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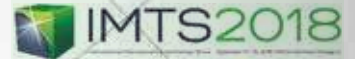


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SPECIAL FEATURE



HEADING IN THE RIGHT DIRECTION



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Dr NAGAHANUMAIHAH
Director
Central Manufacturing Technology
Institute (CMTI)

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Aristotle

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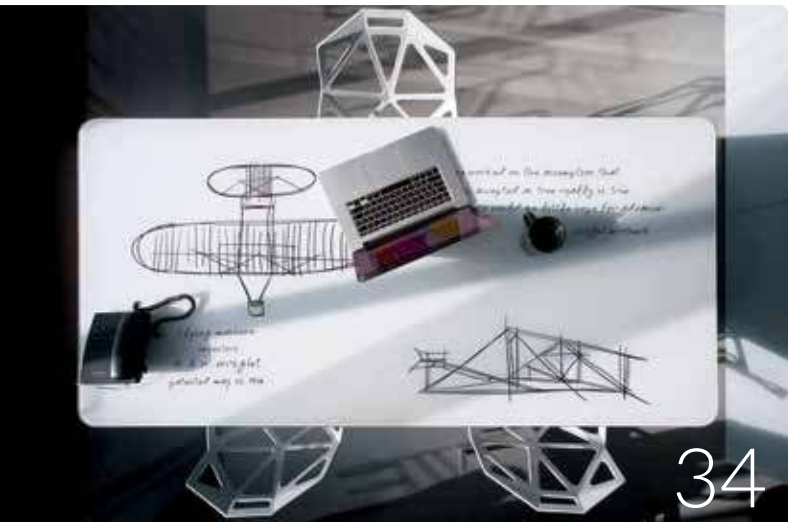
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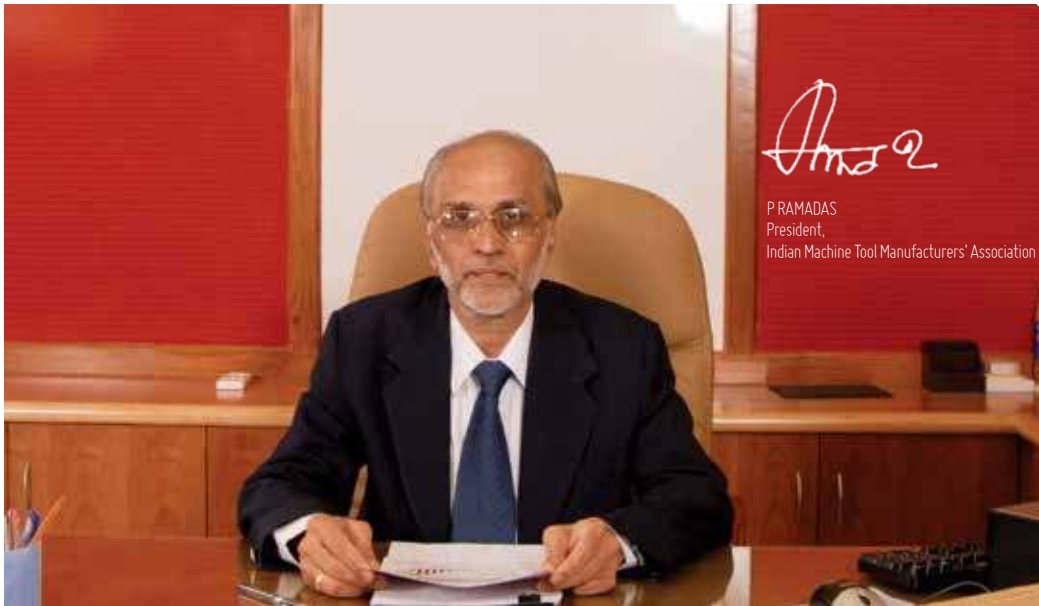
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AUTOMOTIVE INDUSTRY GROWTH TO **FUEL MACHINE TOOL INDUSTRY GROWTH**

Greetings from Indian Machine Tool Manufacturers' Association (IMTMA) and Modern Manufacturing India (MMI).

It is a pleasure for me to write the foreword for this edition which focuses on "Automotive Industry in India".

Industrial inventions are key at igniting economic growth of a country. Technology plays an important role in this.

Technological innovations fostered through greater use of artificial intelligence, robotics, internet of things and data-based networks in economical and sociological applications, and the tilt towards green industries will redefine the functioning of manufacturing industry in future.

Automotive industry embraces these changes rather rapidly to serve the aspirations of its end users. New models of cars, bikes and commercial vehicles launched by auto companies grab eyeballs. India, besides being a big consumer of automobiles, is also a major exporter of auto components to many nations, which is another factor for the growth of the automotive industry and component manufacturing industry.

Conventionally, automotive industry has been a key consumer of machine tools. The sector consumes more than 55 percent of the machine tool production in the country. The steady growth in vehicle sales is expected to have a positive impact on the demand for machine tools.

With India's automotive industry registering a production growth rate of 16.55 percent in April-June 2018 quarter, as indicated by Society of Indian Automobile Manufacturers (SIAM), machine tool industry can expect an augmented demand in the coming years.

Machine tool industry now needs to tune itself to embrace the advanced technologies as well as high precision machine tools through further investments in R&D and innovations which can match the requirements of the manufacturing industry.

Happy reading.

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President
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Dear MMI Readers,

Technologies of today are sure to become obsolete tomorrow. Change is inevitable. To sustain itself in business and make the best of it, manufacturing industry needs to keep innovating continuously. This will enable it to stay relevant in the face of rising competition. Customer aspirations and demands being in constant flux also pose a challenge to the industry. To overcome that, the industry has to have a clarity on their needs to offer them the right products and choices.

