up with a whopping sales figure of a thousand combs and disclosed to the overwhelmed father how he did it. He had convinced the monks that if the sermons were printed on combs and offered to the pilgrims, their teachings would be read by them every day since combs are used on a daily basis. The idea struck a chord with them, and earned him a huge business.

> *"If you do not see light at the end of the tunnel, consider it an opportunity to create an opening yourself, wherever you want."*

The above parable reflects that innovation is the process of turning ideas into a manufacturable and marketable form. To attest to this, we will be presenting, from this issue onwards, success stories of SMEs that have risen on the basis of their innovative ideas despite their challenges and fierce competition from the already established players.

Wish you all an engaging read and solicit your valuable feedback as that is what has made MMI what it is today!

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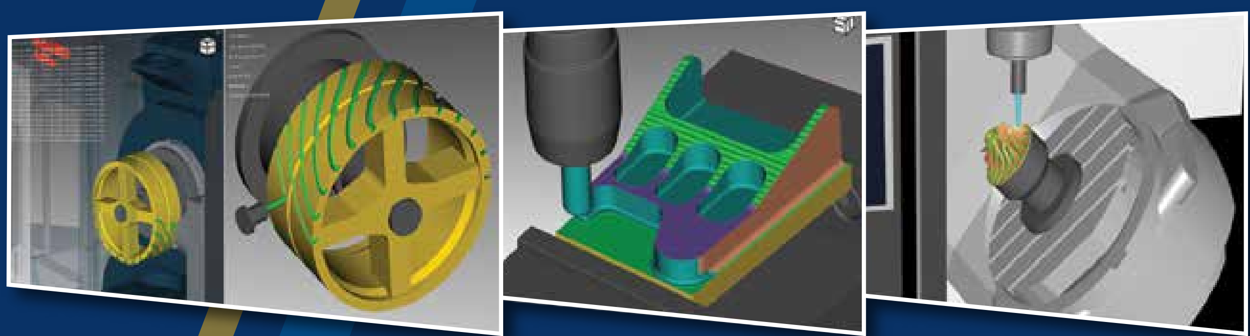

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INDUSTRY 4.0: DRIVING MANUFACTURING FORWARD

For the Indian manufacturing industry to evolve and get at par with its global peers, it is highly crucial that its players – big, medium, small – embrace Industry 4.0, the current trend of automation and data exchange. Indian Machine Tool Manufacturers' Association (IMTMA), in the 50th year of its flagship event IMTEX, endeavored to reach out to the industry to help raise awareness on its significance.

Source: Magic Wand Media

Industries in India are faced with the challenge of meeting the ever-changing requirements of its customers. Factories, to cater to the demands, are ramping up their shop-floor activities by deploying Artificial Intelligence, Automation, Robotics, Big Data, Internet of Things (IoT), and so on in their manufacturing process. This will help Indian manufacturing industry compete with the best in the globe.

Making the next move

Among these technologies, Industry 4.0 is influencing the process chain in two significant ways i.e. in terms of technology and engineering, and data flow. IoT has been transforming lives and aiding manufacturers to build a momentum for achieving a manifold growth in the years to come.

The advent of Industry 4.0 has led to the birth of smart machines. A lot of thinking features have been introduced into them that minimize human intervention. They are able to take care of predictive maintenance, prescriptive maintenance, storing of information for future usage, etc. This has led to transparency in production process as real-time data is available on the fingertips of senior management, middle-level management, and machine operators in factory premises without any blockages.

The deployment of intelligent machines and automated processes create a significant impact on the production as we set up 'smart factories'. Real-time production happens as utilization capacity is optimized with shorter lead times and avoidance of standstills. Production is getting decentralized as machines self-organize. Individualization of production depending upon customer requirements also happens. Manufacturing is turning 'smart'. The concept of 'smart manufacturing' first came to light at Hannover Messe fair in 2011 and is now gaining popularity across continents. It is heralding a new way of organizing the means of production.

In these 'smart factories' everything is connected. There is a constant interaction between products and machines as well as between machines and machines. Humans, machines and materials are all linked together on a network, which, in turn, is connected to outside world. There is a seamless communication, the overall objective of which is to convert data into information and knowledge in real time to make the manufacturing process more productive and flexible besides ensuring quality.

IMTEX and Industry 4.0

IMTMA recently celebrated 50 years of its flagship IMTEX exhibition in Bangalore. As a new initiative, the Association introduced a pavilion as well as a seminar on 'Factory of the Future: Industry 4.0'. The primary goal was to increase the awareness on the significant opportunities and challenges of Industry 4.0 in manufacturing. The pavilion and seminar provided visitors a holistic understanding of the importance of IT infrastructure, Data Security, and IoT. The pavilion featured 32 exhibitors and the seminar was attended by 200 delegates.

IMTMA also organized a Live Demo on Industry 4.0 during IMTEX 2019 at its Technology Center. A model smart factory has been set up at IMTMA Technology Center where CNC Turning Centers, CNC Machining Centers, Digital Height Gauges and CMM machines are digitally connected and monitored in real time. The real-time data is acquired through data acquisition devices and CNC controls.

> **The advent of Industry 4.0 has led to the birth of smart machines. A lot of thinking features have been introduced into them that minimize human intervention. They are able to take care of predictive maintenance, prescriptive maintenance, storing of information for future usage, etc.**

The need for Industry 4.0

Industry 4.0 is a harbinger of change in manufacturing activities. Small and medium enterprises which dot India's manufacturing landscape need to make the most of its phenomenal opportunities. Advanced analytics will enable industries to enhance their production capacity and quality. This is so as with data analytics prediction will result in the prevention of defects. Robotics and automation will shorten production cycle, reduce the 'time to market' as well as result in more efficient utilization of resources. Digitization of numerous business processes can increase costs saving and enhance the experience of users as well as workers. IoT and connectivity of machine to people and machine to machine will tighten the supply chain and reduce the lead time. Entities can enhance their operating profits. The Government of India aims to increase the contribution of the manufacturing industry to around 25 percent of GDP and this will be possible only when the industry implements Industry 4.0 in all possible operations on the shop-floor.

U-Tech Utpadan's New Facility

Bangalore, Karnataka – U-Tech Utpadan, a part of the Bangalore-based ₹60 crore U-Tech Group, has opened a new modern assembly facility and a full-fledged fabrication shop. According to its agreement with Bharat Fritz Werner Ltd (BFW), the facility is to manufacture and supply Chip Conveyors and Coolant Systems that meet BFW's requirements. The project cost, over a crore of rupees, has been part financed by BFW under a soft loan arrangement. Under the 'JIT' model, U-Tech Utpadan will manufacture and stock BFW requirements, supplying the same to its production line just in time, reducing inventory costs. Being in the same city, the physical proximity of U-Tech Utpadan's new facility to the BFW manufacturing plant is slated to reduce transportation costs.

Source: U-Tech

Utpadan's newly constructed facility

Source: HMFI

(Second from left): Dr Wilfried Schäfer, Executive Director of the EMO organizer VDW, addressing media in India recently.

EMO Hannover Inching Closer

Hannover, Germany – The 22nd EMO will be opening its doors from September 16 – 21, 2019 in Hannover. Under the motto of 'Smart technologies driving tomorrow's production', the event will be showcasing the entire bandwidth of modern-day metalworking technology. 'IoT in Production' is a key focus of EMO Hannover 2019, hence it has been allotted a dedicated exhibition area. A special show has been arranged on 'Industry 4.0 area - smart solutions for your business' which will have innovative companies and renowned research institutes presenting their intelligent solutions aimed at boosting their customers' business success. "EMO Hannover 2019 has plenty to offer on all these topics. The EMO organizers will be complementing the exhibitors' offerings with a wide range of supporting events and special shows," said Dr Wilfried Schäfer, Executive Director of the EMO organizer VDW (German Machine Tool Builders' Association).

Source: Scania Commercial Vehicles India

Petr Novotny, Managing Director, Scania Commercial Vehicles India Pvt Ltd, addressing customers post launch of Central Parts Warehouse in Nagpur

Scania Launches Central Parts Warehouse

Nagpur, Maharashtra – Scania Commercial Vehicles India Pvt Ltd has announced the launch of a Central Parts Warehouse in Nagpur. Located at the zero-mile center of India, Scania's state-of-the-art warehouse is spread across 30,000 sq ft with over 8,500 stock keeping units and caters to Scania's off-road, on-road and engine products. Speaking on the occasion, Petr Novotny, Managing Director, Scania India, said, "India is an important market for us. The centralized warehouse in Nagpur is a part of the company's expansion strategy and reiterates our commitment to the country. We are confident that such strategic initiatives will further support Scania India's growth story." The warehouse is located in the Logistics Park at Kalmeshwar.

Source: FIBRO India

Dignitaries at the opening ceremony

FIBRO Boosts Local Manufacturing

Pune, Maharashtra – FIBRO recently inaugurated its second phase of Indian operations near Pune at the hands of Klemens Schmeiderer, Speaker, Board of LÄPPLE group and Jürgen Gurt, Managing Director, FIBRO GmbH, the part of LÄPPLE group. Having tested the success for standard parts in India, the Rotary Table business was delegated to FIBRO India as well in 2015. FIBRO management has now decided to start specific Rotary Table product business followed by local manufacturing. As a result, FIBRO India has constructed a plant primarily for Rotary Tables which was inaugurated recently. The attraction of the event was launching of a Webshop to aid customers to shop for the company products. FIBRO India also launched its 100 percent 'Made in India' Rotary Table for Automation, FIBROTOR ER 13.

Manufacturing PMI hits 14-month high

Owing increases in sales, output, and employment, Indian manufacturing activity has expanded to a 14-month high of 54.3 in February, according to a private sector survey. The Nikkei India Manufacturing Purchasing Managers' Index (PMI) recorded a strong reading of 53.9 in January too. A reading over 50 indicates an expansion in activity and one below 50 shows a contraction. "The Indian manufacturing sector made further progress midway through the final quarter of FY18, building on the accelerated upturn noted in January," Pollyanna De Lima, Principal Economist, IHS Markit, and author of the report, said. "Sharper growth in production and sales were matched by the establishment of new jobs," she added.

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3idea Technology

Position:

- Channel Sales Manager

Location:

- Mumbai

Key Requirements:

- BE / BTech / MBA
- 2 to 8 years of channel sales experience

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DesignTech Systems Ltd

Positions:

- Sales Engineer / Sr. Sales Engineer

Location:

- Bangalore

Key Requirements:

- BE / BTech (Mechanical)
- Previous experience in selling CAE - Ansys, Nastran, Abacus is a must
- 2 to 8 years of experience
- A go-getter attitude with a passion to learn and adopt new technologies

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Solar CNC Automation

Position:

- Sales Engineer

Location:

- Maharashtra (Key areas - Mumbai, Pune, Kolhapur)

Key Requirement:

- Candidates should be dynamic and result-oriented

Salary:

- Starts from ₹1.8 lakh per annum + incentives. Expenses, pertaining to sales activities, will be paid extra

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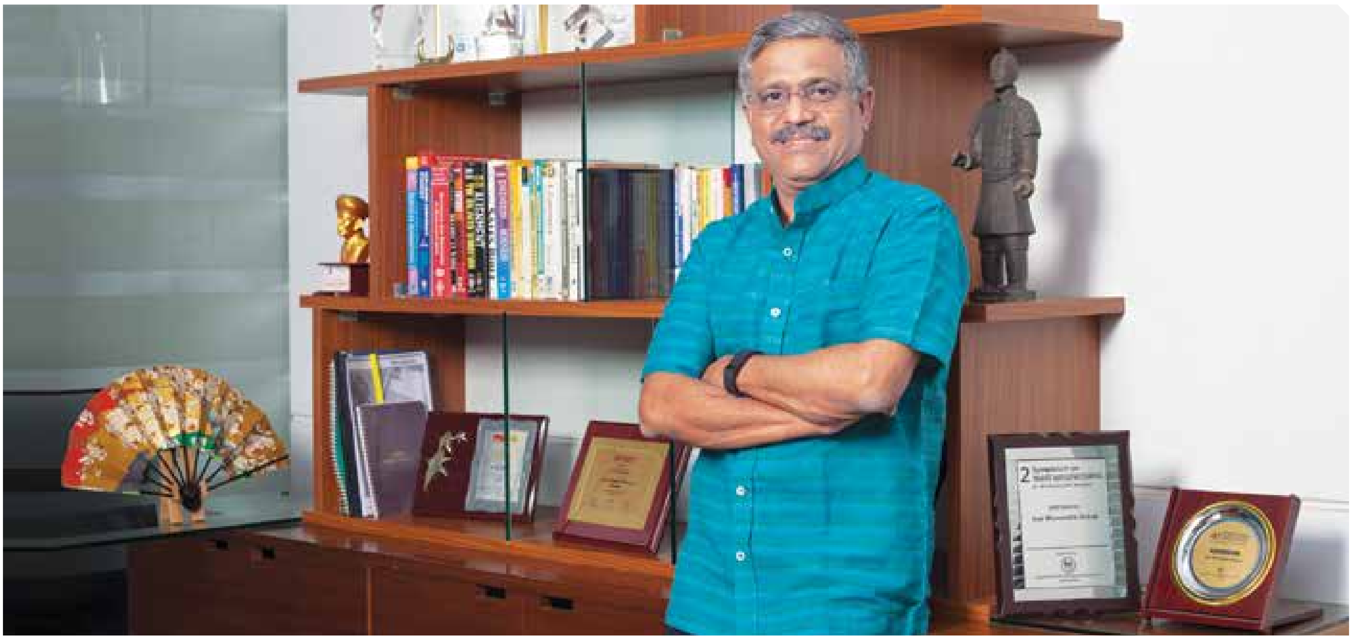


PAYING HEED TO SERVICE IN CAPITAL EQUIPMENT BUSINESS

In the capital equipment business there is always a huge component of service that is necessary to keep customers happy and ensure the performance of the equipment. This service components include installation, commissioning, tooling, process, set up, training etc. to get the equipment to start producing. There are also several life time costs like maintenance spares upgrades that are essential for the equipment to continue being productive throughout its life.

There exist umpteen opportunities for a win-win service business between customers and OEMs. However, many companies lose these revenue opportunities despite having the ability to provide the service. Hence, the revenue gets leaked out usually through a number of holes in their operations. Thus, service management is an important aspect of capturing revenue in the capital equipment business and earning customer delight.

> There exist umpteen opportunities for a win-win service business between customers and OEMs. However, many companies lose these revenue opportunities despite having the ability to provide the service.
>
> **T K RAMESH**
> **Managing Director and CEO**
> **Micromatic Machine Tools Pvt Ltd**

A few of the main leakages in service could be:

Installed base leakage. Having good systems for managing the installed base data and a proper incentivised channel is an important issue.

Discount leakage. For many manufacturers, actual discounts often exceed planned discounts. Discount leakage include a lack of clear discount policies, proper systems for enforcing discount policies, a management reporting summarizing of discount behaviour, and a corporate culture where discounts are an exception rather than a rule.

Competitor leakage. The root causes of competitor leakage include failing to provide good service, innovate on service offerings, provide differentiated offerings, price competitively, engage with customers in a timely manner, or differentiate effectively especially during competitive sales situations.

Channel leakage. Channel leakage include limited partner selling capabilities or capacity, limited economic upside for channel partners, poor systems, incentive programs, and channel politics.

Entitlement leakage. Do you have customers that are getting coverage for all of their equipment, when they have only purchased coverage for some of them? This is a fairly common form of leakage. The causes of entitlement leakage include not tracking entitlements at the serial number level, or failing to check a serial number during a service event.

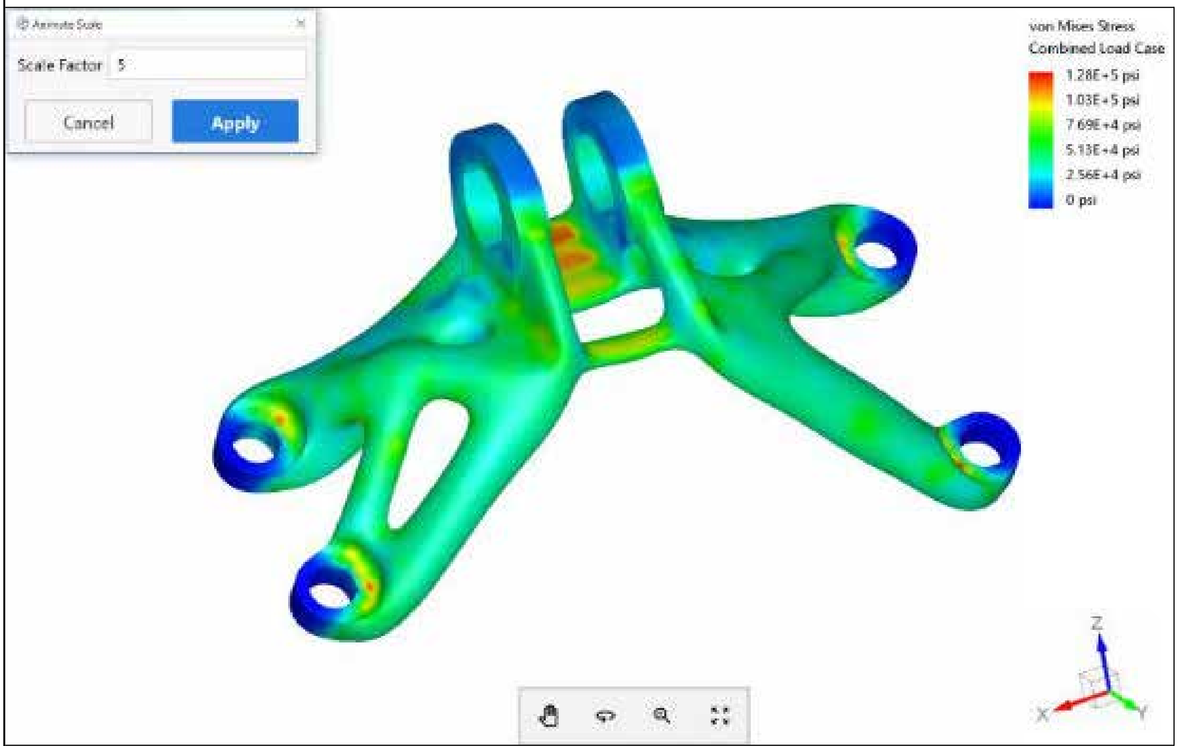
Up-sell and cross-sell leakage. Many companies are unable to effectively up-sell and cross-sell service agreements. This is because of not having appropriate up-sell and cross-sell incentives in place, and not having effective sales training.

Renewal leakage. Its root causes include outdated customer contact information, inability to identify new sales opportunities in a timely manner, slow quote creation and iteration processes, and a lack of management visibility into renewal opportunities and status.

The views expressed by the author are personal and he can be contacted at rameshtkr@gmail.com

ARTIFICIAL INTELLIGENCE: NOW AND THE ROAD AHEAD

Artificial Intelligence is the most talked-about topic, ensuing massive speculation on whether robots will rule the roost. A contemplation on the present scheme of things and of the days to come as this stream of science goes about redefining the relationship between humans and technology...



Source: PTC

Artificial Intelligence (AI) is an unavoidable topic today triggering an ongoing media frenzy of coverage and the ensuing public concern that current jobs will be overtaken by robots. Taking a step back, it is useful to identify the AI becoming widespread today versus the AI of tomorrow and recognize the practical business and societal problems it solves.

Artificial Narrow Intelligence (also known as ANI or Weak AI) refers to systems programmed to do a single task, whether it's playing chess, identifying early stages of a disease on an MRI scan or autonomously driving through an environment. While these tasks differ significantly in complexity and in advancements of AI techniques, they still fall under specific operational domains.

Artificial General Intelligence (AGI or Strong AI) is the machine equivalent of human intelligence where the AI is conscious, sentient and has emotions; this is typically the popular sci-fi representation of AI such as is in Ex-Machina, Her, iRobot and Westworld. There are more speculative levels of AI such as Artificial Super Intelligence, where the robot could outperform human intelligence in multiple domains and tasks, such as autonomously driving to a hospital to detect a patient's disease and later defeat a human in chess.

Although AI research has progressed immensely in the last few years, there will likely be some time before there is an AGI breakthrough; AI researchers speculate it could happen in 10 years or take over 100 years.

Source: PTC

The 'better together' story between humans and machines will continue to prosper; 67 percent of executives surveyed by PWC claim using both artificial and human intelligence creates a stronger value proposition.

AI replaces tasks, not work

There is substantial misconception about automation and AI replacing a job's task versus the job itself. As we know with ANI, a single task can be automated but people underestimate how many different and constantly changing tasks a typical worker experiences. McKinsey estimates that less then 5 percent of jobs consist of activities that are 100 percent automatable. The recurring theme is that increasing productivity through automating certain monotonous tasks creates net new jobs. For example, IDC forecasts that by 2023, 25 percent of leading retailers will have explored or deployed in-store robots to relieve human workers from repetitive tasks, thus increasing worker productivity by 40 percent. There will likely be some job displacement, but this can be solved by reskilling and upskilling programs improved by using innovative training tools such as augmented reality.

AI in practice is saving lives today

Advancements in complementary technologies such as cloud computing, sensors and processors is propelling AI research across industries unlocking use cases and solving problems once thought unsurmountable. Like most pieces of emerging technologies, the goal of AI is to solve actual challenges plaguing industries such as healthcare.

In the healthcare industry, there is a global shortage of medical personnel and, even in developed countries such as the US, there is estimated to be a shortage of up to 120,000 physicians by 2030.

Through emerging deep learning techniques based on artificial neural networks, AI can scale doctors' expertise to mitigate this skills gap as well as be a complementary tool to time-constrained medical professionals.

A deep-learning computer vision model called DeepGestalt was able to identify more than 215 genetic syndromes at 91 percent accuracy through its facial analysis framework. UC San Diego researchers used AI to analyze structured (health records, test results) and unstructured (hand-written notes) paediatric patient data to diagnose sinus infections at 95 percent accuracy, acute asthma with 97 percent accuracy, and mononucleosis at 90 percent accuracy.

AI saving lives does not take medical professionals out of the picture; Microsoft's Healthcare Bot service is designed to streamline more straightforward customer service questions while only the complex issues reach a human counterpart, which optimizes time and improves interactions with patients.

There are several other AI applications across industries not directly saving lives, but still improving our safety. Striving to save lives in a different sense (94 percent of crashes are due to human error according to the National Highway Traffic Safety Administration (NHTSA), ANSYS is using simulation to train autonomous vehicles through virtual driving scenarios, which improves its self-driving AI algorithms without jeopardizing human safety. Rockwell Automation's Project Sherlock is creating a safer environment and enabling operational efficiencies through an AI module reducing false-positive alarms for boiler, pumps and chillers in industrial settings.

If AI is the brain, then data is the lifeblood

Accessibility to data is a key element in any AI deployment. The DeepGestalt computer vision system was trained with 26,000 patient cases and the UC San Diego case leveraged more than 1.3 million patient visits with more than 100 million data points from a large health center in Guangzhou, China. Deploying a fine-tuned inferenced AI model in the real-world requires a vast amount of training data. In the case of the autonomous vehicle, it is estimated to take 8 billion miles of failure-free test driving for it to equal human performance.

Through increasingly connected endpoints, Industrial Internet of Things (IIoT) platforms are tapping into and contextualizing data from organizations' high-value and disparate assets. This can then feed into AI models and produce back AI-driven analytics to be applied at the edge or in the cloud. 3D CAD models can feed annotated product data sets to train object and image recognition applications for an AR experience used by a service technician. AI at the product conception stage comes through generative design simulation software analyzing data relationships with different constraints, materials, physics, manufacturing processes and design objectives.

Final thoughts

The use cases generated by AI continue to grow immensely in variation and scale as these data inputs increase. IDC forecasts spending on AI systems will reach nearly $78 billion in 2022, up significantly from 2018 when it was $24 billion. The 'better together' story between humans and machines will continue to prosper; 67 percent of executives surveyed by PWC claim using both artificial and human intelligence creates a stronger value proposition. The overarching AI theme will mitigate away from job replacement themes as it solves customer, industry and societal problems facing us today.

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SMART FIXTURES, SMART MANUFACTURING

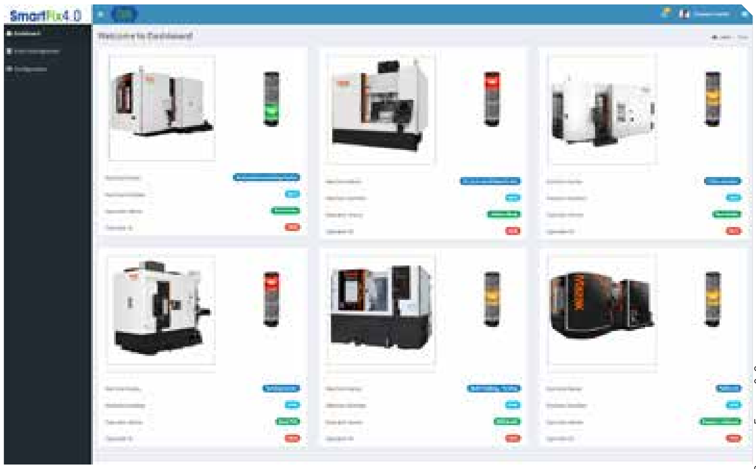
The recently concluded IMTEX 2019 bore testimony to the fact that technology has a profound impact on how factories operate today. For the first time in the 50 years of IMTEX exhibitions, a separate hall was dedicated to Industry 4.0 and IoT related technology. This is a harbinger of a smart future with more and more Indian companies gearing up to reap the benefits of making their factories smarter through the use of Industry 4.0 solutions.

Source: Forms & Gears

Source: Team MMI

The term Industry 4.0 refers to the Fourth Industrial Revolution. The earlier three industrial revolutions were characterized by rapid advances in technology that enabled humans to be less dependent on animal power, made mass production possible and brought digital capabilities to billions of people around the world.

Industry 4.0 is marked by breakthroughs and technological advances in a number of fields including Robotics, Artificial Intelligence, Nanotechnology, Biotechnology, the Internet of Things (IoT), Big Data Analytics, 3D Printing, Autonomous Vehicles etc.



Dashboard View – Representation of a machines on floor along with status indicators derived from sensor data

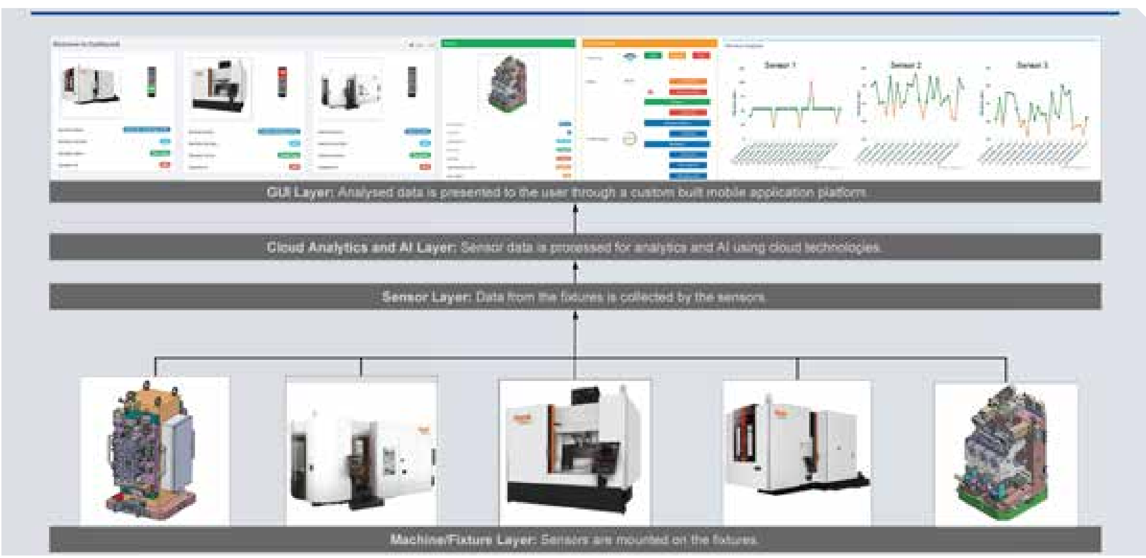
Evolution of Smart Fixtures

Of the numerous Industry 4.0- and IoT-enabled products displayed by the machine tool and cutting tool companies at IMTEX 2019, a few stood out to be the most innovative. Jointly developed by Forms and Gears, one of India's oldest and reputed fixture building companies and ASM Technologies, a Bangalore-based public limited company specializing in Product Engineering, Data Analytics and Artificial Intelligence, SmartFix 4.0 was one such product that garnered favorable attention.

Speaking on the company's new offering, Reji Varghese, Managing Director, Forms and Gears, reveals, "Over the last 47 years, we have seen seismic shifts in manufacturing. We used to do workholding for conventional machines in the 70s which slowly transformed to fixtures for indigenous machining centers to advanced workholding solutions for high-speed imported machining centers. To keep up with the advancements in the machine tool and cutting tool technology, workholding technology has also to keep pace so that the capability of the machines and the tools can be fully utilized."

He adds further, "Over the last few years we have come to the conclusion that the next revolution in workholding would be to make fixtures smarter by making them IoT- and Industry 4.0-enabled. As the technology required for making such kind of fixtures was not available in-house, we decided to look for a partner who had the know-how in electronics and IT-relat-

SmartFix 4.0 is a Precision Workholding Device with the ability to collect, transmit and analyze data in a useful format for the end-user.



Smartfix process flow


Source: Forms & Gears

"To keep up with the advancements in the machine tool and cutting tool technology, workholding technology has also to keep pace so that the capability of the machines and the tools can be fully utilized."

Reji Varghese
Managing Director
Forms and Gears


Source: Yamazaki Mazak India Pvt Ltd

"There was a lot of interest in the SmartFix 4.0-enabled Tractor Cylinder Block Fixture that we displayed at IMTEX 2019. It was a regular Cylinder Block fixture but installed with the SmartFix 4.0 kit consisting of electronics and sensors which were continuously collecting and transmitting data wirelessly which was analyzed and sent back in a useful format."

Anil Bharadwaj
Managing Director
Yamazaki Mazak India Pvt Ltd


Source: ASM Technologies

"Our aim is to make Smart manufacturing affordable to even small companies in India. We plan to amortize this over a large installed base to make this an affordable solution."

Rabindra Srikantan
Managing Director
ASM Technologies

R&D in the fields of sensors, data processing and analytics, and decision-making procedures are likely to take a big leap to reduce the costs to eventually benefit many sectors including MSMEs.

ed expertise in Data Analytics, Artificial Intelligence, Machine Learning etc., and that's how our joint venture with ASM Technologies happened."

Anil Bharadwaj, Managing Director, Yamazaki Mazak India Pvt Ltd, says, "There was a lot of interest in the SmartFix 4.0-enabled Tractor Cylinder Block fixture that we displayed at IMTEX 2019. It was a regular Cylinder Block fixture but installed with the SmartFix 4.0 kit consisting of electronics and sensors which were continuously collecting and transmitting data wirelessly which was analyzed and sent back in a useful format. We hope to offer this to turnkey customers by mid-2019."

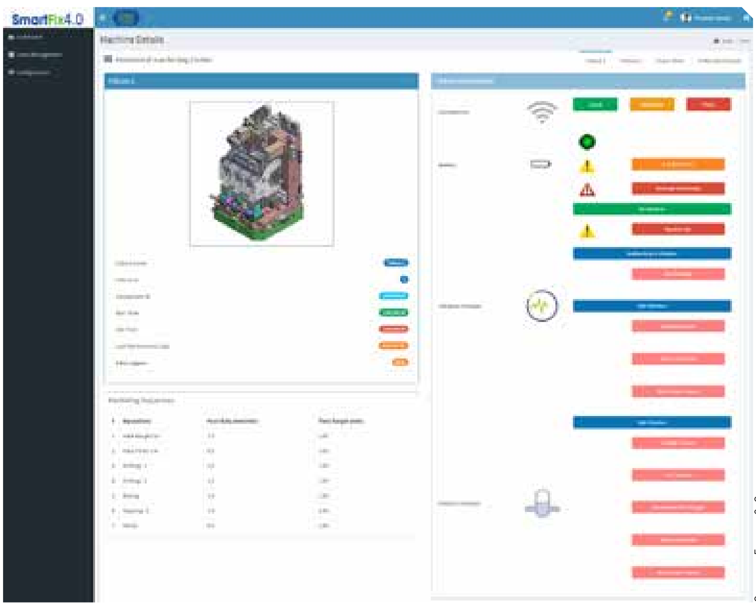
SmartFix 4.0

SmartFix 4.0 is a Precision Workholding Device with the ability to collect, transmit and analyze data in a useful format for the end-user. Developed for the first time in the world, it takes workholding devices and fixtures into the digital and cyber space.

As the fixture is in continuous contact with the component, it is the ideal device to collect and analyze data at the component level. Sensors to monitor vibration, pressure, and component sensing are mounted on the fixture. And sensors to monitor oil levels and temperature are mounted on the powerpack.

The high volume of data collected from these sensors are continuously transmitted wirelessly to the cloud where it is parsed and stored for analysis.

The raw data is then analyzed using Data Analytics and Artificial Intelligence tools and sent back to a custom-built Dashboard of the end user, which resembles their factory floor, showing all the machines in action as well as a quick summary on the health of each machine, fixture and powerpack.


Source: Forms & Gears

Machine Level View – Quick view of machine details and access to fixture level status

Source: Forms & Gears

"Highly accurate and intelligent sensors including accelerometers mounted at predesigned locations in a workholding fixture are highly helpful in getting useful data. Added to this, the data from the machine such as speeds, feeds, temperature and hydraulics etc. can be analyzed to obtain signature parameters for good output and quality."

M Lakshminarayan
Former Managing Director
Bosch

Source: Forms & Gears

"Implementation of IoT in the manufacturing industry is inevitable. But its benefits will only be seen when the Indian manufacturing industries convert the legacy machines into smart machines."

Prof N Ramesh Babu
Head, Department of
Mechanical Engineering
IIT Madras

Highly user-friendly

The user can click on each machine to get a more detailed understanding of the analyzed data per fixture. Data per sensor is visualized graphically with the ability to go back and see historical performance of the machine, the fixture and the powerpack.

For example, an analysis of data collected from vibration could reveal a wide variety of information like casting tolerances, vibration level comparison between tools, idle time of the machine, number of cycles run, number of components produced and vibration comparison across machines in the plant. This real-time data, sent on a mobile platform or to the computer of the concerned people, could result in productivity increases, optimizing tool life, and increasing safety.

If the vibration crosses a set upper threshold limit, the system can be designed to shut the machine off remotely through the emergency switch of the machine.