Modern Manufacturing India (MMI) endeavors to bring content to the readers from a fresh perspective by highlighting some of the latest developments in manufacturing industry. Our efforts have been streamlined to bring manufacturing sector closer to our readers. Manufacturing sector in India is also witnessing rapid changes. Technologies such as Internet of Things and Industry 4.0 are driving this change and changing the perception of manufacturing process in the country. It will be in our interest to gear up for the challenges brought forth by these changes.

MMI has catalogued these changes, and through its op-eds, articles and illustrations is bringing first-hand information to all the stakeholders so that they could make informed decisions. As ever, we continue to look forward to your feedback which will enable us to gauge your needs and act accordingly.

V ANBU
DIRECTOR GENERAL & CEO
IMTMA



Soumi Mitra

SOUMI MITRA
Editor-in-Chief
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MOVING FORWARD TOGETHER TAKES CARE OF SUCCESS!

Recently the most awaited full-month sport spectacle – Fédération Internationale de Football Association (FIFA) World Cup – concluded captivating the entire planet with its magnitude and an all-encompassing importance. The global football epidemic was an incomprehensible force that taught us several lessons that hold true for today’s marketplace.

The matches demonstrate the value of perseverance. It is tempting to call it quits when the going gets tough but sticking around and giving it your best throughout is what pays off at the end.

Football is a team and an individual sport at the same time, lending a sense of belonging to each team member. Rather than making a member feel a cog in the machine, it offers glory in plentiful to the individuals truly deserving it. The best example of it is when Croatia’s Captain Luka Modric was awarded the Adidas Golden Ball as the tournament’s best player despite his team not winning the final match.

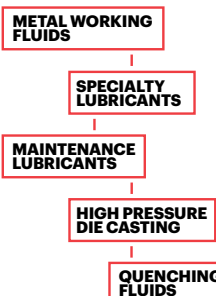
“Setting a goal is not the main thing. It is deciding how you will go about achieving it and staying with that plan.”

Similarly, though there is most often a tension between individuals, the collective is transformed into the best efforts of the individual serving the demands of the team. France’s Kylian Mbappe winning the FIFA Young Player Award makes a strong case in the point.

With this issue, we bring forth stories that illustrate the fact that success never comes easy. Setbacks are essentially the opportunities that pave the way for growth and development. Each stumbling block creates innumerable chances to rethink and refocus, potentially leading to something greater than we first imagined.

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DIGITIZATION CREATING WAVES IN **AUTOMOTIVE INDUSTRY**

That digitization is changing the face of manufacturing is the fact which industrial manufacturers are increasingly paying heed to. Assured of its pay-off, the machine tool industry has also started investing in advanced technologies to tap opportunities in the automotive industry, its biggest ally.

Digitization plays a crucial role in automotive manufacturing.



Source: Magic Wand Media Inc

The car factory of tomorrow is going to be digital. Digitization is playing an important role in automotive manufacturing. Gone are the days of yore when cars were considered to be simply a product for the end-users. Today, cars are a platform to build a new technology. Digitization is changing business models. Customers now need connected technology in their cars. The increased preference for value-added vehicles is putting pressure on automotive suppliers to cope with the demands and simultaneously keep their entities operational and profitable.

Why digitization is the buzzword

This digital revolution is not all about the consumers alone.

It is about the productivity and it is also about the annual savings which could be realized through indigenous production. Technologies such as 3D printing can increase production efficiencies. Digitization hauls up internal processes, augments efficiency and improves the overall profitability of the industry. Manufacturing industry, albeit slow in adapting to digital technologies early on, has now picked up steam with its realization of the impact that digitization will have on the value chain. Indian companies are now readily investing in these technologies to avoid huge capital investments tomorrow.

The adoption of digitization in the manufacturing process enables the industry to quickly exchange data, store large chunks

of data locally, enrich processes with digital expert knowledge, generate valuable insights from big data and facilitate communications. Manufacturing can also become more autonomous. The net result is that companies are investing in sensors, connectivity devices, software and applications such as manufacturing excellence systems.

Now is the apt time for digital factory investments due to these prominent reasons:

Technology: India is home to some of the biggest information technology (IT) companies and an established technology hub in Bangalore.

Infrastructure: A close physical proximity is required which is guaranteed in automotive hubs such as:

- Chakan in Pune which houses well-known auto companies such as Volkswagen, Daimler, Mahindra & Mahindra, Bajaj Auto, to name a few;
- Chennai in Tamil Nadu which has plants of automobile giants such as Ford Motors, BMW, Royal Enfield, Renault, Hyundai, Mitsubishi, etc.;
- NCR, Delhi which houses Maruti Suzuki, one of the oldest passenger car makers in India and which also houses the production facilities for companies such as Honda, Hero Moto Corp, Yamaha, etc.;
- Sanand in Gujarat where Tata Motors has set up its plant

and where renowned automobile majors such as AMW Motors, Maruti Suzuki, Ford, Honda and Hero Motocorp also have shops;

- Pithampur in Madhya Pradesh which houses auto giants such as Larsen & Toubro, Eicher, Volvo, Mahindra and Hindustan Motors.

Workforce: India is a country known for producing cost-effective labor with diverse skill-sets. The country also has a pool of English speaking technocrats, researchers and engineers as well.


Government support: India is an attractive place to invest in digital factories due to the amount of incentives and the ease of doing business ensured by the governments at the center and the various states.

How automotive industry will help grow machine tool industry

Automotive industry and machine tool industry enjoy a symbiotic relationship. The growth of automotive sector will drive the demand for machine tools. Over 50 percent of the machine tool industry's production is supplied to automotive industry. The steady growth in sales of commercial vehicles and passenger vehicles will bring sizeable business to machine tool industry and the industry can expect sizeable increase in orders and volumes of sales. Machine tool industry now needs to focus on technologies for producing modern machines such as precision grinding machines, multi-function and multi-axes machines, etc. to

Manufacturing industry, albeit slow in adapting to digital technologies early on, has now picked up steam with its realization of the impact that digitization will have on the value chain.

tap opportunities in the global auto market.

Machine tool industry now needs to produce machines that can understand technological language and integrate the technologies required in line with automotive industry which could enhance the technical capabilities to manufacture products for meeting today's customers' aspirations. The advent of technologies such as Internet of Things, Automation, Artificial Intelligence etc. would play a major role in enhancing productivity and quality and machine tool industry needs to quickly adopt these as part of their products to offer to the automotive industry. 

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CII highlights challenges for Indian EV manufacturers

Mumbai, Maharashtra - With the view to discuss the changing landscape of electric vehicles (EV) in India post the launch of National E-mobility program in March 2018, CII recently hosted a conference at Mumbai. The event brought forth the challenges faced by Indian EV manufacturers along with the opportunities offered by the move. It also highlighted the role of the Indian welding industry that must keep pace with the disruptions happening in the EV space.

Vishwanath Kamath, Managing Director, Fronius India was the Conference Chairman. Other speakers included Nishant Arya, Executive Director, JBM Group; DG Salpekar, General Manager - eVehicles, Energy Efficiency Services Ltd; Gerd Holzschuh, Technical Director, Fronius China; and Dr Pranati Sahoo, Advanced Application Engineer, Electronics



Source: CII
Dignitaries during the lamp lighting at the CII event on E-mobility

Material Solutions Division, 3M India. The topics covered were: Global and Indian Perspectives of the E-mobility Market; Future Trends and Challenges for Welding Fabrication for EVs; Latest Innovative Technologies for E-mobility;

The Indian EV Journey and the Way Forward; Manufacturing Automation/Integration for EV; Manufacturers in India - Future Trends and Challenges.

EMO Hannover 2019 gears up, sends out invites

Frankfurt am Main, Germany - EMO Hannover 2019 is getting ready for its upcoming appearance. The invitation and registration documents for the world's leading metalworking trade fair are currently being sent out to around 60 countries.

"We contact almost every company in the world that does international business and that has some connection with the manufacture of machine tools, tools, components, software and automation for industrial production," says Carl Martin Welcker, General Commissioner, EMO Hannover 2019.

EMO Hannover will once again be providing a platform from September 16-21, 2019, for innovative solutions, industrial applications and future technologies in the field of metalworking. Around 2,200 exhibitors are expected with half of them from outside Germany. According to the organisers, EMO exhibitors have responded well to the early bird discount, which runs until October 15 this year.



Source: VDW
Carl Martin Welcker
General Commissioner
EMO Hannover 2019



Source: Magic Wand Media
Experts from Dassault Systèmes orientating on company's 3DEXPERIENCE TWIN model for digitalizing manufacturing processes

Dassault Systèmes Focuses on Virtual and Real-time Manufacturing

Chennai, Tamil Nadu - Dassault Systèmes, the 3DEXPERIENCE company, hosted the second edition of the regional adaptation of the global megatrend event - 'Manufacturing in the Age of Experience' in Chennai. Last year, the inaugural edition of the regional event was hosted in Pune and digitalization of manufacturing was a key focus area. This year, Dassault Systèmes is geared up to further boost Indian manufacturing in their digital transformation journey with the 3DEXPERIENCE TWIN.

Whether it is a brown field or green field investment, planning from the scratch is a time-consuming affair, leading to over expenditure. 3DEXPERIENCE TWIN claims to address that - as it allows the entire planning, simulation, testing and validation in the virtual form. Samson Khaou, Managing Director India, Dassault Systèmes, said, "Our focus on the manufacturing sector is widespread complementing initiatives like 'Make in India'. We are committed to provide to our customers in the manufacturing sector comprehensive benefits through a 3DEXPERIENCE TWIN model."

Olivier Lahaye, Vice President, WW, DELMIA, Dassault Systèmes, said, "Global Companies like Cummins, Airbus, Alstom and Valeo are already benefiting by adapting 3DEXPERIENCE platform and DELMIA for digitalizing their manufacturing processes. With digital technologies businesses can drive value, meet market demands and deliver unique, one-to-one experiences for everyone and be future-ready."

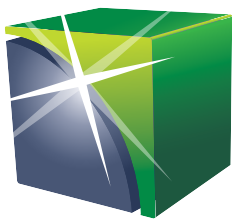
Discussing global alliances in manufacturing, Denis Georgeon, WW, VP Consulting Alliances, Dassault Systèmes, said, "The 3DEXPERIENCE platform available on premise and on cloud enables our customers to create delightful experiences for their consumers by offering end-to-end engineering, manufacturing and business capabilities. From modeling manufacturing operations to connecting the supply chain, the 3DEXPERIENCE platform offers agility and delivers digital manufacturing, manufacturing operations management and supply chain planning & optimization."



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Command over English (must), Kannada, Tamil and Hindi

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Position: **Sr. Application Engineer**

Location: **Bengaluru**

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Command over English (must), Kannada, Tamil and Hindi

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Sales & Service Engineer

Location:

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Job Description:

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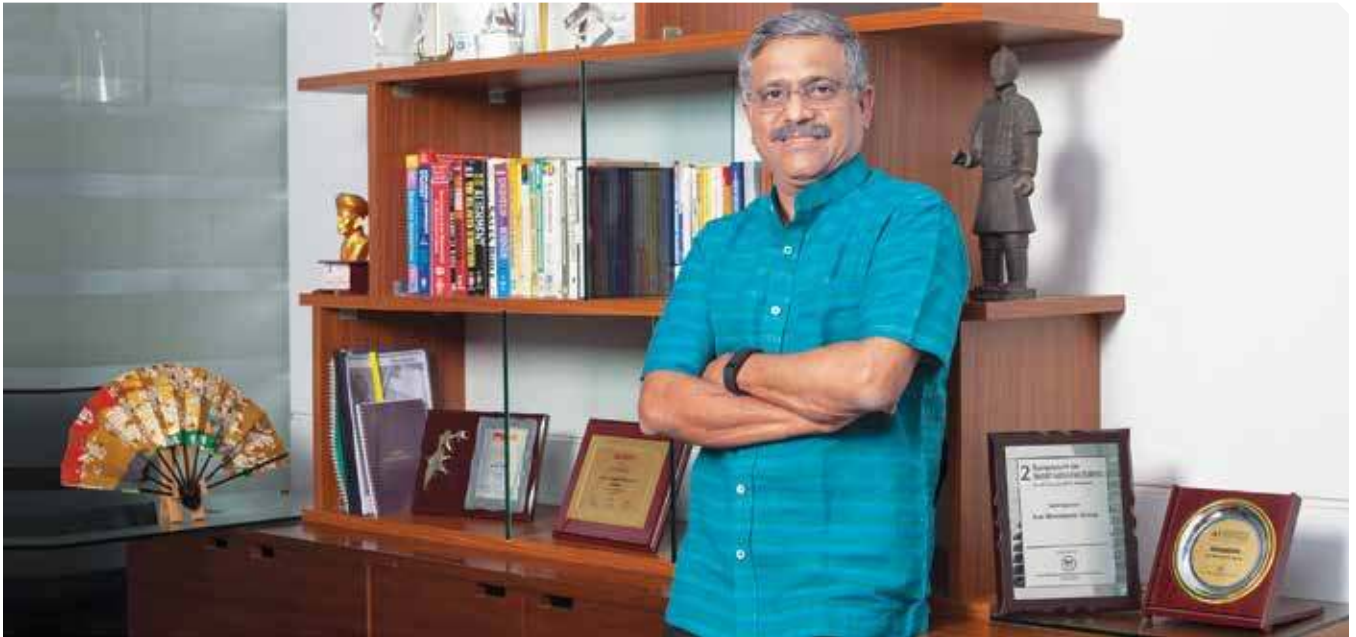
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HARNESS TECHNOLOGY TO VITALIZE AND ORIENT MARKETING

The most important responsibility of the Chief of Marketing in any organization is managing marketing profitability and delivering the best return from marketing resources. Strategies and plans must deliver current and future profits to keep the organization healthy and growing. How should then he or she manage these resources; should the CMO be driven by insight from markets and customers or by the data or by relationships?

The capability to measure and manage marketing ROI is essential but it is not easy to get. Improving the ability to measure and manage marketing ROI should be at the top of the CMO's agenda. Organizations have made efforts to find and evolve these measures but there is a lot more to be done. CMOs of organizations that are ahead in their marketing ROI capabilities reap benefits in the market place, enjoy customer preference and have better credibility with their CEOs and CFOs.

Ask yourself what you know with certainty about your own company's marketing effectiveness – and what remains unknown. Which parts of your marketing are not delivering enough results? Are you properly accounting for lifetime value? What is the best product mix? Where do enquiries leak in the opportunity funnel? The inability to answer these questions indicates untapped potential.

CMOs can now use technology to manage marketing performance and profitability. More accessible data and more advanced technologies enable sophisticated measurements and decision support. CMOs must harness the talents of their organization and drive new strategies to generate profitable growth in both the short term and long term. In a recent survey, over 35 percent of CMOs said doing more with less was their biggest hurdle. And 37 percent said integrating and tracking multiple channels was their top most challenge, highlighting measurement challenges from organization silos. The time is right to invest in technology to close the gaps and enable the marketing department to make better informed decisions aligned to business outcomes.

The time is right to invest in technology to close the gaps and enable the marketing department to make better informed decisions aligned to business outcomes.

T K RAMESH
Whole time Director and CEO
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The views expressed by the author are personal and he can be contacted at rameshtkr@gmail.com

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HEADING IN THE RIGHT DIRECTION

It is imperative for the machine tool segment to be extremely strong for the auto industry to achieve a high level of excellence. Working towards it, the former has started embracing advanced production technologies to pass on the benefits to the auto sector, its mainstay and partner in growth.

The fourth industrial revolution has ushered in technologies that are redefining the manufacturing ways. As the new and emerging technologies such as the industrial internet of things, advanced robotics, artificial intelligence and additive manufacturing are unfolding their impact on the manufacturing processes, manufacturers are increasingly making aggressive moves to adopt them

in their pursuit of enhanced efficiency and productivity gains. The trend can majorly be observed in the country's key automotive sector, which is undergoing a transformative change in the process of catering to its end users' demands that include greater connectivity and innovative solutions for safety, ease of use, and infotainment. Environmental regulatory norms and cost-competitiveness are oth-

er key factors compelling auto manufacturers to resort to these breakthrough technologies. "In India, disruptive concepts like IoT and Industry 4.0 are still at a nascent stage. However, with a connected world, sooner rather than later, this revolution will be staring at us in the face," says Nirmal Minda, President, Automotive Component Manufacturers Association of India (ACMA). The Indian auto sector is wit-

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Source: ACMA

“In India, disruptive concepts like IoT and Industry 4.0 are still at a nascent stage. However, with a connected world, sooner rather than later, this revolution will be staring at us in the face.”

Nirmal K Minda
President
Automotive Component
Manufacturers Association of India
(ACMA)

ness to a phenomenal growth. There have never been such myriad options in the models of cars, bikes and commercial vehicles launched by auto companies. Along with being a major consumer of automobiles, India is also a major exporter of auto components to many countries, which is another factor for the growth of the Indian automotive industry and component manufacturing industry.