Sensors to monitor pressure would alert the operator via their phone or on any smart device and this can again be linked to the machine's emergency switch if required to ensure that in case of a sudden pressure drop the machine is switched off. Immediate alerts for any change in the sequencing of primary clamps, work supports and secondary clamps during the loading and unloading cycles would also help in giving immediate feedback to the machine to ensure that quality related issues due to wrong sequencing are eliminated.

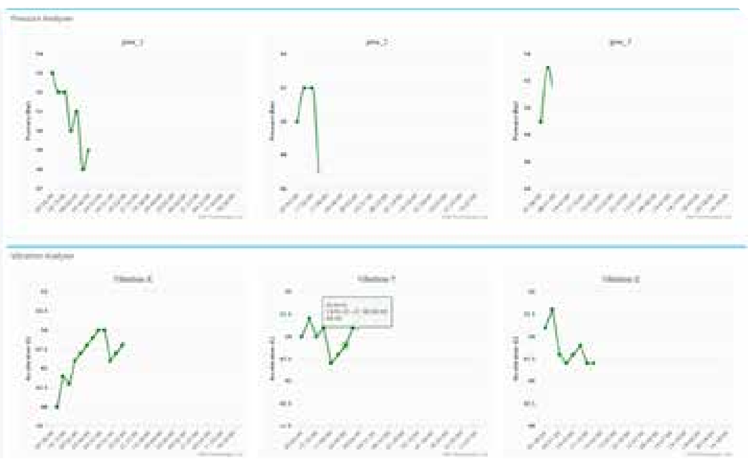
By monitoring the clamp/declamp cycles, alerts for maintenance of fixtures, ordering of spares and seal kits would also be automatically generated by the system and alerts sent via smartphone to the concerned people. An analysis of vibration would also give an accurate feedback to the management on how many cycles the machine has run, what the idle time per machine is, the reasons for machine downtime and the number of components produced. Machine maintenance schedules could also be linked to this information.

With Artificial Intelligence and Machine Learning, SmartFix 4.0 can also help the user be more proactive on machine, fixture and tool performance as well as how machines are performing compared to each other.

Historical data can be analyzed, and a comparison of various parameters can be made across all machines in the plant giving the management useful information to reduce costs, increase efficiencies and improve quality.

M Lakshminarayan, Former Ex-Managing Director, Bosch, who has studied the fixture closely, comments, "I am happy to note that the capturing of data from the fixtures has been worked

This real-time data, sent on a mobile platform or to the computer of the concerned people, could result in productivity increases, optimizing tool life, and increasing safety.



Source: Forms & Gears

Pressure and Vibration Analysis


Source: Forms & Gears

SmartFix fixture

SmartFix 4.0 can be installed even on existing fixtures running in the plant, making it a flexible and cost-effective solution to get the whole machining facility Industry 4.0- and IoT-enabled.

upon. Highly accurate and intelligent sensors including accelerometers mounted at predesigned locations in a workholding fixture are highly helpful in getting useful data. Added to this, the data from the machine such as speeds, feeds, temperature and hydraulics etc. can be analyzed to obtain signature parameters for good output and quality."

Making smart manufacturing affordable

On the cost implications of enabling Industry 4.0 solutions to Indian companies Prof N Ramesh Babu, Head, Department of Mechanical Engineering, IIT Madras, says, "Research and Development (R&D) in the fields of sensors, data processing and analytics, and decision-making procedures are likely to take a big leap to reduce the costs to eventually benefit many sectors including MSMEs. IIT Madras is engaged in R&D of all these fields and is poised to bring in a change through many other efforts such as incubation and startups."

Rabindra Srikantan, Managing Director, ASM Technologies, notes, "Our aim is to make Smart manufacturing affordable to even small companies in India. We have a sizeable team developing the IIoT, electronics, software and analytics and have made significant investments for this development. We plan to amortize this over a large installed base to make this an affordable solution"

Converting old machines to smart ones

SmartFix 4.0 can be installed even on existing fixtures running in the plant, making it a flexible and cost-effective solution to get the whole machining facility Industry 4.0- and IoT-enabled.

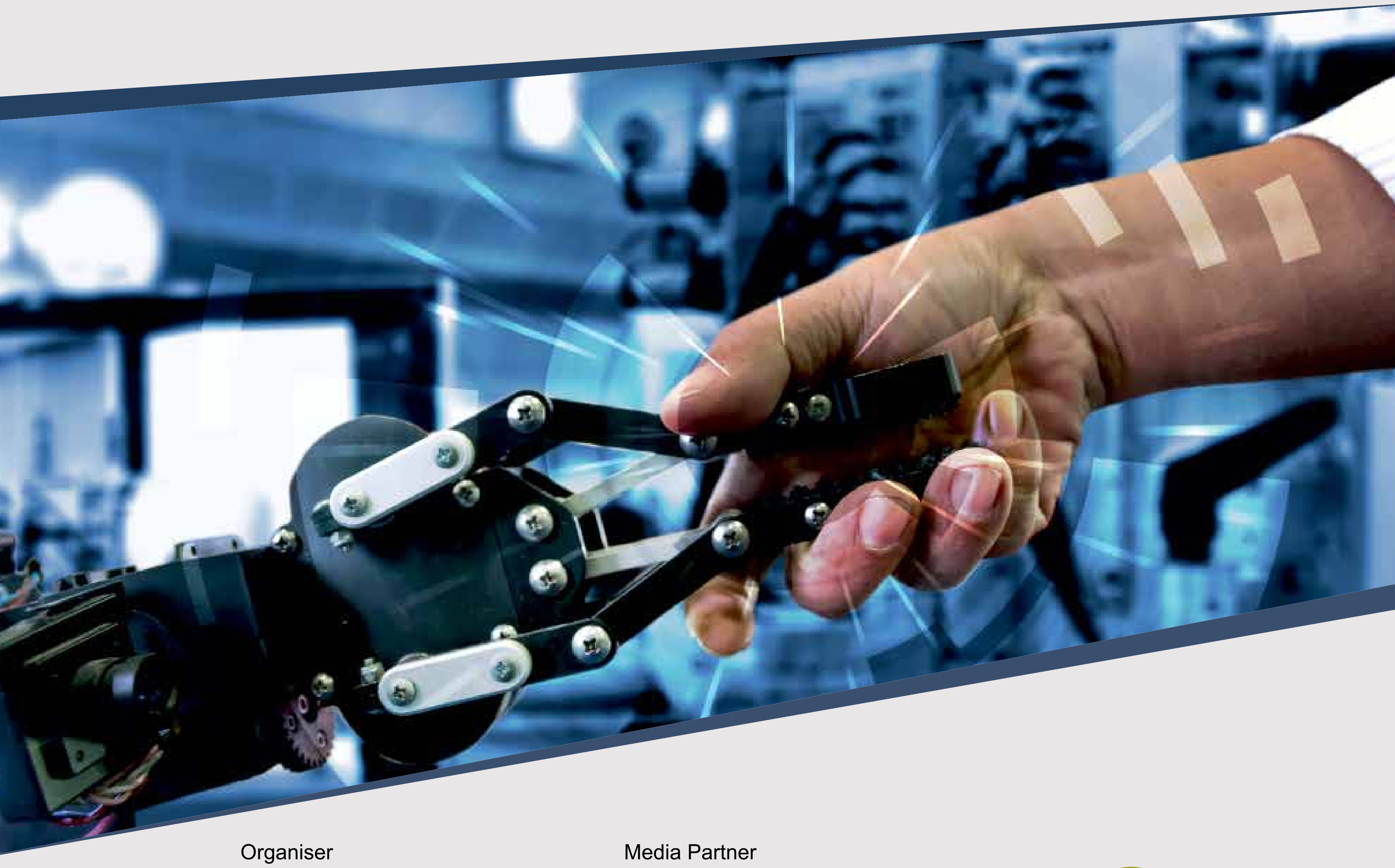
Babu comments on the implementation of IoT in India, "Implementation of IoT in the manufacturing industry is inevitable. But its benefits will only be seen when the Indian manufacturing industries convert the legacy machines into smart machines. This conversion can happen if we treat the physical processes in the shop floor as human beings. Then much of the information management practices of medical professionals may be applicable to the manufacturing sector as well. This humane treatment of machines and manufacturing processes may be the next generation Smart Manufacturing."

Srikantan, adds, "With SmartFix 4.0, even older machines can be Industry 4.0- and IoT-enabled by mounting the SmartFix 4.0 kit on the existing fixtures running on these machines. This is a simple and cost-effective way to convert legacy machines into smart machines. We feel the device is a game changer in the fixture building, machine tool and manufacturing business."

Worldwide potential

Professional race car driver Akhil Rabindra, who races in the GT Circuit in the UK and Europe and is also part of Forms and Gears and ASM Technologies, states, "Cutting-edge technology is the key to performance in racing as precision is key. We analyze large amounts of data from the car and our driving to go even faster. Data is extremely important for the man and the machine to win races."

"Some of the car manufacturers that I have raced for including McLaren, BMW, and Toyota spend significantly on R&D and invest in the most advanced machine tool technology. We see SmartFix 4.0 as a cutting-edge technology that can bring a lot of value to companies around the world. We are looking to bring SmartFix 4.0 into the UK, Europe and the US this year," he shared summing up.



ALL THE RIGHT MOVES

In a conversation with Team MMI, Kamal Bali, Managing Director, Volvo India Pvt Ltd, points out to the need of the hour – digitalization, environment sustainability, collaborations, filling the skill gap – for the Indian manufacturing industry to up its game and join top league global powers.

Source: Volvo India Pvt Ltd

Kamal Bali
Managing Director
Volvo India Pvt Ltd

Source: Team MMI

How important do you think is embracing advanced technologies such as Industry 4.0 for India to become a manufacturing powerhouse and come at par with its global peers?

Kamal Bali: The nation has taken various initiatives to pave the way for digitization and digitalization. Industry 4.0 was a natural progression in the digital space for manufacturing. This, over time, will lead to an astonishing rise in the availability of data for analytics, connectivity, a new form of human-machine interaction and advanced robotics. This has the capacity to match products and solutions to customer needs like never before, and at significantly lower cost and resource consumption – thanks to 3D printing, IoT, AI, robotics and overall digitization, connectivity and automation.

As per a study by McKinsey, the Digital India plan could boost GDP up to $1 trillion by 2025. It can play a pivotal role in macroeconomic factors such as GDP growth, employment generation, labor productivity, growth in a number of businesses and revenue leakages for the Government.

Volvo Group in India has initiated several steps towards Industry 4.0 and the first step is to get Manufacturing Intelligence Integration (MII) in place.

The shift towards collaboration in manufacturing is a major development for the sector. What are the benefits expected out of collaborations between big players with SMEs, first-time entrepreneurs, innovators etc.?

Bali: The increased accessibility to knowledge and information, the ability to harness information to optimize systems as well as ecosystems and the advent of technologies such as 3D printing etc., means that innovations are bound to emerge beyond just large organizations. Hence, complementing the enthusiasm and flexibility of first-time entrepreneurs with established organizations is surely a very good idea. Also, the more we collaborate and share, the greater the opportunities to develop new insights and alternate solutions.

Organizations are under the pressure to increase productivity, either by increasing the outputs (throughput) or decreasing the inputs (costs). To weigh them down, even more, is the push for growth by capturing new customers in order to remain competitive. This is amplified by the fact that new technologies are short-lived as the pace of technology innovation is meteoric.

Collaboration is bound to reduce waste and improve quality by allowing everyone involved in the value stream of the product development lifecycle to have the precise information and metrics - without wasting time hunting for, translating, collating, and duplicating information across siloed sections.

How does India address the gaping skill gap which is one of its main issues?

Bali: The advent of Industry 4.0 is more of an opportunity for us to reskill and upgrade. If automation will kill one job, it will create more jobs for well-skilled personnel. For this, all stakeholders - the government, companies, educational institutions, and workers - have a role to play. The government will have to create policies that fund and strengthen the quality of education for preparing the nation for new skills. Companies will have to compensate for old skills by training the talent.

Decidedly, greater use of robotics and computing will reduce the number of jobs in assembly and production, while the number of manufacturing jobs requiring skills in IT and data science will increase. The three enablers that will define the factory of the future are: strategy and leadership, employee skills, and IT infrastructure.

Source: Volvo India Pvt Ltd

"Manufacturers need to come to terms with the brewing technologies and their role in shaping the future of the industry. These technologies will help the industry achieve greater reliability and lower cost that will bolster the bottom line."

Kamal Bali
Managing Director
Volvo India Pvt Ltd

Are Indian manufacturing companies embracing sustainable manufacturing as much as they should?

Bali: The industry is becoming increasingly wary of resource scarcity, global warming, congestion, and pollution. It is continuously moving towards embracing sustainable manufacturing to lower the carbon footprint by reducing fuel consumption, waste management, providing greener workplaces and leading to a greener eco-system.

Back in 2007, Volvo Group displayed seven different fuels on seven different vehicles of ours. Fuel Efficiency of our engines globally has improved by 40 percent over the last two decades and we have a commitment to improve fuel efficiency by 1 percent each year in our trucks. We have displayed driverless trucks in mining; platooning in highway trucks supporting the movement towards more eco-efficient and safer mobility.

Volvo Group has a quantified commitment for the long-term as part of its WWF climate saver partnership program. We aim to improve energy efficiency in production by executing energy-saving activities, reaching a level of 150 GWh by 2020. When it comes to products, we aim to reduce total lifetime CO_2 emissions from products sold between 2015 and 2020 by a cumulative saving of at least 40 Mton, compared to 2013 models. We have an additional area of transport logistics where we aim to reduce CO_2 emissions per produced unit from the Volvo Group freight transport by 20 percent by 2020.

All three factories (Volvo trucks, Volvo buses and Volvo CE) are now powered by renewable energy (solar) replacing 70-80 percent of the existing power supply.

In what way should Indian machine tool companies step up their game to meet global auto and component makers' requirements?

Bali: Manufacturers need to come to terms with the brewing technologies and their role in shaping the future of the industry. These technologies will help the industry achieve greater reliability and lower cost that will bolster the bottom line.

India's auto sector is extremely cost/price sensitive. While technology is available to make high-quality components with quick capacity ramp ups, it has also been found challenging the economics.

India needs more low-cost automation solutions and special purpose machine tools that can actually embrace 'Make in India' concept rather than importing expensive high-end machine tools.

There are various companies that are engaged in the design of low-cost machine tools which can deliver the same high-quality stuff and still be economical.

India needs more low-cost automation solution and special purpose machine tools that can actually embrace 'Make in India' concept rather than importing expensive high-end machine tools.

WITH THE PIONEER SPIRIT

With relentless focus on productivity and quality, Gedee Weiler Pvt Ltd has invariably met the dynamic demands of its customers, winning them over and over. Besides being the pioneer in manufacturing CNC lathes in the country, the company has been steadfastly challenging the status quo to emerge on top in the machine tools space.


Source: Gedee Weiler Pvt Ltd

Gedee Weiler Tech Center at the Coimbatore plant

POONAM PEDNEKAR
Chief Copy Editor
Magic Wand Media Inc
poonam.pednekar@
magicwandmedia.in

A leader in machine tools for small components and precision applications, Gedee Weiler Pvt Ltd has come a long way from when it commenced its journey as a joint venture company between the leading industrialist from South India, GD Gopal, and the technical and financial partner, Weiler Werkzeugmaschinen from Germany for the manufacture of sophisticated high-precision lathes in India.

The company today operates out of a sprawling facility spanning 20 acre with a present turnover of ₹56 crore and a target of ₹65 crore for the next fiscal.

Its major Indian and international customers include Lucas TVS Ltd; Durovalves India Pvt Ltd; Patton International Ltd; Tata Advanced Systems Ltd; Indian Space Research Organization (ISRO); LG Balakrishnan & Bros Ltd; GDW Werkzeugmaschinen GmbH, Germany; Dr.-Ing. Robert Stopp Werkzeugmaschinen GmbH, Germany; PT. Buana Prima Raya, Indonesia; RYU Technology Co., Ltd, Thailand; Quality Machine Tools PTY Ltd, Australia; and Al Nasr Engineering L.L.C, Dubai.

Scaling up

It's fascinating to learn about the opportunities the company could make for itself, recognizing and catering to the market needs of the time. "After having added automats and special purpose machines for watch case machining and hydraulic copying lathes in the years to follow, it was in 1986 that Gedee Weiler made the first CNC lathe and, thus, is one of the pioneers in the machine tool industry in India in the manufacturing of CNC machine tools," shares Ganapathi Subramanian, Vice President – Marketing & Sales, Gedee Weiler Pvt Ltd. The year 1994 saw another significant change. The company's collaboration ended with Weiler Werkzeugmaschinen and it signed another technical collaboration agreement with GDW Werkzeugmaschinen, Germany. "Since then, we have been exporting lathes to Europe to our partner, from where these lathes are sold to many customers in Europe, and also exporting machines to Germany."

During this period, Gedee Weiler also changed its sales and marketing approach and gradually established its own direct and dealer network throughout India. A major expansion has taken place since in sales, service and dealer network throughout India in addition to setting up a tech center in Faridabad in the year 2017 and a corporate tech center at Coimbatore headquarters in 2018.

State-of-the-art plants and facilities

"Mother machines like duplex bed type milling machines, 5-axis machining centers, double column 5 face machining centers, double column slide way grinding machines and cylindrical grinders of world renowned brands form the backbone of our infrastructure," reveals Subramanian.

Hermle 5-axis machining centers, Studer and Schaudt CNC grinders, Schneider double column grinding machine, and Reishauer thread grinding machines are some of the brands of the mother machines the company has deployed.

Source: Gedee Weiler Pvt Ltd

"Investment in new technologies for capability enhancement as well as capacity expansion is an ongoing process and we have been upgrading our facilities continuously. We have doubled our sales turnover in the last three years and are confident to double the current in the next three years."

Ganapathi Subramanian
Vice President – Marketing & Sales
Gedee Weiler Pvt Ltd

"We have in-house fabrication facilities equipped with Siegmund welding tables which ensure the bases of the machines are welded precisely without any distortion. Apart from this, we have an in-house painting facility and state-of-the-art quality control set-up including coordinate measuring machines (CMMs), height masters etc.," he adds.

"Lastly, a team of dedicated, qualified engineers and a highly skilled work resource in design, engineering, manufacturing and assembly ensures quality in our products at various stages," he further adds.

Source: Gedee Weiler Pvt Ltd

Machines displayed at the Tech Center

Prime takers

"We are focused on offering turning solutions for a range of components up to dia 200 mm and for a length of about 500 mm in different materials like Steel, Cast iron, Aluminum, Teflon, etc.," informs Subramanian.

He adds that the machines find wide applications in the machining of small parts for auto components like Engine valves, Piston rings, Crank shafts, Gear blanks, Drive shafts, Gear shift levers, Auto electrical parts like Armature shafts, Wiper motor covers, Yokes, Steering rods, Kick starters, etc.

"While typically around 50 percent of the machines are supplied to the auto component industries, other major segments are in general engineering like pumps, valves and bearings. As we offer customized and tooled up solutions, we have a good number of machines working in the jewelry industry, special applications in the white goods industry, high-precision tool rooms in the aerospace industry, hard turning applications in the auto component sector, and also surgical screws," he shares.

The company's CNC and conventional machines find wide acceptance in the education sector too wherein it regularly supplies machines to leading institutions like IITs, Cipet, etc. Another noteworthy point is that Gedee Weiler is the largest exporter of machine tools to Germany from India. "We have supplied around 1500 machines in around five years including high-precision conventional lathes, CNC lathes in SKD conditions and also a number of CNC machines," adds Subramanian.

Apart from Germany, the company has a good presence in Indonesia where it commenced its business about two years ago and has already supplied nearly 100 machines including CNC lathes and turnmill centers.

As the Gedee family itself is well-known for its innovative traits, the organization is focused on the development of new products and solutions, and innovative ideas from different levels within the organization are nurtured and encouraged.


Source: Gedee Weiler Pvt Ltd

Conventional Lathe Assembly

"We see a lot of potential in markets like Thailand, Malaysia and Vietnam in the coming years, where we have already started focusing our attention," he shares.

Apart from Germany, the company has a good presence in Indonesia where it commenced its business about two years ago and has already supplied nearly 100 machines including CNC lathes and turnmill centers.

Focus on innovation

Gedee Weiler's philosophy has been to offer innovative solutions to customers that enable them to meet the quality and productivity demands of the market at a competitive price, thus maximizing their profits.

"That GD Rajkumar, Director, Gedee Weiler Pvt Ltd has in his name a patent in Germany for the innovative bed design of a CNC lathe, essentially meant for precision tool room applications which is primarily exported to Germany, stands testimony to our passion for innovation," says Subramanian.

The company focuses not only on developing innovative machine tools, but also makes continuous efforts in identifying the latest technologies that are available in workholding as well as tooling from across the globe which enhances the productivity, precision and flexibility of our machines.

"We have technology partners in Germany and there is a constant interaction between our Engineering / R&D, Application and Production personnel that helps us update our talents and give exposure to the global technology trends," he adds.


Source: Gedee Weiler Pvt Ltd

Versaturn XL

Shaping talent

With the aim to provide technical competence to the young talent and impart them with the skills required by the industry, the company in the year 2002, started its own Gedee Technical Training Institute (GTTI). A unit of GD Naidu Charities, the institute is located in a self-contained campus in the heart of Coimbatore with all the facilities and infrastructure to suit international standards.

"With the state-of-the-art machinery, equipment, design software and industry exposure, we endeavor to develop trainees with the skills to compete in a global arena," states Subramanian.

GTTI has formulated a structured syllabus based on German and Swiss standards of training and also similar to the German dual system of learning.


Source: Gedee Weiler Pvt Ltd

Uniturn 400 HD TM

Latest offerings

The company keeps adding innovative products to its already exhaustive range. The newest ones were launched at the recently held IMTEX 2019. They include: the Versaturn, a slant bed long stroke machine is the first of its kind product in India.

In the Universal line, the new Uniturn-400 HD TM is equipped with 12-station dual pitch live tool turret which caters to medium range of components of dia 150 up to a length of 250 mm.

"FlexturnNeo Twin, with a servo gantry loader, is another which is provided with two chutes at two ends and takes the fastest floor to floor time. This unique concept of the machine with two opposing spindles enables masking of the loading, unloading time with the machining time and thus ensures highest productivity, making it ideally suited for mass production of automobile components," notes Subramanian.

Future plans

"Investment in new technologies for capability enhancement as well as capacity expansion is an ongoing process and we have been upgrading our facilities continuously," he stresses.

The company has doubled its sales turnover in the last three years which was possible with the addition of CNC 5-axis machining centers, high-precision CNC grinders, single spindle twin turn vertical turnmill machines made in-house and certain other balancing equipment during this period. "We are confident to double our current turnover in the next three years," notes Subramanian.

Gedee Weiler has been receiving excellent response for the newly launched products and, therefore, plans to focus on such automated and customized solutions in the coming years.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“The best coolant I’ve ever used.”

Titan Gilroy
TITANS of CNC: Academy, USA

POWERED BY Modern Machine Shop

BOOSTING EFFICIENCY

Automation, when done right, provides numerous benefits to job shops. A look at the factors to consider before and after its adoption...

Robots keep machines running unattended from one job/part to the next.

Source: Modern Machine Shop

CHRIS FELIX
Editor-in-Chief
Production Machining
cfelix@productionmachining.com

The right type of automation delivers substantial benefits for job shops. The capability to increase spindle utilization and boost output of both people and machines is the most obvious, but improved part accuracy and consistency, reductions in human error and the potential for lights out production—all of which positively affect a shop's bottom line—should not be overlooked.

Because job shops frequently produce parts in smaller and more varied job lot sizes than do larger manufacturers, these often-smaller shops face different challenges, the main one being higher amounts of job change-overs. With this factor in mind, automation best suited for job shop needs will not only emphasize fast and easy setups and reduce job change-over times to 15 minutes or less, but also be adaptable for use from one type of machine to the next.

Ideally, shops should plan for automation at the time of machine tool acquisitions. Machines equipped and configured for automation early on can save time and the cost of retrofitting after the fact. Such automation preparedness can include automatic doors, built-in robot interfaces and any other necessary options such as larger tooling capacities and special workholding systems. Or, if future automation needs are uncertain, shops can opt for machines that make adding automation as easy and inexpensive as possible.

Things to account

Once a shop has made the decision to automate its processes, it must evaluate workpiece weight and variation as well as job batch/lot sizes to determine ideal jobs to automate. For instance, jobs that involve small batch sizes of very different part numbers are inefficient and costly in terms of automation. Conversely, high-volume-per-year jobs produced in low-to-medium-volume reoccurring batches at scheduled intervals are ideal candidates for automation, especially when there is little variation in terms of part size, processes and features. Such jobs require fewer job change-overs and have workflows that permit automated cells to run and produce as long as possible between necessary job change-overs.

On the other hand, automating for large workpieces requires careful consideration as to how those parts will be presented when loaded and unloaded from a machine tool. Shops must also determine what type of end-of-arm tooling on articulated or gantry robots will be most efficient for the larger parts. Simple fixturing can eliminate having to manoeuvre big parts into complex setups. In these types of production scenarios, shops should avoid multiple sequencing where parts are clamped and unclamped numerous times during processing.

Maximizing automation utilization and helping to justify its cost requires careful consideration of how machining cycle times effect up and downstream processes. For instance, when machining large parts with longer machining times, shops can integrate a robot to perform other tasks within peripheral processes while parts are being machined. This configuration may require the robot to ride on rails or travel overhead to serve those other processes and pieces of equipment, or to be positioned to tend several of the same types of machine tools running similar parts.

Ideally, shops should plan for automation at the time of machine tool acquisitions. Machines equipped and configured for automation early on can save time and the cost of retrofitting after the fact.

Pre-Engineered and Customized Automation

Job shops have many automation options to achieve their goals. Solutions range from pre-engineered to customized systems, both of which are scalable in size, cost and capability. Pre-engineered solutions cover a broad range of process requirements and can enable a job shop to quickly increase productivity and improve the bottom line. Shops with more sophisticated needs, such as automating multiple machines, part transfers to peripheral operations, or the handling of large, heavy or cumbersome parts, can benefit from customized solutions such as articulated robots.

- **Built-in, two-pallet changers** provide simple, self-contained automation that allows parts to be loaded and unloaded without having to interrupt machining operations.
- **Bar feeders** are one of the simplest, most cost-effective forms of automation available and are used to automate the loading and feeding of bar material into a CNC lathe with built-up area required.
- **Gantry loaders** provide fast, high-production loading and unloading during chuck and shaft work. The systems are easy to install and operate, and provide a quick, turnkey solution that helps shops immediately increase productivity.
- **Mazak's Multi-Pallet Pool (MPP)** system is a compact multiple pallet stocker system ideal for manufacturers who require basic automation to increase productivity and/or have limited floor space that prevents installation of a system with a horizontal pallet stocker. It's an expandable system that allows shops to initially incorporate the stocker with a few pallets and grow the system as production needs change.
- **Palletech** from Mazak is a modular system available in single-, double- and triple-level pallet stocker configurations. It is compatible with a range of horizontal machining centers, multitasking machines and Orbitec 20 machining centers and is well-suited for high-mix, low-volume production as well as high-volume operations common in job shops.
- **Smooth PMC** is schedule operation software for Mazak flexible manufacturing systems (FMS) that predicts necessary tools and production output according to the production schedule. Information is displayed in a variety of graphs that enable easy utilization analysis.
- **Floor-mounted articulated robots (with stocker)** keep machines running unattended from one job/part to the next. The robots incorporate rotary joints—ranging from simple 2-joint robots to complex 10-joint robots—to complete tasks and gain a competitive advantage.

Eight key automation considerations

Workholding: If the workpiece requires positioning in the chuck or fixture or needs to be aligned in the secondary operation based on features created in the first operation, vision systems or touch probes may be required to complete the task.

Gaging: If an unautomated process requires the operator to measure the workpiece during or after machining, automating the gaging process should be considered. Several in-process or post-process options are available, including touch probes, periodic artifact calibration or even use of a post-pro-

Source: Modern Machine Shop

Palletech is a modular system available in single-, double- and triple-level pallet stocker configurations. It is well-suited for high-mix, low-volume production as well as high-volume operations common in job shops.

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cess gage or coordinate measuring machine.

Cycle times: Cycle times will determine the capacity/size of the queue tables and infeed/outfeed conveyors for finished workpieces. They will also be key in sequencing coordination of additional tasks required of the robot/automation, such as loading to gages, coordinating measuring machines, wash stations, or turn-over stations or simply managing/arranging incoming and outgoing materials on pallets.

Unattended process: Job shops must ensure machine reservoirs for grease/oil lubrication and coolants are of sufficient capacity to last the duration of the unattended cycle. Likewise, chip evacuations and capacity to contain chips must be large enough to eliminate the need for human intervention throughout the entire unattended cycle.

Tooling: Unattended automated processes necessitate excellent tool life management including predictive tool life and often redundant tooling. This is particularly true when machining hard materials such as high-temperature alloys or hardened steels.

End-of-arm tooling: End-of-arm tooling solutions can be designed using workpiece drawings, material dimensions and weights, sample castings or forgings.

Safety: A safety review should take place before, during and after the automation implementation project is compete and must comply with ANSI/RAI R15.06-2012 risk assessment. Securing a safe work area may require the addition of light curtains or fencing.

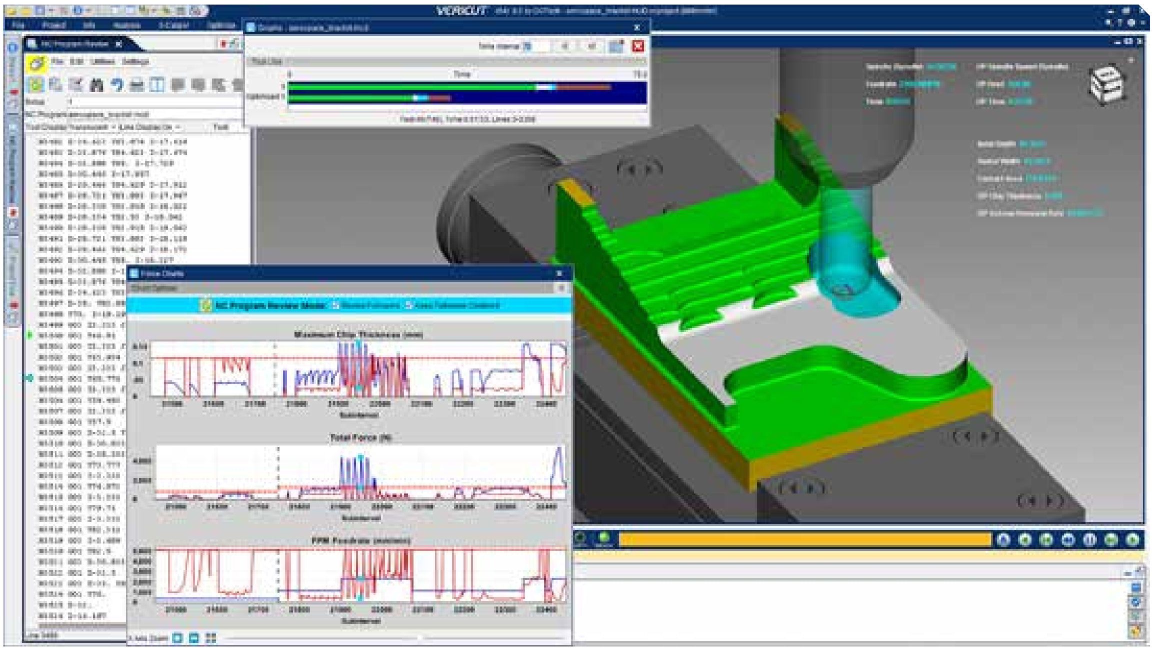
Monitoring: While automated operations may eliminate the need for a dedicated machine operator, they still require monitoring. Advanced connectivity, such as through MTConnect, provides the capability to remotely monitor the system as well as troubleshoot and diagnose problems.

Source: Modern Machine Shop

The Multi-Pallet Pool (MPP) is a compact multiple pallet stocker system ideal for manufacturers who require basic automation to increase productivity and/or have limited floor space that prevents installation of a system with a horizontal pallet stocker.

TACKLING THE TOUGH STUFF

The NC program optimization module from CGTech can safely be termed as a boon for those dealing with difficult-to-machine materials, rendering benefits such as reduced cycle time, improved tool life, better part quality, and less wear and tear on CNC machine tools.



Source: CGTech India Software Solutions Pvt Ltd

In VERICUT Force, blue line 'spikes' reveal excessive or unsafe cuts in the original program, while red lines show gains and corrections made by optimizing.

CGTech's Force, a physics-based NC program optimization module that works within the company's flagship VERICUT toolpath simulation software, has compelled the industry to stop and pay it the attention it deserves. It was first noticed at an event incorporated in an Okuma machine which was demonstrating machining of real parts from titanium, a very hard and difficult-to-machine material.

"We had the same demo on two vises and ran them side-by-side, one with the standard program and one that was optimized," said Lee Johnston, Applications Engineer, Okuma America Corporation.

"We reduced the cycle time from an hour to just under 40 minutes, and one could also hear and see the difference in how the tools were cutting and tell that the optimized program was easier on the machine. This is probably the best thing to happen to programming since trochoidal toolpaths," he added.

Working with representatives from CGTech and Sandvik Coromant, Johnston programmed a Ti-6Al-4V titanium bracket being made for an aerospace customer, then optimized its toolpaths with VERICUT Force.

A Force to reckon with

Pete Haas, VERICUT Product Specialist, CGTech, explained that Force works by analyzing the NC toolpath, evaluating the changing cutting conditions, and increasing or decreasing the feed rate to achieve the ideal chip thickness for any given material. Compared to CAM systems and online machining calculators, which attempt to determine average chip thickness and base the feed rate on that, Force calculates the optimal feed rate for every single line of machining code.

"As an example, think about driving to work each morning," Haas said. "You encounter straight sections, curves, and sharp turns, and have to slow down or speed up depending on the road conditions. Machining also involves constantly changing conditions, but some CAM systems don't account for this. They generate a single feed rate that may be too aggressive on tight turns and too slow on the straightaways. Force, on the other hand, uses physics

Source: CGTech India Software Solutions Pvt Ltd to calculate cut-by-cut throughout the changing conditions and determine the optimal feed rates." The result, according to Haas, is greatly reduced cycle time, improved tool life, better part quality, and less wear and tear on CNC machine tools. It works on any material and any machine, and can even be used on legacy programs.

Testimonies

For Chris Davala, Technical Support Engineer, CGTech – someone with 20 years of experience as a machinist and programmer who now works with VERICUT customers across the country – the demo was an eye opener.