A fillip to the machine tool sector

The machine tool industry and the automotive industry have always been working hand in glove with each other. Since



Source: Bharat Fritz Werner Ltd

“Companies are moving from mass production to smaller lot multi-model manufacturing. There is a great focus on technology-driven productivity and this excites us because we have been developing this aspect as a strength.”

Ravi Raghavan
CEO
Bharat Fritz Werner Ltd (BFW)

over 50 percent of the Indian machine tool industry’s production gets supplied to the country’s automotive segment alone, the latter primarily drives the machine tools’ growth. As the machine tool industry continues making progress and heads towards sophisticated CNC machines, it must also acknowledge the demands being made by its major user segment which primarily comprise technological upgradation.

“We are living in exciting times. There are innovative solutions getting developed for the new challenges in India and other parts of the globe. Companies are adopting newer technolo-

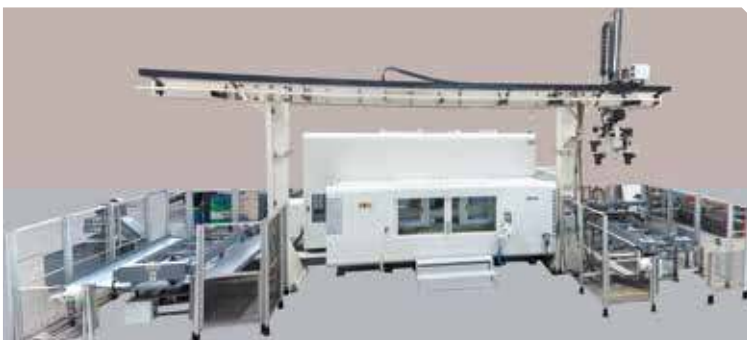
gies not only in machines, but also in the entire manufacturing ecosystem to enhance productivity,” says Ravi Raghavan, CEO, Bharat Fritz Werner Ltd, pointing to the work in progress.

Auto players upping their game

The machine tool manufacturers are closely observing this digital shift in the auto sector since they are the ones who will have to ensure that the machine tools are modernized to serve the auto companies with the machines that they require. “Companies are moving from mass production to smaller lot multi-model manufacturing. There is a great focus on technology driven productivity and this excites us because we have been developing this aspect as a strength for some time now,” shares Raghavan.

Ajinkya Huddar, CEO & Managing Director, Pelf Infotech Pvt Ltd, notes, “Conventional manufacturing system calls for a close-knit combination of CAD-CAM that encapsulates design setup, moulding, tooling and allied pre-requisites, whereas Industry 4.0 emphasizes predominantly on smart manufacturing techniques like Additive Manufacturing (3D Printing) using smarter and non-conventional material like composites in addition to plastic and metal that can really reap dividend in the long term. The global auto sector has started leveraging the benefits of 3D Printing for mainstream production. Although its adoption is not as aggressive in India, but the auto companies and the ancillaries have started following their global peers,” he adds. Since most Indian auto manufacturers are working on electrifying their products, the economy is likely to see a shift from being a combustion-driven market to a battery and cell-driven one, re-

As the emerging technologies are unfolding their impact on the manufacturing processes, manufacturers are increasingly making aggressive moves to adopt them in their pursuit of enhanced efficiency and productivity gains.



Source: Bharat Fritz Werner Ltd

The Front Axle Beam machine launched by BFW is an import substitute for the growing demands of the commercial vehicle manufacturers.

The transition to adapt to the new industry environment will also bring forth issues such as data protection and security, knowledge about proprietary production, high degree of reliability and stability, which is required for successful cyber-physical communication.

marks Umesh L, CEO, Ace Manufacturing Systems Ltd (AMS). "Another change is the large extent of work that is being done in automating the entire value chain including real-time material planning, resource allocation, and production technology. Various IoT solutions are being deployed by automotive industries in enhancing their production processes," he adds. According to Punit Gupta, Managing Director, Blaser Swisslube India Pvt Ltd, Change Management has become a key task due to faster changes coming in technologies from multiple directions and dimensions. Simple to complex digitization is creating a huge impact on manufacturing, with industry learning to be more agile. New technologies have also enabled people's efforts to be environmentally-conscious.

Machine tool players going all out

The machine tool players of the country are doing their best, chipping in with their productivity enhancing solutions and ensuring that the auto companies get an equal competitive edge as their global peers. To support its auto customers, BFW has started manufacturing intelligent machines and moving towards smart manufacturing. "We have successfully developed an IoT platform, IRIS, to address these needs. We have installed IRIS in some of our machines delivered to a number of corporate clients and this will be part of all our new machines," informs Raghavan. IRIS is an offering that spans wide beyond the auto sector and adds a breakthrough dimension in terms of productivity solutions from machine tool companies. He then elaborates on what he calls BFW's strength, which are solutions which have the most



Source: Blaser Swisslube India Pvt Ltd

"Change Management has become a key task due to faster changes coming in technologies from multiple directions and dimensions. Simple to complex digitization is creating a huge impact on manufacturing, with industry learning to be more agile."

Punit Gupta
Managing Director
Blaser Swisslube India Pvt Ltd

complex mix of special purpose and standard machines, "We have launched the Front Axle Beam machine, an import substitute, for the growing demands of the commercial vehicle manufacturers. This machine is completely automated which handles heavy forged components with safety and in a single setup." Blaser's Liquid Tool approach has led to its customers in the auto sector achieve cut time reductions in the range of 5 to 15 percent, and tool cost reductions in the range of 20 to 40 percent. "We did more than 200 projects last year in India wherein we could document the positive impact of Liquid Tool in increased competitiveness and productivity," says Gupta.



Source: Blaser Swisslube India Pvt Ltd

Blaser's Liquid Tool approach facilitates its auto sector customers to achieve remarkable cut time and tool cost reductions.



Source: Ace Manufacturing Systems Ltd

"Since most Indian auto manufacturers are working on electrifying their products, the economy is likely to see a shift from being a combustion-driven market to a battery and cell-driven one."