Richard Howard, MTS specialist, Sandvik Coromant, backs it up. He supplied the cutting tools and toolholders used for the demo and specified the initial machining parameters.

"As a tooling specialist, I am extremely impressed with how 'spot on' the Force software is," he said. "CGTech has done an amazing job of optimizing programs while taking into consideration tooling geometries and resulting loads. Anyone interested in higher efficiency and prolonging tool life should look into this."

Constantly improving

Anyone familiar with Okuma machine technology might consider Force unnecessary. That's because the OSP control offers advanced features such as Machining Navi, SERVONAVI, Super-NURBS, and adaptive machining technology. How can a third-party software package make a top-notch machine tool perform even better? There are several answers:

Force has the ability to break up the NC code into smaller bites, adjusting feed rates to maximize chip thickness and keep it constant.

Its optimization capabilities are proactive, not reactive, so everyone knows what to expect before pushing the cycle start button.

Performance issues are clearly identified up front, and the programmer can examine the Force Charts that illustrate projected cutting forces, chip thickness, feed rates, tool deflection and more.

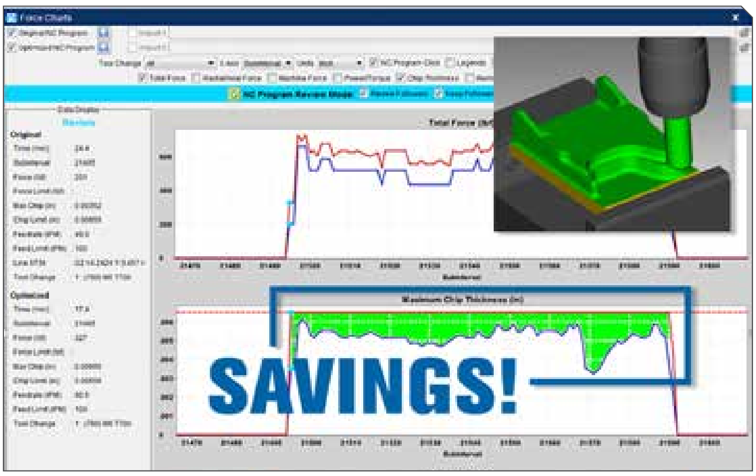
For new materials, new machine tools and cutters, or even new programmers, Force eliminates the guesswork that would otherwise occur.

The result is an NC program that's both safer and more predictable, with low risk of tool breakage or scrapped parts. Operators have more confidence. Lights-out machining is performed with confidence. Profit margins are improved. And Force-optimized toolpaths "save a great deal of time during roughing," said Howard.

Haas summed it up like this: "Force charts provide NC programmers with useful information they never had before. They can quickly and easily visualize what's happening cut-by-cut as the tool moves through the material, and it's now possible to visualize excessive forces, inefficient cutting parameters, metal removal rate, power consumption, torque, and tool deflection. Force charts also expose cutting condition improvement opportunities. With one click on the Force chart, the user is taken to the exact location in the program and to the graphical review window for further analysis. The end result is full utilization of the cutting tool and the machine tool."


Source: CGTech India Software Solutions Pvt Ltd

In the Okuma demonstration, the VERICUT Force-Optimized finished part was produced more than 20 percent faster than the original programmed part.



Source: CGTech India Software Solutions Pvt Ltd

Force works by analyzing the NC toolpath, evaluating the changing cutting conditions, and increasing or decreasing the feed rate to achieve the ideal chip thickness for any given material.

Auto Component Manufacturing Insight

The Indian auto-components industry has experienced healthy growth over the last few years and is expected to further grow to $200 billion by 2026. The industry has also witnessed a drastic evolution in important technological advancements. Therefore, remaining competitive could pose a greater challenge than many manufacturers realize.

As Taiwan is the fourth largest machine tools exporter in the world, its advanced manufacturing technology and rich international service experience are trusted by world renowned auto-components manufacturers. In this article, we have thus invited Taiwanese machine tool makers to share their insights regarding Indian auto-component manufacturing challenges and the solutions that will enable them to stay ahead of the game.

Time to upgrade to Intelligent manufacturing

It is inevitable for Indian auto component suppliers to upgrade to intelligent manufacturing when Auto OEMs nowadays require much higher level of manufacturing technology under the challenge of Industry 4.0.

SEYI provides "Intelligent Manufacturing Solution" with three applications: "Smart Machinery", "Smart Production" and "Smart Management." Under this platform, machines with connectivity, information visualization and system integration can be achieved, making the production process digitalized, smart and flexible. These benefits will help users to manage the quality effectively and enhance the productivity.

SEYI PRESSING AHEAD
Vice president
Mr. Steven Lee

Protect your workpiece from power failure

As world prestigious automobile factories invest in India, it is a great chance to create an automobile empire. However, power failure makes the machine fails to respond in time that might cause crash problem on work piece and tool. Product's lead time will also become longer under this circumstance. This will jeopardize manufacturer's business.

Kao Ming, as a leader of professional double column machining center. To cope with India power failure, our machines equipped with power failure backup system (PFB) to prevent this crash problem happens. Kao Ming is not only a supplier but also a strong support for India manufacturers.

KAO MING
General Manager
Mr. Tim Chang

Forging technology is the trend in automobile industries

Forging technology has been developed accompanied with automobile industries and be prosperous to meet high precision, high rigidity, high speedy, automation and intelligent motion.

To cope with the demand, Chin Fong machine release our WF series machine. It is specified for warm-hot forging working environment. Optimized design upgrades the forging capacity and offers better production quality. Also, it is designed on the concept of energy conservation and environmentally friendly as it is the best forging machine in the next decade.

Sales Director
Mr. Jason Lee

Turn-key solution partner for business expand

In recent years, several automobile manufacturers have shifted their plants to India, so the demand of automotive components has become greater and greater. Component manufacturers might have production cost, delivery time, manpower shortage or increase in wage challenges.

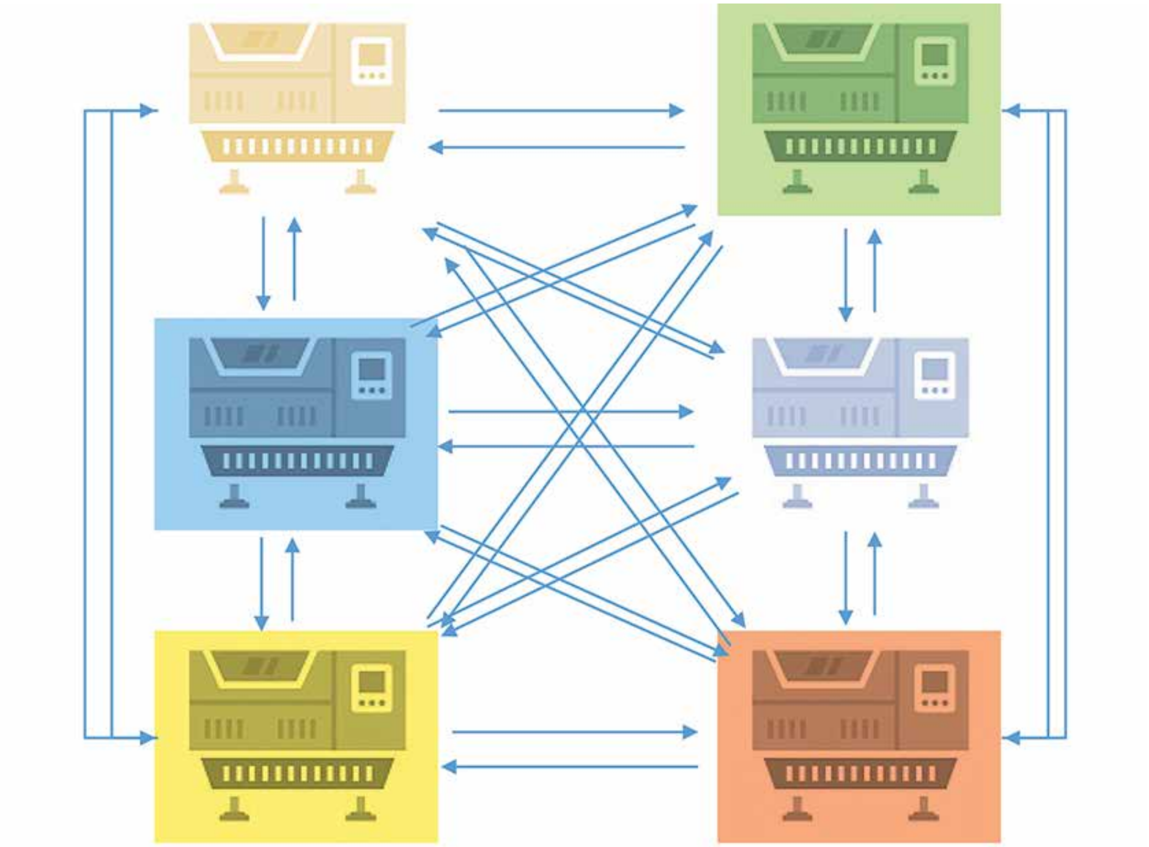
Manford can provide whole plant machinery design, planning, installation, production line optimization, technical support, employee training and so on to help business owners to overcome their difficulties. We also offer friction welding machines for manufacturers who producing electric vehicle batteries.

General Manager
Mr. Kris Hsieh

POWERED BY Modern Machine Shop

CLOSING THE LOOP

As the notion of self-aware machines is on the rise, so is the need for communication standards and protocols to fill connectivity gaps and develop technology.



Source: Modern Machine Shop

MTConnect is a model for understanding the value of a standard that enables dissimilar data sources to communicate in a network without the complexity of unique data translators or proprietary interfaces.

Artificial intelligence is an up-and-coming application enabled by the Industrial Internet of Things (IIoT). More specifically, the notion of self-aware machines or systems that can learn from their own environment and adapt on the fly is gaining wider acceptance as a feasible and desirable possibility. However, the seemingly mundane world of communication standards and protocols is playing a key part in this technology development, because it promises to fill gaps in the critical infrastructure that are still missing.

To begin, it's important to grasp the value of self-aware machines by looking at some real-world cases. Machine tools already have, in fact, some capability for self-awareness. They operate as a collection of systems, subsystems, components and sensors that are linked together and centrally controlled. For example, a feature such as backlash compensation takes advantage of input from one component to calculate an adjustment that is fed back to the control of the component to eliminate an unwanted result. Likewise, the technology to make a real-time feedback loop for cutting tools is also in development. Vibration sensors feed data to a toolholder that can automatically make slight adjustments to avoid undesirable harmonics, which, in turn, reduces chatter, improves surface finish and increases insert life.

Missing communication standards

In theory, these current applications of self-aware equipment could soon be joined by much larger feedback loops. A part or assembly on the factory floor

Source: Modern Machine Shop

could carry metadata about itself and the equipment, designs and people that created it. The manufacturing enterprise software and radio transmitter components required for these feedback loops exist today, but gaps in connectivity are preventing solutions from functioning as intended. Communication standards are missing or incomplete, thus making the one-to-one connections and translations between components excessively complex.

Upstream from production, manufacturing engineers and the software companies that serve them are trying to figure out how to reduce design changes and rework. Input from machine tools, inspection data and other sources will eventually be available at the design phase to guide decisions, just as cutting tool libraries have now become an integral part of CAM software.

Similarly, finished parts will carry information about their service life with them. This will benefit operations to rework, repair or maintain them. This practice is the norm for many aerospace parts now, with sophisticated part genealogies required for FAA compliance. Promoting this trend is the continued decline in the cost of data acquisition and storage. However, developing the standards for defining data and its framework is still a hurdle to overcome. These standards are needed to link and relate different types of data from disparate components.

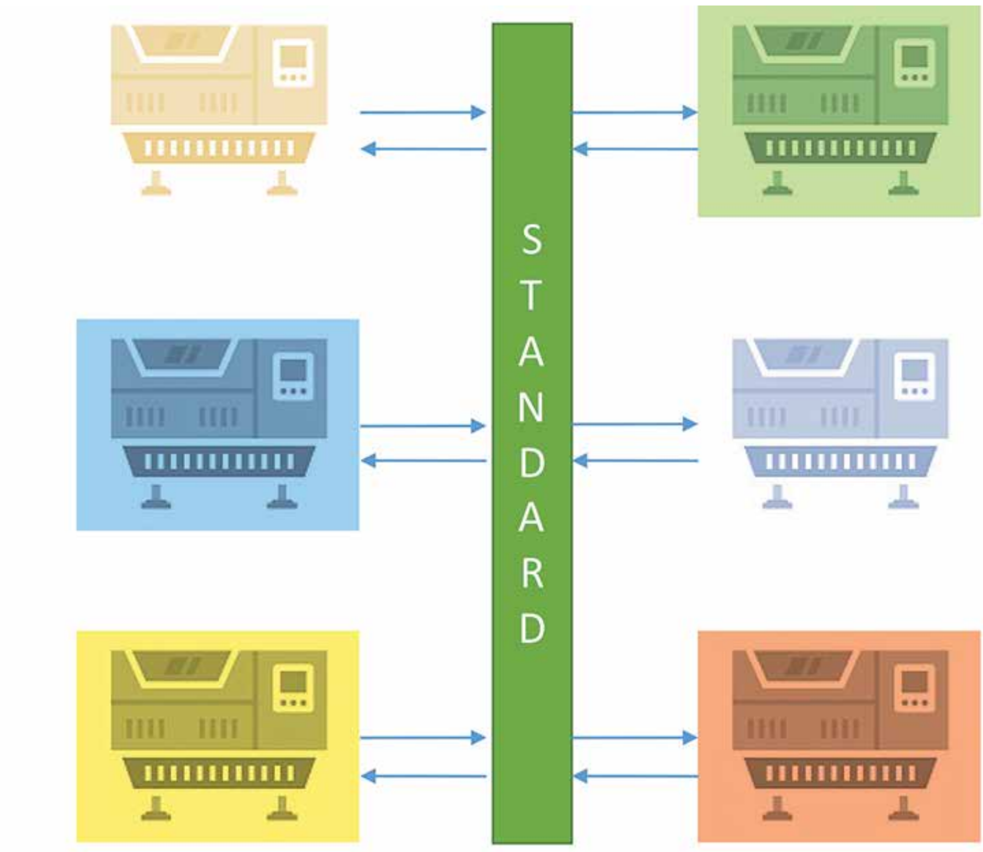
Standards are crucial

To assist in this transition, the MTConnect standard is changing in two major ways. First, it is expanding its sets of definitions to cover types of equipment not previously addressed. For example, the standard has been implemented for additive manufacturing and for lasers. In both cases, extensions to certain existing data items could be used for this purpose. These extended definitions are being brought into the official release of the standard through the Technical Advisory Group and its working groups.

Second, MTConnect is establishing links to other standards and data models that already exist or are in development. Data on personnel, for example, are already well-defined outside of MTConnect. Data definitions for entities such as 'operator' or 'user' will allow MTConnect data to be associated in a useful way to data about performance, attendance, training issues and other 'people factors'.

Many industries must work together to realize a future for self-aware manufacturing systems and artificial intelligence. Standards may seem tedious or esoteric, yet they are the glue that joins all the pieces together and helps technology move forward in a coherent and unified manner.

Standards may seem tedious or esoteric, yet they are the glue that joins all the pieces together and helps technology move forward in a coherent and unified manner.



Source: Modern Machine Shop

Graphic representation of how MTConnect helps standardize communication.

GEARED UP TO GROW

SMEs are slowly but surely taking cognizance of the advantages automation brings to the table. Sure of the inevitable automated future, New Engineering Works has adopted it into its processes with the aim to evolve and grow.

New Engineering Works' Gudel Gantry. The company presently has two of them for six CNC machines.

Source: New Engineering Works

POONAM PEDNEKAR
Chief Copy Editor
Magic Wand Media Inc
poonam.pednekar@magicwandmedia.in

Automation has been transforming factory shop floors for some time now, hugely impacting economics and efficiency of the manufacturing sector. There has been a deluge of technologies that encourage humans and machines to work side by side and bring out the best in each. The Indian manufacturing sector too has begun reckoning the value automation ensues. Warming up to it, our major players, such as Tata Motors Ltd, Maruti Suzuki India Ltd, Bajaj Auto Ltd, and Ford India Pvt Ltd, have adopted large-scale automation.

Paving the way

However, it's the SMEs that compose most of the Indian manufacturing industry and a favorable change will be realized only when they start to embrace and adopt it. On the bright side, some Indian SMEs have been paying heed to what the future holds and have begun their journey with automation. Incepted in 1996, New Engineering Works is an SME who has come out of its comfort zone and has woken up to the fact that the future belongs to Automation.

The company manufactures various auto components for commercial vehicles and its major customers include Tata Motors, Cummins India, and Brakes India. In the near future, it would also start supplying to Automotive Axels. Steel City Metal Products and Autotec Engineering are two of New Engineering Works' other plants.

Tryst with automation

Along with conventional machines, the company's setup also includes 48 CNCs, 16 VMCs and 3 VTLs. The company bought its first robot in 2017, which worked on two machines. The results were highly encouraging; along with economic benefits, it was observed that there was a spike in the operators' interest at work. Divesh Debuka, CEO, New Engineering Works, speaks on the company's decision to opt Automation, "The future is of Automation. It is something that none of us will be able to do without going ahead. The issues that will make it a necessity include dearth of skilled labor, stringent timelines, and quality standards, etc. Hence, we thought it was better to start early on and become a market leader in terms of automation and have deployed robots, cobots, and gantries on our shop floor."

Present scene

New Engineering Works bought six cobots from Universal Robots (UR) over a period of two years. "As an SME, we are UR's biggest customer in the country. Since we procured so many machines in a short period of time, the company gifted us a special edition cobot which they call 'golden robot'. We have deployed this cobot in an anti-rust application, whereas the other six cobots are deployed on CNC machines for machine tending applications," he informs.

As of today, the company has two Gudel Gantries catering to six CNC machines, six UR Cobots for 12 CNC machines, and two Yaskawa Robots for four CNC machines. "The plans are on for a new fully automated plant which will have three cells, with each cell having four machines and two robots, and more to come in the near future," he adds.

Benefits galore

Below are a few advantages of automation that New Engineering Works has experienced over a period of time:

Increase in productivity: "There has been a substantial increase in our productivity while using cobots. The efficiency of the labor is inconsistent but it is not the case with robots. Hence, the output from the machines is consistently high," shares Debuka.

Easy to deploy: Cobots are extremely easy to deploy on the shop floor. In the company's case, UR cobots did not occupy a very large space. The space between two machines in a regular shop floor is more than enough for the cobots to be installed. These cobots do not even require fencing as they are human-friendly.

Easy to use: For the company, operating cobots turned out to be as easy as using a smartphone. The operators on the shop floor had to be given a minimal training initially, without requiring a special person for automation.

Source: New Engineering Works

"There is no point resisting Automation. The manpower has to appreciate and the system is to depreciate. The comparative cost analysis favors this investment. Moreover, it is important to understand that robots are not to replace humans but assist them.**"**

Divesh Debuka
CEO
New Engineering Works

Better utilization of manpower: Tending operations are boring and monotonous. With robots around, one does not need an operator for each and every machine to tend to it. Deploying a cobot for two or three machines and getting one person to manage them is sufficient. That way one can reduce workforce by hundreds if they have a large machine shop.

Consistency: In the long run, one needs to be consistent to emerge on top of their game. "Consistency in quality, quantity, delivery, etc. is a key requisite in successfully catering to the ever-changing market demands. Automation can be a major aid in ensuring that you do not fail on your commitments," says Debuka vouching for the company's cobots.

Cost savings in the long run: "One person can easily manage a cell with two cobots and four machines. Additionally, one saves a lot by the way of fewer rejections and increased productivity," he adds.

If one diligently plans on automation, one can substantially reduce manpower cost and deliver better quality.

Source: New Engineering Works

The company has deployed two Yaskawa Robots for four CNC machines.

FROM IDEA TO REALITY

Imaginarium India's success story of making India's first electric hypercar, the Shul, happen and how!

Source: Imaginarium India Pvt Ltd

The Shul, India's first electric hypercar

When Chunky Vazirani designed and executed his electric hypercar concept, he knew traditional prototyping wouldn't make the cut. As he explored various 3D printing service bureaus in Mumbai, he chanced upon Imaginarium India Pvt Ltd and realized it could meet the quality and expertise level that was required to bring his idea to life.

Challenges

The Shul, as opposed to many others that came before it, is a concept car designed for function, performance, and aesthetics rather than manufacturability. This made it possible for the Shul to gain in terms of aerodynamics and introduce new elements such as side view mirror cameras. However, designing on software was one thing, realizing it was a totally different ball game. Although aware that additive manufacturing was the technology with which it was possible to print almost anything one imagined, Vazirani had his fair share of doubts – Which technology would be the best to print the Shul's parts? Could the designs be printed? What would be the post-printing process needed? Would it be feasible and practical to 3D print the parts? And most importantly, who could answer all these questions?

Solution

With the wider acceptance of the technology from a significant number of players in the market, Vazirani was able to shortlist a few and try his luck. Visits to a few service bureaus with tall claims soon left him with unusable 3D printed parts, a lighter pocket and the same cluelessness regarding the feasibility of the project.

At Imaginarium, Vazirani, at first, got his design iterations printed in entirety in multiple scale models. Happy with the output, he consulted the company experts who not only helped him choose the parts that were feasible to 3D print, but also gave him an insight into the technology, the material, and the post processing as per his quality requirement. The Shul now had its 3D printed fins, side view mirror cameras, logos to be displayed on the car, and fenders using high-end HP multijet fusion and SLA technologies, giving it all the perfect sturdiness and quality. The post processes carried out on the parts helped the Shul maintain its look and feel, making it one of the most hassle-free print and plug operations.

> **"Quality is something that we respect. That makes us love to work on more projects with Imaginarium."**
>
> **Chunky Vazirani**
> **Founder & Chief Designer**
> **Vazirani Automotive**

Source: Team MMI

Challenge

For the Shul, the traditional prototyping required multiple vendors for material sourcing, hand tooling the mould, processing the mould for casting, casting, and post processes. The company could not find any additive manufacturer who could guarantee the feasibility of the project.

Solution

With 3D printing from Imaginarium, the two-week process was reduced to two days with accurate, finished parts at a much lesser cost.

Why 3D printing?

Traditionally, prototyping has not only been expensive, but it has also been one of the most error prone areas of product development for most industries. If the Shul had gone through the traditional way of manufacturing its prototype, it would have required multiple vendors for material sourcing, hand tooling the mould, processing the mould for casting, casting, and post processes. With 3D printing, the two-week process was reduced to two days with accurate, finished parts at a much lesser cost.

Source: Imaginarium India Pvt Ltd

"Our team of experts is always at our clients' service to evaluate their projects, identify their requirements and suggest the right approach. But, most importantly, we ensure they never have quality-related issues."

Nishant Shah
Director
Imaginarium India Pvt Ltd

Source: Imaginarium India Pvt Ltd

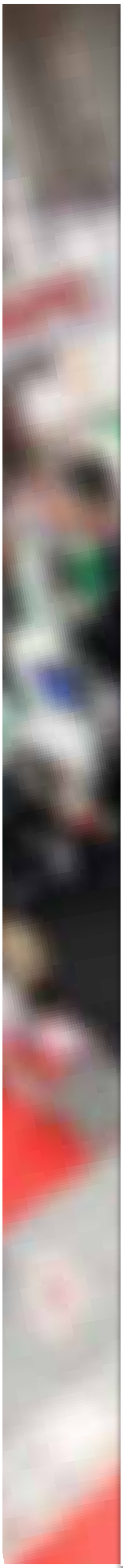
The HP MultiJet Fusion 3D Printers create production grade parts

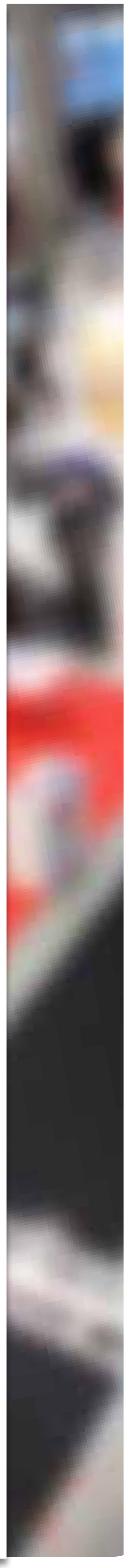
Why Imaginarium?

Replying to which, Nishant Shah, Director, Imaginarium India, says, "We, with an experience of over a decade, have been consistent in our results and by now, industry players trust us to seek our advice."

"Our team of experts is always at our clients' service to evaluate their projects, identify their requirements and suggest the right approach. But, most importantly, we ensure they never have quality-related issues. Our clients including Mr Vazirani can vouch for it," he adds.

If the Shul had gone through the traditional way of manufacturing its prototype, it would have required multiple vendors for material sourcing, hand tooling the mould, processing the mould for casting, casting, and post processes.





EVENT CALENDAR

EVENT NAME	CONTACT	DATE & VENUE
HANNOVER MESSE 2019	www.hannovermesse.de/en/	April 01–05, 2019 Hannover Exhibition Grounds Hannover, Germany
2ND INTERNATIONAL SYMPOSIUM ON 'INDUSTRY 4.0 – THE FUTURE CONCEPT OF MANUFACTURING'	T: 033 4060 2364 E: events@vdmaindia.org www.india.vdma.org	April 25, 2019 Hotel Narayani Heights Gandhinagar Gujarat, India April 26, 2019 Radisson Blu Hotel Egmore, Chennai Tamil Nadu, India
EXPOMAFE	T: 11 3598 7810 E: expomafe@informa.com www.expomafe.com.br	May 07-11, 2019 Sao Paulo Expo Exhibition & Convention Center Sao Paulo, Brazil
METALTECH 2019	T: +65 6233 6688 E: machine-isoa@ubm.com www.metaltech.com.my	May 15-18, 2019 MITEC Kuala Lumpur, Malaysia
MOULDING EXPO	T: +49 7111 85600 E: info@messe-stuttgart.de www.messe-stuttgart.de/moulding-expo/en/	May 21–24, 2019 Stuttgart Trade Fair Centre Stuttgart, Germany
METALLOOBRABOTKA	T: +7 (499) 795 3843 E: metobr@expocentr.ru www.metobr-expo.ru/en/	May 27–31, 2019 Expocentre Fairgrounds Moscow, Russia
INTEC 2019	T: +91 422 222 2396 E: intec@codissia.com www.intec.codissia.com	June 06–10, 2019 CODISSIA Trade Fair Complex Coimbatore, India
MTA VIETNAM 2019	T: +65 62336638 E: events.ses@ubm.com www.mtavietnam.com	July 02–05, 2019 SECC Ho Chi Minh City, Vietnam
DELHI MACHINE TOOL EXPO (DMTX) 2019	T: +91 80 6624 6600 E: info@imtma.in www.mtx.co.in	August 08–11, 2019 Pragati Maidan New Delhi, India
EMO HANNOVER 2019	T: +91 22 6687 550 001 E: info@hmf-in www.emo-hannover.de	September 16–21, 2019 Hanover Fairground, Messegelände Hannover, Germany
CHENNAI MACHINE TOOL EXPO (CMTX) 2019	T: +91 80 6624 6600 E: info@imtma.in www.mtx.co.in	September 26–29, 2019 Chennai Trade Centre Chennai, India
MTA HANOI 2019	T: +65 6233 6688 E: machine-isoa@ubm.com www.mtahanoi.com/en-us/	October 16–18, 2019 Hanoi, Vietnam
METALEX 2019	T: (+66) 2686 7222 E: contactcenter@reedtradex.co.th www.metalex.co.th	November 20–23, 2019 BITEC, Bangkok, Thailand

To suggest an event, please send details to soumi.mitra@magicwandmedia.in

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IMTEX 2019 & TOOLTECH 2019: THE GRANDEST EVER

With IMTEX 2019 being the trade show's golden anniversary edition, Indian Machine Tool Manufacturers' Association (IMTMA) organized it in a never-seen-before avatar. Along with showcasing the cutting-edge trends and technological refinements from India and other global players, it prepared the participants for the manufacturing scene the future is to pan out.

Source: Magic Wand Media

Industry veterans during the lamp lighting ceremony

The golden anniversary edition of IMTMA's flagship event for the metal cutting industry, IMTEX turned out to be exactly what was expected of it. Held at its regular venue, the Bangalore International Exhibition Centre (BIEC) from January 24 – 30, 2019 in Bengaluru, South and South East Asia's apex machine tools exhibition was unparalleled in all aspects along with being bigger and grander than ever before. Exhibiting the latest trends as well as technological refinements from India and other global players, the event had Tooltech 2019 as its partner that ran parallel to it and showcased machine tool accessories, metrology and CAD/CAM cutting tools, tooling systems and current trends in the tooling industry.

The mega dual event, which took place in a sprawling total area of 77,500 sq mt, housed 1,222 exhibitors from 26 countries and seven country pavilions and attracted 91,446 visitors from a wide spectrum of manufacturing and ancillary industries including key decision and policy makers as well as industry captains keen to source latest technologies and

Source: Magic Wand Media

Source: Magic Wand Media

POONAM PEDNEKAR
Chief Copy Editor
Magic Wand Media Inc
poonam.pednekar@magicwandmedia.in

manufacturing solutions for their product lines.

Optimism prevails

IMTEX 2019 & Tooltech 2019 witnessed an unprecedented show of solidarity from the manufacturing community at its inauguration. The veterans proudly reflected on how far we, as a nation, have reached in the global manufacturing landscape and deliberated on filling the gaps to make wide strides to reach our goals.

Shri HD Kumaraswamy, Hon'ble Chief Minister of Karnataka, did the honors of inaugurating the show in the presence of Shri RV Deshpande, Hon'ble Minister for Revenue, Government of Karnataka; Shri KJ George, Hon'ble Minister for Large & Medium Scale Industries, Government of Karnataka; Vikram Kirloskar, Vice President, Confederation of Indian Industry (CII); and Ram Venkataramani, President, Automotive Component Manufacturers Association of India (ACMA).

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"We are at the beginning of a promising year for the Indian economy. India's GDP forecast for the current fiscal is 7.3 to 7.4 percent growth. I am sure that in the forthcoming financial year 2019-2020, we will see more vibrancy and robustness," said P Ramadas, President, IMTMA.

"Manufacturing is witnessing good growth in the country. The industry now needs to tap the various opportunities which are rising in defence, aerospace and other sunrise sectors. This will further open doors for research and innovation. This will also supplement the industry's export potential besides strengthening 'Make In India' and taking manufacturing sectors contribution to 35 percent of the country's GDP," he added.

Source: Magic Wand Media

(L-R): Indradev Babu, Vice President, IMTMA; Tim Shinbara, The Association for Manufacturing Technology, USA (AMT); P Ramadas, President, IMTMA; V Anbu, Director General & CEO, IMTMA, during the opening ceremony of ISMT

Commending the machine tools industry on its growth, Shri RV Deshpande, said, "I have been very closely associated with IMTMA for the past few years. I applaud the association's efforts for taking the Indian machine tools industry to the global height. Almost up to 1995, we did not have any big automotive manufacturer in the country. Today, we have so many. This has been possible only because of the growth of the machine tools industry. In Karnataka itself almost 120 companies are engaged in machine tools manufacturing."

Seconding him, Kirloskar noted, "The automobile and the auto industry both are globally expanding and the high-quality products are possible because of our machine tools industry's development." He cited three major areas – Energy Security, Environment and 'Make in India', where a long-term policy is needed and put forth his request to the union government to frame them.

Clearly proud to have IMTEX in the state of Karnataka, Shri Kumaraswamy said that he is glad to host all national and international guests in the state. "Today, the entire world knows Bangalore. This exhibition is of great significance to the Indian machine tools industry. I am glad to inform that Karnataka is the first state to declare the aerospace policy. We are working on providing a dedicated space to set up this industry. We are also working on setting up our exhibition center close to the airport."

Source: Magic Wand Media

(L-R): Stefano Corradini, Group Director Marketing, Marposs SpA, Italy and SM Sood, MD, Marposs India Pvt Ltd at the company's booth

Source: Magic Wand Media

(Second from left): Punit Gupta, MD, Blaser Swisslube India along with the Team at the company booth.


Source: Magic Wand Media

Rajendra Jain honored with IMTMA-Doshi Award


Source: Lakshmi Machine Works Ltd

Seventeen institutions from Bangalore and 33 from outside, including two IITs, took part in the i2 Academia Pavilion at the show.

Concurrent sessions

In conjunction with IMTEX 2019 & Tooltech 2019, the 8th International Seminar of Machining Technologies (ISMT) was held a day before the week-long metal working event with 'Powering Manufacturing Growth and Competitiveness' as its theme.

"The challenge for manufacturers is to decide on which technology to pick up and how to use it. Out of several modern technologies, perhaps the Augmented Reality will witness adoption at a highly accelerated scale of 40.29 percent. Technologies like Additive Manufacturing and Generative Design will change the entire traditional approach of designing and manufacturing products," noted Tim Shinbara, The Association for Manufacturing Technology, USA (AMT), in his keynote session.

Some interesting topics that renowned speakers from across the industry spoke on included: 'New features for large part machining' by DMG Mori, Germany; 'Designing for Additive Manufacturing' by Renishaw plc, UK; 'Connected Solution for Digital Machining' by Sandvik Coromant, India; and 'Overcoming Challenges in Difficult-to-Machine Materials' by Toshiba Machine, Japan.

In a bid to forge the highly crucial Industry-Academia bond, IMTMA called upon academic institutes to display their innovations and closely gauge industry requirements.

Seventeen institutions from Bangalore and 33 from outside including two IITs took part in the i2 Academia Pavilion at the show. Although most of them displayed their R&D projects through posters, a few gave live demonstrations of their innovations.

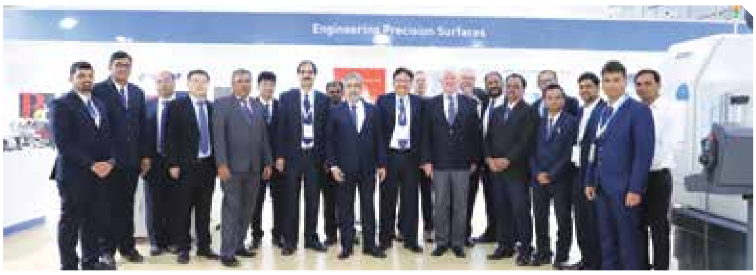
A seminar was arranged to familiarize Indian manufacturing industry with the techno-commercial advantages of AM. The topics covered included: 'Overview of AM'; 'Fused Deposition Modelling, Multijet Modelling and CLIP'; 'Design for AM (Direct and Hybrid)'; 'Direct Metal Laser Deposition / Hybrid Manufacturing Laser Metal Deposition'; and 'Tailoring Properties of Parts made by Additive Manufacturing'. A guided tour to AM Pavilion and Factory of the Future followed.