Umesh LS
CEO
Ace Manufacturing Systems Ltd

Huddar shares Pelf's product portfolio, "We have been catering to a plethora of industry verticals from Automotive to Aerospace to Product Development to Defence to Medical Electronics etc. for the last two decades with our wide range of products including CAD, CAM, CAE, CFD, CAI, Reverse Engineering, and Additive Manufacturing based on end-user requirements." It's been 25 years for AMS to be one of the preferred machine tool builders for most of the auto OEMs and auto component manufacturers. "We provide various productivity enhancing solutions such as large capacity tool changers with sister tool programming features, automatic pallet changers to minimize the



Source: Ace Manufacturing Systems Ltd

AMS' Gemini XL is highly sought after by auto makers.



Source: Pelf Infotech Pvt Ltd

“The global auto sector has started leveraging the benefits of 3D Printing for mainstream production. Although its adoption is not as aggressive in India, but the auto companies and the ancillaries have started following their global peers.”

Ajinkya Huddar
CEO & Managing Director
Pelf Infotech Pvt Ltd

component load unload times, index tables and rotary tables to reduce the number of setups in machining, software features for tool life monitoring, in-process measurement and corrections for certain specific critical applications etc.” says Umesh. The company has also developed certain special products specifically for the high-volume automotive market such as the twin spindle machining centers in different tool sizes and strokes suiting the applications. AMS also offers automation solutions to further enhance the productivity of the process by reducing the human intervention and allowing the machines to work during breaks.



Source: Pelf Infotech Pvt Ltd

Markforged X7 Industrial series 3D printer from Pelf



Source: Jyoti CNC Automation Ltd

“We have served many customers from the auto sector with complete tooled-up solutions to turnkey projects, and our aim is to keep enhancing our solutions depending on the needs of our customers, rather than offering vanilla machines to all.”

Himanshu P Shaparia
Vice President - Sales
Jyoti CNC Automation Ltd

Jyoti CNC offers total solutions coupled with automation with its products to suit individual needs. “We have served many customers from the auto sector with complete tooled-up solutions to turnkey projects, and our aim is to keep enhancing our solutions depending on the needs of our customers, rather than offering vanilla machines to all,” shares Himanshu P Shaparia, Vice President - Sales, Jyoti CNC Automation Ltd.

Challenges on the way

Apart from access to and deployment of requisite affordable technologies, one of the major challenges, Minda foresees, is that of building a skilled work-




Source: Jyoti CNC Automation Ltd

Jyoti CNC's Tachyon 7 from Tachyon series is for the fastest drilling and tapping applications in the auto sector.

As the machine tool industry continues making progress and heads towards sophisticated CNC machines, it must also acknowledge the demands being made by its major user segment which primarily comprise technological upgradation.

force that will allow the change to succeed. “The transition to adapt to the new industry environment will also bring forth issues such as data protection and security, knowledge about proprietary production, high degree of reliability and stability, which is required for successful cyber-physical communication. Moreover, avoiding technical problems that could cause expensive production outages will need to be addressed,” he adds. Gupta puts forth his view, “Competitiveness will challenge the manufacturers more due to the complexity emerging in the global world either due to a protectionism trend or new emerging technologies which are disruptive or innovative.” He stresses on a holistic approach which he feels would be extremely important and interesting to drive the competitiveness and productivity.

Optimism abounds

It's the nature of science to always be advancing. Technologies evolve and get advanced simply to improve processes and products. With some challenges, the advanced production technologies of today promise much more opportunities. “With the introduction of these new technologies, new skill sets would be required in the field of design, operations as well as other elements of the auto value chain in the next few years. Low-skilled labour jobs which mostly include repetitive routine job such as painting, welding etc. will give way to higher skills such as supervising, designing, robotics, programming and maintenance etc. Enabling and equipping the workforce with appropriate skills will further increase their efficiency with the added benefit of increased revenues, market share and profits,” sums up Minda pointing to a brighter tomorrow. 

LEADING BY EXAMPLE

As the recently appointed Director of Central Manufacturing Technology Institute (CMTI), an autonomous R&D Institute under Department of Heavy Industry, Ministry of Heavy Industries & Public Enterprises, Dr Nagahanumaiah has some plans laid out to take the institute up a notch. The new leader shares them and his take on the machine tools industry in this earnest interview with the team MMI. Excerpts:



Dr Nagahanumaiah
Director
CMTI

Industry 4.0 and emerging technologies such as the IoT, artificial intelligence, robotics and additive manufacturing are spurring the development of new production techniques and business models that will fundamentally transform production. How is the adoption of these trends by the Indian industry?

Dr Nagahanumaiah: Industry 4.0 (I4.0) technologies imply paradigm shifts in all aspects of manufacturing through digitization, automation and integration. Instead of looking at I4.0 as

a threat, Indian Industries need to see them as business enablers and opportunities.

Manufacturing companies can benefit by becoming 'smarter' with early prediction of risks, sharing digitized data across the process chain, and integrating advanced and improved manufacturing systems - leading to enhanced value and productivity. However, I strongly advocate achieving a critical level of customization prior to adopting disruptive technologies because technology absorption largely depends on human resources.

Ironically, in spite of our large population, attracting and retaining skilled manpower is becoming a major issue for most of our companies. Realizing these challenges, various arms of the government are emphasizing and supporting technical skill development through Demonstration Centers.

What, according to you, are the prime headwinds in the adoption?