Awards and recognition

Following its tradition of encouraging ideas, innovations and vision in Indian machine tool sector, FIE Foundation awarded companies for their path-breaking innovations at IMTEX 2019 & Tooltech 2019.

Instituted in memory of Vinod Doshi, one of the founding fathers of IMTMA and an outstanding industrialist, this year's IMTMA - Vinod Doshi Premier Outstanding Entrepreneur Award was presented to Rajendra Jain, Managing Director, ITL Industries for his entrepreneurial excellence and unique leadership style.

In order to promote sustainable lifecycle practices in exhibitions that balance quality, environment and economics with compliance to health and safety obligations, IMTMA, at IMTEX 2019, constituted the Eco Design Award. The award considered environmental and cost-effective design, reduced resource consumption during booth con-


Source: Magic Wand Media

Wendt team at IMTEX 2019 & Tooltech 2019


Source: Magic Wand Media

Quiz session in progress.

Team Jyoti CNC @ the booth in IMTEX 2019 & Tooltech 2019

Source: Magic Wand Media

Source: Magic Wand Media

struction, reduced pollution during set up, minimal waste post use, and re-use of the materials. The long list of awardees included Dahanukar Machine Tools, Exim India Pvt Ltd, Perform Coat Europe AG, Dynascan Inspection Systems Company, Hawe Hydraulics Pvt Ltd, and Pratap Tex Chem Pvt Ltd.

Exhibits and reviews

Industry players who have once participated in IMTEX know its reach and are aware of the extent of opportunities that make way through the medium.

"The latest edition yet again offered us an ideal ground to interact and engage with present and prospective customers who visited our booth. This helped us in understanding the market needs for us to offer better solutions and services to our customers, prospects and industry partners," said Pramod Kore, General Manager, Service & Tech Support, Yamazaki Mazak India Pvt Ltd.

"Each year, IMTEX pushes us towards the next level of performance and success, consistently being there as a guiding force," said P Jadeja, Chairman & Managing Director, Jyoti CNC Automation.

Renishaw Metrology Systems Ltd was a proud participant at Additive Manufacturing (AM) Pavilion and showcased RenAM 500Q, its multi-laser AM system featuring four high-power 500W lasers. Also sharing the space was Imaginarium India whose Director, Nishant Shah, ensured that the visitors became aware of the importance of AM in prototyping in today's fast-growing development cycles.

Carl Zeiss India (Bangalore) Pvt Ltd exhibited its PiWeb, a scalable IT solution for quality data management.

Blaser Swisslube India, through its Liquid Tool, showed its prowess in metalworking fluids and highlighted Synergy 735, a crystal-clear, innovative, water-miscible and oil-free metalworking fluid. On the other hand, Zavenir Daubert India Pvt Ltd too showcased its stable of eco-friendly and metalworking fluids that included neat and water-soluble cutting oils and rust preventive solutions.

According to Shuhei Matsui, General Manager – CNC Systems, Mitsubishi Electric India Pvt Ltd, "IMTEX is an ideal platform for CNC manufacturers to showcase advanced technological products and interact with various machine tool builders as well as end-users." The company displayed its latest product line-up of controllers consisting M80, M800, C80 and E80 along with motors and amplifiers.

Another specialist in precision CNC rotary tables and gear hobbing solutions for machine tool applications, UCAM Pvt Ltd, displayed 22 varieties of tables, all of which were new or improved. The new MINT series of tables called the URX and URXH series have new and vastly improved features.

In order to showcase new technologies for advanced manufacturing, Marposs India Pvt Ltd had a dedicated booth in the exclusive Industry 4.0 pavilion at the show.

The Ace Micromatic Group displayed 35 CNC machines at its over 20,000 sq mt stall, which were a mix of high technology and innovative products. A few were import substitutes

To encourage ideas, innovations and vision in Indian machine tool sector, FIE Foundation awarded companies for their path-breaking innovations at the event.

First Prize

Source: Magic Wand Media

UCAM Group at the company booth at IMTEX 2019 show.

Source: Magic Wand Media

Source: Kumar

Felicitation of Godrej family members

Source: Ace Micromatic Group

(Third from left): Dr Vishwas R Puttige, Business Head, amace Solutions Pvt Ltd along with the team at the company booth

The 8th International Seminar of Machining Technologies (ISMT) was held with 'Powering Manufacturing Growth and Competitiveness' as its theme.

and the new launches included CNC machines for alloy wheel machining, hard part turning, graphite machining, multi-pallet HMCs, high speed drill tap centers, twin spindle lathes and VMCs, plus its new range of SPMs.

Innovative launches

At IMTEX 2019, Jyoti launched seven new machine variants covering different clusters and segments. A new chucker with autoloader was launched that reduces human interface with cost-effective automation solution. Under VMC series, a smaller version of VMC with NVU features was displayed. A compact version of VTL series now completes the range. The MX 9 NVU is another 5-axis universal machining center.

Innovating constantly, Lakshmi Machine Works Ltd (LMW) launched a 5-axis simultaneous VMC, the JU 60 that provides high speed and accuracy in complex part machining with a built-in spindle of 15,000 rpm.

Mastercam India found IMTEX 2019 the best place to launch its quarterly India Newsletter that will focus on the company's success stories with its customers. It also ran special offers at its booth to encourage SMEs to have Mastercam as their preferred CAM solution. The company showcased the most recently released Mastercam 2019 along with the support for diverse metrology hardware through the Verisurf product range.

Showcasing its new range of products for the Aerospace industry under the sub brand VP Aero, VP Industries launched a wide range of cutting tools including solid carbide round tools and indexable tools.

MotulTech metalworking fluids, SAFKOOL 6220 and SAFKOOL 6420, mainly used in machining processes including turning, milling, threading, grinding, gearing, boring, drilling and sawing, were highlighted. While the latter is a high-performance, semi-synthetic soluble concentrate suited for machining processes with a very high cooling power, the latter is a soluble concentrate specially designed for processes requiring a minimum water foam of TH 5 - 80° F.

Francis Klein & Co. Pvt Ltd, among its wide range of products, also displayed deburring and superfinishing machines from Nagel Special Machines which have been developed in-house for the Indian two-wheeler industry.

S&T Group showed its latest VMC, VF 1000 with a cutting speed rate of 20,000 mm/min which makes the machine suitable for high-speed machining.

From its gear manufacturing systems, Gleason Works India focused on its brand-new 200SVP Gear Shaving Machine, latest developments in workholding, cylindrical and bevel gear manufacturing tools (Pentac® Mono RT), Gleason Connect + Smart Glasses for

Source: Magic Wand Media

(L-R): Sanjay Sangam, National Sales Head, Renishaw India; Chief Guest TR Parasuraman, Dy MD, Toyota Industries Engine India; Paul Gallagher, VP and Director, Renishaw APAC; and Paul Weaver, VP, Renishaw India present during the Smart Factory Launch

Source: Magic Wand Media

(L-R): Junya Ueda, Manager, International Business Development, Asia Turning Machine Sales Machine Tools Division, MURATA MACHINERY LTD and AV Srinivasan, CEO, Meiban Engineering Technologies Pvt Ltd, at the company booth.

Source: Magic Wand Media

(L-R): Mahesh K Desai, Sr Vice Chairman, EEPC India; TK Ramesh, MD & CEO, Micromatic Machine Tools Pvt Ltd and MG Srinivas, Executive Director, Association Initiatives, BIEC, IMTMA at the Buyer-Seller Meet.

Source: Magic Wand Media

(L-R): Sunil Rao, Dy MD, DMG MORI India Pvt Ltd; Dr Masahiko Mori, President, DMG MORI Co., Ltd and Shinji Miyamoto, MD, DMG MORI India Pvt Ltd addressing the media

Source: Toyoda Micromatic Machinery India Pvt Ltd

(R-L): H Kaijima, Sr. Executive Director, JTEKT Corporation, Japan; S Kato, Executive Director, JTEKT Corporation, Japan; M Ido, Managing Officer, JTEKT Corporation, Japan; H Omura, Chairman, JTEKT Group-India; S K Yadav, Director, Toyoda Micromatic Machinery India Pvt Ltd and M Nagasawa, Managing Director, Toyoda Micromatic Machinery India Pvt Ltd

remote service support and KISSsoft gear and transmission design software.

Chiron India Machine Tools Pvt Ltd displayed its high-precision, high-productive Twin Spindle VMC. The DZ 12 W model is equipped with 2x32 HSK A50 Automatic Tool changer and Fanuc 31iB5 CNC system.

TaeguTec India had over 50 families of products on display at IMTEX 2019 which included around 700 tools and solutions spread across turning, milling, parting, grooving, drilling, and special tooling applications.

DMG MORI India Pvt Ltd showcased its 3rd Generation DMU 50 that has harmonizes the modern appearance of the design with user-friendly operation. It achieves a unique degree of precision of less than 6 µm that is unbeatable in this segment.

Many more to come

IMTEX 2019 was the last edition of the metal cutting exhibitions that gained an overwhelming response from the global manufacturing industry and attracted exhibitors and visitors from far and wide. The next edition of IMTEX, going by its tradition, is slated to be yet bigger. It will be held in 2021 at the Bangalore International Exhibition Centre.

The next edition of IMTEX is slated to be yet bigger. It will be held in 2021 at BIEC.

Source: Magic Wand Media

Pardeep Aggarwal, General Manager, Gleason Works (India) Pvt Ltd at the company booth

Source: Magic Wand Media

L-R: Olivier Vergnes, Marketing Manager, MotulTech and Yatendra Kumar, Business Head, MotulTech at company booth

Source: Magic Wand Media

Vikram Salunke, Managing Director, Accurate Gauging & Instruments Pvt Ltd at the company's booth

Winners of the FIE Foundation Awards

Exhibitor	Products
Central Manufacturing Technology Institute	Ultra Precision Turning
Machine – Nanoshape T-250	NFX800B-MPS Intelligent Multi-Axis Flexible Manufacturing System
UCAM Pvt Ltd	Direct Drive Mill Turntable
Kennametal India Ltd	5 Axis CNC Micro Tools Grinding Machine
Fenwick & Ravi	Angular Mill Head
Imaginarium Rapid Pvt Ltd	Rapid Online Factory
Sahjanand Laser Technology Ltd	Multi-tasking Laser Machine – NANO
Abhijat Equipments Pvt Ltd	Ergonomically – Designed CNC Turning Machine – Turboturn 20
Dynascan Inspection Systems Company	Rapid Profile Projector
Strategi Automation Solutions Pvt Ltd	Compliant Mechanism
Sunita Engineering Corporation	5 Axis CNC Desktop Milling Machine-JewelMill-5XW

SWW2019: WHERE USERS AND PROVIDERS MEET!

Alike all its predecessors, this year's SOLIDWORKS WORLD (SWW) also witnessed a huge convergence of enthusiastic user and community members at Kay Bailey Hutchison Convention Center in Dallas, Texas from February 10 – 13, 2019. Themed around 'Where Possibility Takes Form', SWW 2019 housed around 6,000 attendees from far-fetched corners of the globe.

Source: Magic Wand Media

Bernard Charlès, Vice Chairman of the Board and CEO, Dassault Systèmes showcasing how Jaipur Smart City used the 3DExperience platform to better the lives of the citizens

SWW 2019 kicked off on a thunderous applaud from the audience at the entry of Gian Paolo Bassi, CEO, SOLIDWORKS, Dassault Systèmes on the stage. Sharing his thoughts on how rather than focusing on tools and features, the company is looking at the bigger picture such as knowledge and know-how, he introduced 3DEXPERIENCE. WORKS, which is designed to extend the ease of use and reach of SOLIDWORKS. 3DEXPERIENCE. Works brings the power of the Dassault Systèmes 3DEXPERIENCE Platform to SOLIDWORKS users with additional resources and capabilities.

3DEXPERIENCE.Works

With the introduction of 3DEXPERIENCE.WORKS, Dassault Systèmes announced the tying together of planning (ENOVIA), design (SOLIDWORKS), simulation (SIMULIA), and manufacture (DELMIA) through the Dassault Systèmes software portfolio. 3DEXPERIENCE.WORKS will allow small and mid-sized companies to perform their work using a single cohesive digital environment instead of using a complex series of point solutions that require jumping between applications and interfaces. It connects data and streamlines product development processes by providing dashboard templates, managed services, access to industry-focused communities and user groups, and applications specific to a variety of job roles. As 3DEXPERIENCE.WORKS is cloud-based, it will provide computing horsepower and promote collaboration due to its accessibility. Against this

Source: Magic Wand Media

Gian Paolo Bassi, CEO, SOLIDWORKS, Dassault Systèmes, introducing 3DEXPERIENCE.WORKS to the enthralled audience

Source: Magic Wand Media

Manish Kumar, SOLIDWORKS, R&D, Vice President, Dassault Systèmes hosting the maiden R&D session at SWW2019

SOUMI MITRA
Editor-in-Chief
Modern Manufacturing India
soumi.mitra@magicwandmedia.in

backdrop Bassi stated, “Connected 3DEXPERIENCE.WORKS will help us lead the way for an Industrial Renaissance.”

Taking the center stage, Bernard Charlès, Vice Chairman of the Board and CEO, Dassault Systèmes, emphasized, “3DEXPERIENCE.WORKS will make you story makers. The story will be the experience.” Quoting success stories from myriad sectors across the world, he cited the example of Jaipur, Rajasthan where the government is deploying the 3DEXPERIENCE to better the infrastructure of the city under the Jaipur 3D City Project. “We provide business and people with 3DEXPERIENCE Universe to imagine sustainable innovations capable of harmonizing nature, product and life. Our aim is to connect all the dots to deliver best solutions for your clients,” he further added.

Collaboration matters

RIZE Inc., an additive manufacturing company, announced its strategic business partnership through an investment by Dassault Systèmes and SOLIDWORKS. This investment is part of a bigger Series B round of funding that raised $15 million for RIZE. With the partnership, SOLIDWORKS and RIZE will work together to explore integrating SOLIDWORKS software and RIZE printers. With its production of zero harmful emissions, using relatively safe, recyclable materials and with minimal pre- and post-processing, RIZE is hoping its Augmented Polymer Deposition (APD) process will drive adoption and sustainably among its users.

Source: Magic Wand Media

Andy Kalambi, President & CEO, RIZE Inc. and Kishore Boyalakuntala, Vice President of Product, Rize Inc., at the Partner Pavilion

Source: Magic Wand Media

(L-R): PM Ravikumar, Senior Director, SOLIDWORKS India and Suchit Jain, Vice President, Strategy & Business Development, Dassault Systèmes told the media that last year the company added around 1300 new companies into Solidworks from India

Commenting on the partnership, Andy Kalambi, President & CEO, RIZE Inc., said, “Dassault Systèmes is the world leader in driving sustainable innovation. We are delighted to partner with them to ensure that every part that is designed in SOLIDWORKS comes with a haptic experience that enables everyone in the value chain to collaborate, communicate and innovate.”

Both companies jointly stated that one of the goals of their partnership was to make additive manufacturing more inclusive. “Design for additive manufacturing is one of our priorities, and to get it right, you need the rich set of applications from generative methodologies, material science and advanced simulation available on the 3DEXPERIENCE Platform,” said Bassi.

Partner Pavilion

There was a participation of significant 3D printing companies in the Partner Pavilion. Additive Manufacturing surely was the thing as there were 3D printer manufacturers such as 3D Systems, BigRep, Desktop Metal, Formlabs, MakerBot, Markforged, Rize, Sindoh, Stratasys, and Ultimaker to service providers like Forecast 3D, Protolabs spread in the floor. The Partner Pavilion also included a gaming lounge, fablab setup, shop floor, design booths for challenges, and several hands-on technologies.

Source: Magic Wand Media

Winners of AAKRUTI 2018 along with their mentor at the Education Zone

Source: Magic Wand Media

Marie P Planchard, Director Education & Early Engagement, SOLIDWORKS orienting the media about the company's academia-industry initiatives

Education Zone

For the first time, the Partner Pavilion featured an exclusive Education Zone Product Showcase providing a sneak peek into the future of 3D design. This area sported a variety of versatile products designed in SOLIDWORKS by students from engineering colleges across the world. From India, there was an impressive student representation from academic institutions such as Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded, that also bagged the first position in AAKRUTI 2018 design contest; Vishwakarma Institute of Technology, Pune; National Institute of Technology, Raipur; Poornima College of Engineering, Jaipur; Pune Vidyarthi Griha's College of Engineering and Technology; Indian Institute of Technology, Kharagpur; Bannari Amman Institute of Technology, Sathmangalam; and SRM Institute of Science and Technology, Chennai.

What's in store

There is a lot slated to appear in the next edition of the event too. Stay tuned to be in the know.

The next year, SOLIDWORKS WORLD will be held from February 9 – 12, 2020 at Nashville, Tennessee, and will be reincarnated as 3D EXPERIENCE World.

TIMTOS 2019: SCALING NEW HEIGHTS

Co-hosted by Taiwan External Trade Development Council (TAITRA) and Taiwan Association of Machinery Industry (TAMI), Taipei International Machine Tool Show (TIMTOS) 2019, held from March 04–09, 2019, not only offered the visitors the latest and the most advanced in machine tools, but also raised its game to become the third largest in the world.