Dr Nagahanumaiah: One of the major headwinds in the adoption of I4.0 technologies in India is the mindset of industries, which is due to a number of uncertainties. These include:

- » **Skilled manpower:** Availability of the right manpower is still a big issue. Retaining them is another challenge.
- » **Low level of technology maturity:** Since many disruptive technologies are being developed in parallel, their maturity level is low and their sustainability over a period is short. This calls for additional investments in future.
- » **High operational and MOR cost:** Recurring cost is expected to be quite high owing to limited resources and proprietary technologies including consumables and spares.
- » **Cost vs. benefits:** As of yet, there is no established and demonstrated cost benefit analysis. One of the biggest

questions in the minds of investors is whether I4.0 technologies will bring added market. If yes, will it be same for all sectors.

How well positioned is India to shape and benefit from the changing nature of production in the future?

Dr Nagahanumaiah: The availability of a huge base of engineering and science graduates makes it easier to introduce I4.0 technologies in Indian industries. However, most Indian companies are small-scale industries with limited resources to attract and retain top-end manpower. Further, companies will invest in disruptive technologies only if they are convinced about the outputs and benefits through demonstration. From the point of view of industry, particularly MSMEs, ensuring the supply chain of I4.0 technologies appropriate to the specific sectors, along with local technical support, would decide the rate of adoption. That is the reason industrial associations across sectors are looking for Demonstration Centers and Centers of Excellence rather than implementing I4.0 technologies in their business units right away.

CMTI has been playing a significant role of being a catalyst in manufacturing technology growth in the country. Under your able guidance as the Director of the institute, how do you envision its growth?

Dr Nagahanumaiah: CMTI over years has evolved as a Center of Excellence for Machine Tool and Manufacturing Process Development. As the head of this renowned institute, I look forward to the challenge of bringing together knowledge-creators (Saraswati) and wealth-creators (Lakshmi) for



Source: CMTI


“As the head of this renowned institute, I look forward to the challenge of bringing together knowledge-creators (Saraswati) and wealth-creators (Lakshmi) for mutual benefit as well as social impact.”

Dr Nagahanumaiah
Director
Central Manufacturing
Technology Institute (CMTI)

mutual benefit as well as social impact. It implies development of technology-intensive products, machines and processes, and licensing them to industry partners. With proven credentials in developing and productionizing a wide range of special purpose machines, CMTI is poised to become a Center of Excellence for Smart Manufacturing and Innovative Product Development. Smarter, modular and reconfigurable machine tools and their aggregates (subsystems) for both subtractive and additive manufacturing will be one of our major R&D focus, keeping in mind emerging technologies and long-term sustainability. CMTI will also continue and enhance its value-added (laboratory) services to industry, as well as training of technical professionals to make them readily employable in industry or entrepreneurs creating new jobs for others.

The Heavy Industries and Public Enterprises Ministry is supporting setting up of four centers in the country to facilitate SMEs implement Industry 4.0 of which one will be in CMTI, Bengaluru. Could you tell us about the fashion in which the centers plan to spread the awareness on Smart Manufacturing Technologies?

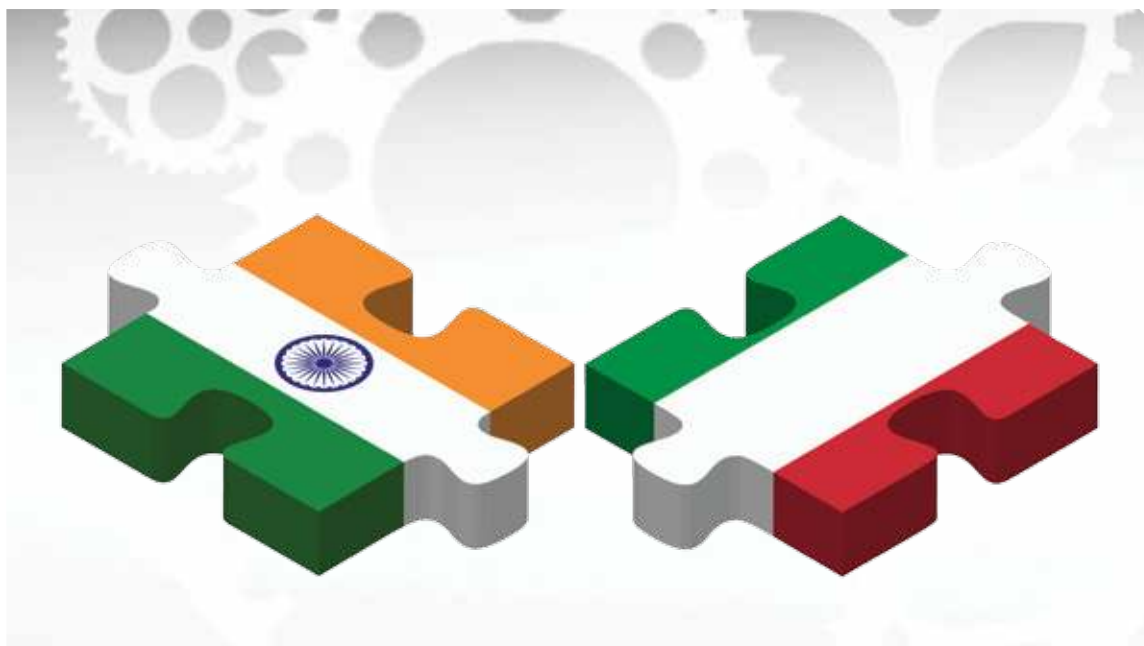
Dr Nagahanumaiah: As mentioned earlier, Indian companies, particularly SMEs, look for well-demonstrated manufacturing technologies to de-risk their investments. This is one of the reasons our parent department HE&PE is establishing four centers to empower SMEs toward implementing I4.0 technologies for the benefit of Capital Goods sector. In our center at CMTI, we have two objectives. The first is demonstrating the concept of Smart Manufacturing - Factories of Future, which would provide an opportunity for MSMEs to touch and feel the benefits of the concept as well as use this center to cost-effectively train their manpower. The second and rather more important objective is to indigenously design and develop IoT-enabled smart manufacturing machines and systems to demonstrate the capabilities in real shop-floor environment.