Source: TAITRA

(L-R): James C F Huang, Chairman, TAITRA (8th from left); Suo-Hang Chuang, Vice Chairman, Development Council, TAITRA (13th from left); Alex Ko, Chairman, TAMI (14th from left); Jui-Hsiung Yen, Chairman, TMBA (17th from left); Dr Chung-chieh Lin, Commissioner, Department of Economic Development, Taipei City Government (18th from left) during the TIMTOS 2019 Opening Ceremony

MURALI SUNDARAM
Correspondent
Magic Wand Media Inc
murali.sundaram@magicwandmedia.in

TIMTOS has been steadfastly expanding its reach over the years, soaring in popularity among the global machine tool fraternity. Living up to its repute, the latest 27th edition of the show broke its own record, emerging as the world's third largest machine tools exhibition.

Housing 1,230 exhibitors from both domestic and international regions with up to 7,000 booths used, the greatest ever in Taiwan, the trade show attracted a total of 53,777 visitors comprising 46,266 local and 7,511 overseas visitors from countries including Mainland China, India, Japan, Malaysia, Republic of Korea, Thailand, the US, Russian Federation, Singapore and Turkey.

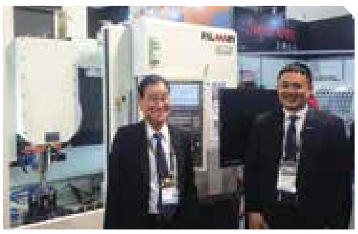
Showcasing the best

In his opening address at the inauguration of the event, James CF Huang, Chairman, TAITRA, said, "TIMTOS gathers the best and the brightest companies in the industry to showcase innovations that create innovations. Together, we can develop new products and services, and can take on the challenges of digital transformation."

Alex Ko, Chairman, TAMI, reiterated, "This year, TIMTOS has broken many new records, such as becoming the largest professional trade show in Taiwan, and the third in the world. In the future, for the machine industry and Taiwan, we shall accomplish greater achievements."

A total of 26 nations' brands were exhibited at TIMTOS 2019 that included key industry members from Taiwan, and international brands. Aside from the existing Swiss and German pavilions from past editions, exhibitors from the US, Denmark, and Turkey had country pavilions for the first

Source: TAITRA



Source: Magic Wand Media

Source: Magic Wand Media

Source: TAITRA

"TIMTOS is the perfect example: a celebration of engineering and human ingenuity on a small island nation taking on big global challenges. Together, we can shape a better world.**"**

James CF Huang
Chairman
Taiwan External Trade Development Council (TAITRA)

TIMTOS 2019 housed 1,230 exhibitors with up to 7,000 booths and attracted 53,777 visitors comprising 46,266 local and 7,511 overseas visitors.

time. The scale of the show was a new record high, with greater international participation than ever before.

Local exhibitors included Fair Friend Group (FFG); FEMCO Group; Chain-Headway Machine Tools Co., Ltd; SOCO Machinery Co., Ltd; Tongtai Machine & Tool Co., Ltd; HIWIN Corporation; Goodway; CHMER EDM; Chin Fong Machine Industrial Co., Ltd; POSA Machinery Co., Ltd; and Cosen Mechatronics Co., Ltd.

Key highlights

Industry 4.0, Smart Manufacturing, and Artificial Intelligence (AI) were the focus of this year's show. From R&D, integrated supply chains, specialized units to total solutions, TIMTOS presented itself as the ideal platform to source any tool and service one could need to optimize their operations.

TIMTOS Summit was held the second time that had industry experts offering their take on the advanced manufacturing trends. Their topics comprised of 'Machine Intelligence and AIoT', 'Additive Manufacturing', 'Innovation in Aerospace Manufacturing', and 'Automotive Manufacturing Revolution'.

Additionally, in sync with the TIMTOS 2019 theme, there were a considerable number of exhibits for new system integration and digitalized manufacturing solutions. These included robots, sensors, IoT technology, cloud platforms, and Big Data analysis.

Many domestic and international exhibitors also showcased their new AI technology and collaborative robots which are slated to assist human workforce, decrease human error and usher in unprecedented levels of productivity.

The show, for the first time, presented an 'AR Experience Zone' using Augmented Reality (AR) to demonstrate the structures of metal-forming machines. Taiwanese metal-forming machinery companies apply robotic arms, automatic die change systems, sensors, and AR applications together with production management systems and remote management to build smart production lines of sheet metal and aluminum alloy casting.

Stressing on the practical learning of post-secondary and higher education, TIMTOS every year encourages students to take part in the show. This year, the response from them was overwhelming – more than 5,200 students from 130 classes of 50 schools actively participated to have a closer view of the industry.

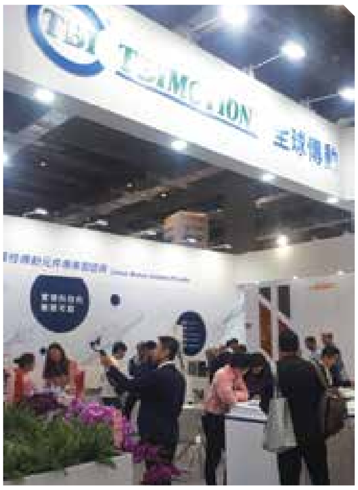
Source: TAITRA

"This year, TIMTOS has broken many new records, such as becoming the largest professional trade show in Taiwan, and the third in the world. In the future, for the machine industry and Taiwan, we shall accomplish greater achievements.**"**

Alex Ko
Chairman
Taiwan Association of Machinery Industry (TAMI)

Rewarding the most innovative

Echoing 'Industry 4.0 & Smart Manufacturing', the theme of TIMTOS 2019, smart machinery was included as a special category in the competition of Taiwan Machine Tool Industry Awards for Excellence in Research and Innovation to encourage innovation and development of the industry. There were 43 entries which were reviewed by notable committees in the field of machinery tool design and manufacturing. The competition was conducted by product categories and subcategories. Following are some of the innovative exhibits and a table with a long list of winners:



Source: Magic Wand Media

Source: TAITRA

Source: TAITRA

The show for the first time presented an 'AR Experience Zone' using Augmented Reality (AR) to demonstrate the structures of metal-forming machines.

Winners of Taiwan Machine Tools Industry Award 2019 for Excellence in Research and Innovation		
Prize	**Company**	**Products**
All CNC Machine Tools		
Supreme Excellence Award	Ching Hung Machinery & Electric Industrial Co., Ltd	HD886L – High-speed milling compound EDM
Machining Centers		
Grand Champion Award	Yeong Chin Machinery Industries Co., Ltd	NFX800B-MPS Intelligent Multi-Axis Flexible Manufacturing System
Award of Eminence	Campro Precision Machinery Co., Ltd	Vertical Machining Center (NV-1280)
Award of Eminence	Quaser Machine Tools, Inc.	UX500P APC 5 Axes Machine Center
Award of Eminence	SIGMA CNC Technology Machinery Co., Ltd	CNC Double Column Five-Axis Machining Center (Heavy Cutting) - S5A -4732HH
CNC Lathes		
Grand Champion Award	Goodway Machine Corp.	GTW-1500 Turret/Gang Tooling Multi-Axis Turning Center
Award of Eminence	L&L Machinery Industry Co., Ltd	Smart Heavy Duty Multi-Axis Complex Machine, LLS-M
Award of Eminence	Campro Precision Machinery Co., Ltd	CNC Turning & Milling Center NT-208SY
Other NC Machine Tools		
Grand Champion Award	Ching Hung Machinery & Electric Industrial Co., Ltd	RV853L-Intelligent Linear Motor Drive Wire EDM
Award of Eminence	Accutex Technologies Co., Ltd	AP+6040A+Wire EDM Machine
Award of Eminence	Top Work Industry Co., Ltd	TP-4, 4-Axis CNC Cylindrical Grinding Machine
Components for CNC Machine Tools & Other NC Machine Tools		
Grand Champion Award	HIWIN Technologies Corp.	Colling Type III, R40-16K3-FDCC3
Award of Eminence	Syntec Technology Co., Ltd	Ethernet-based Open CNC Platform-SYNTEC 220MA Series Controller
Award of Eminence	HIWIN Mikrosystem Corp.	CRE absolute resolver direct drive motor system TMY65D
Award of Eminence	Habor Precision Inc.	HIG series-DC inverter cooler HBO-N750PTSA8
Intelligent machine tools or key components for all CNC machine tools and key components		
Special Award	Yeong Chin Machinery Industries Co., Ltd	UX500P APC 5 Axes Machine Center
Award of Eminence	Ching Hung Machinery & Electric Industrial Co., Ltd	RV853L-Intelligent Linear Motor Drive Wire EDM
Award of Eminence	Syntec Technology Co., Ltd	Ethernet-based Open CNC Platform-SYNTEC 220MA Series Controller
Award of Eminence	Shieh Yih Machinery Ind. Co., Ltd	Intelligent Manufacturing Management System

Syntec Technology Co., Ltd: Sefa Bitik, Sales and Field Application Engineer, Syntec Technology, informed on the company's display including Motors, Programmable Logic Controllers / Robot Controllers, Industrial Controllers, Industrial Controller Modules, Server Motors, Computers and Peripherals.

Source: TAITRA

(L-R): Wen-Hsien Hsu, Chairman, Machine Parts and Elements Committee, TAMI; Chih-Ching Yang, Deputy Director General, Industrial Development Bureau, Ministry of Economic Affairs (MOEA); Leonor FM Lin, Executive Vice President, TAITRA; Guann-Jyh Lee, Deputy Director General, Bureau of Foreign Trade, Ministry of Economic Affairs; Alex BS Ko, Chairman, Taiwan Machine Tool Foundation (TMTF) & Chairman, TAMI; Larry Wei, Convener of Board of Supervisor, TAMI; KC Chuang, Honorary Chairman, TAMI; Ingo TH Chen, Chairman, Machine Tool Committee, TAMI, toasting TIMTOS 2019 at the event's Welcome Party.

Ing Yu Precision Industries Co., Ltd: Power Presses, Crank Presses, Eccentric Presses, High-Speed Presses are what the company specializes in. FPB-250 Fine-Blanking Press was one of its displays at the show. "The triple action presses in the FPB series are ideal for precision and complex metal stamping parts and render flatness, and straight and superior finished edges," shared Brenda Tung, Sales Manager, Ing Yu Precision Industries.

Source: TAITRA

Source: TAITRA

(L-R): CC Wang, President, TAMI; Wen-Hsien Hsu, Chairman, Machine Parts and Elements Committee, TAMI; Ingo TH Chen, Chairman, Machine Tool Committee, TAMI; Thomas Huang, Executive Director, Exhibition Department, Taiwan External Trade Development Council; and Wen Lung Hsiao, Chairman of Metal Forming Machinery Committee, TAMI, at TIMTOS Press Conference.

Keyarrow (Taiwan) Co., Ltd: Its main exhibited products included Slideway Covers, Chip Conveyors for Machine Tools, Chip and Cutting Fluid Disposal Systems, Sheet Metal & Stamping Parts, revealed Chloe Wang, Manager, Marketing, Keyarrow (Taiwan).

Soco Machinery Co., Ltd: The leading global machinery manufacturer for the Tube, Pipe and Solid Bar industry, Soco's exhibited products comprised of Metal Circular Sawing Machines, Laser Cutting Machines, Pipe Cutting Machines, Tube Bending Machines, and Wire Working Machines. Kyle Lo, CEO & MD, Soco Machinery, spoke on another new product, "The SB-52X10A-2S-V-U + Robot is an all-electric tube bender which is equipped with Left + Right Bending technology with automatic loading and unloading by a robot. Its tube bending capacity is up to O.D. 50.8 mm."

Tailift Co., Ltd: Taiwan's leading player in Material Handling and Sheet Metal Machine Tools Industry showcased CNC Turret Punching Presses, Hydraulic Press Brakes, Laser Cutting Machines, shared Jeff Lin, CEO, Tailift Co., Ltd.

TBI Motion Technology Co., Ltd: The professional transmission component manufacturer in Taiwan showcased Ball Screws, Linear Guides, Machine Parts & Accessories that cater to industries including automation, semi-conductor, medical, and robotics. The company is already the biggest ball nut manufacturer in the world, informed Chieh Lin, Executive Engineer, TBI Motion Technology.

Excetek Technologies Co., Ltd: "CNC Electric Discharge Machines, EDM Drills, and CNC Wire Cutters are our main products," shared Jimmy 4C, Y Wei, Managing Director, Excetek Technologies.

Ken Ichi Machine Co., Ltd: According to Josh Cheng, Vice Manager, Marketing, Ken Ichi Machine, the company's main products include Double Column Machining Centers; Gantry Type Machining Centers; and Vertical, Horizontal, 5-axis Machining Centers. The exhibited ones include: Compact B – Gantry Type High-Speed 5-axis Machine Center; and Linmax B – Gantry Type High-Speed 5-axis Machine Center.

Palmary Machinery Co., Ltd: "We specialize in Cylindrical and Centerless CNC Grinding Machines," informed Daphne Chiu, Area Sales Manager, Palmary Machinery. The company exhibited its high-precision CNC Internal Grinding Machine Series – NC Type.

Habor Precision Inc.: Fran Wu, Manager, International Sales Department, Habor Precision, revealed company's offerings including Industrial Cooling Systems, Hydraulic & Pneumatic Systems, Lubrication and Cooling, and Oil Mist Collectors for Machine Tools.

The response from students was overwhelming – more than 5,200 students from 130 classes of 50 schools actively participated in the show.

Gearing for the next

After a highly successful edition this year, the biennial event's next will be centered on the procurement of top-quality 'Made in Taiwan' machine tools and total solutions for the machine tool industry. Scheduled from July 01 – 05, 2021, the forthcoming event promises to continue its endeavor to showcase the best from Taiwan and all parts of the globe and keep raising its bar.

Source: TAITRA

Source: TAITRA

Source: TAITRA

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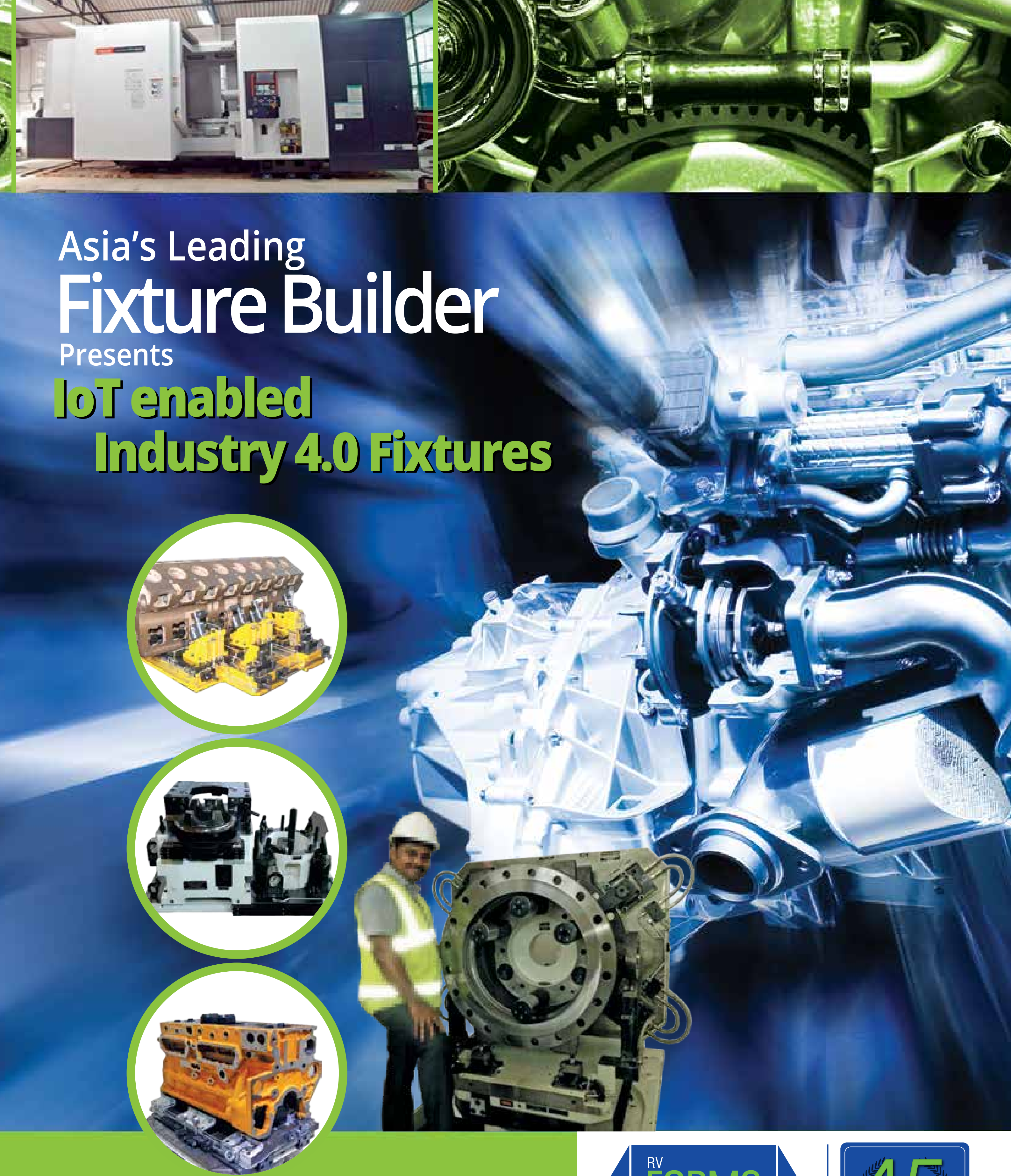
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