We strongly believe in Active Learning, driven by a quote by philosopher Confucius: “I hear and I forget. I see and I remember. I do and I understand”. CMTI is committed to enhance our competence in the complete process chain of I4.0, including process prediction, digitization and data sharing, process analytics, and development of smart machines based on modular designs. In this initiative, we are already associated with IMTMA, that would play a pivotal role in analyzing and defining the need of Indian machine tool industries. I believe the other three centers are also treading a similar path. 

Companies invest in disruptive technologies only if they are convinced about the output and benefits through demonstration. Hence, industrial associations across sectors look for Demonstration Centers and Centers of Excellence.

INDIA-ITALY: HAND IN HAND INTO THE FUTURE

India and Italy are taking note of each other's strengths and realizing the opportunities that lay in strengthening the bilateral trade between the two nations. An account of how far the duo have got in this endeavor towards progress and what's the plan ahead...



Source: Magic Wand Media Inc

The current global economic scenario calls for forging economic relations between nations. Taking stock of the opportunities such alliances offer such as advantages of cost, economies of scale, and employment, India, with its newly formulated economic policies, is striving hard to improve its bilateral ties with major economies. Working in alignment with its plans, the country last year inked six pacts with Italy, the world's ninth biggest economy, to boost cooperation in key sectors, includ-

ing energy and trade, after detailed talks between Prime Minister Narendra Modi and his Italian counterpart Paolo Gentiloni.

Italy's machine tool sector upbeat this year too

Italy is India's fifth largest trading partner in the EU with a bilateral trade of US\$8.79 billion in 2016-17, as per official figures. The country's economic structure is mainly based on services and manufacturing. Its manufacturing sector is specialized in high-quality goods, and its main

exports are mechanical machinery and equipment as well as motor vehicles and luxury vehicles.

As per the country's machine tools sector, Massimo Carboniero, President of UCIMU-SISTEMI PER PRODURRE, Italian Machine Tools, Robots & Automation Manufacturers Association, briefs us with its buoyant situation: "2017 was quite a positive year for the Italian industry for manufacturing machine tools, robots and automation systems, totalling a turnover of over

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Source: UCIMU

“We closed a really positive 2017 and the year 2018 should be just as favourable. As highlighted by the forecasts and by the latest data concerning the index of orders, both the foreign and the domestic markets are giving satisfactory results to the Italian enterprises of the sector.”

Massimo Carboniero
President
UCIMU-SISTEMI PER PRODURRE
Italian Machine Tools Robots &
Automation Manufacturers
Association

€ 9 billion, highlighting an upturn for all main economic indicators.” “Ranking fourth among manufacturers, Italy confirmed its third position among exporters; in addition, it stabilized its fifth place in the consumption ranking,” he informs. The second quarter of 2018 continued the positive trend with the index of machine tool orders growing by 2.8 percent compared with the same period of the previous year.

How Italy perceives Indian market

According to Dr Francesco Pensabene, Trade Commissioner & Director, Trade Promotion Section, Italian Embassy in New Delhi; & Coordinator of Trade Offices Network in India, Nepal, Bhutan, Sri Lanka, Maldives and Bangladesh, Indian market has a significant potential offering prospects of high profitability and favorable regulatory regime for investors which makes it a most sought after investment destination. “India has definitely



Source: IITA

“India’s large population of highly educated youth and numerous raw materials, and Italy’s technological and design expertise, along with a world-renowned acumen to transform things, make us a perfect match for trade and investments.”

Dr Francesco Pensabene
Trade Commissioner/Director
Trade Promotion Section of the
Italian Embassy in New Delhi &
Coordinator of Trade Offices
Network in India, Nepal, Bhutan,
Sri Lanka, Maldives, Bangladesh


been an attractive destination for global investments. It is commendable that the country from being ranked at 142 in 2014, 130 in 2015 and 2016, has recently jumped to 100 in the Ease of Doing Business (EODB) ranking, as FDI in the country grew considerably in this period,” he adds. As per the data available for the financial year 2017-18, proceeds Pensabene, India received FDI inflows of more than US \$44.8 billion, registering a growth of 3 percent, whereas the FDI inflows for the previous financial year 2016-17 were more than US \$43.4 billion, which was 9 percent more than the previous financial year 2015-16. “Italy is the 16th largest investor in India, having a share of 0.69 percent,” he shares.

Staying true to its job, Pensabene knows which Indian sectors have attracted FDIs: “In terms of percentage, top sectors that attracted investments during the period April 2000 – March 2018 are: services (17.56 per-

cent), computer software and hardware (8.18 percent), telecommunications (8.0 percent), construction (6.59 percent), automobile (4.98 percent), trading (4.92 percent), food processing (2.24 percent) and industrial machinery (1.29 percent).

Growing in collaboration

India and Italy have taken to each other as natural partners. Italy has been actively contributing to the “Make in India” movement with its manufacturing know-how and expertise. “Almost 43 percent of Italian exports to India include machine tools, woodworking machines, textile machines, marble and stone machines etc.,” he informs. Intensive promotional programs carried by the Trade Commission of the Italian Embassy in New Delhi, throughout India, have paved the way for new successful and joint initiatives. “Our experience here reinstates the fact that Indo-Italian bilateral trade and investment relations would be built by complementing strengths and skills in key areas. India’s large population of highly educated youth and numerous raw materials, and Italy’s technological and design expertise, along with a world-renowned acumen to transform things, make us a perfect match for trade and investments,” notes Pensabene.

There are more than 400 Italian companies present in India. Major locations of presence include city-clusters of Delhi-Gurgaon-Noida, Mumbai-Pune, Chennai and Bangalore. In addition to this, Italian companies are also exploring newer locations for Italian plants in India such as states of Gujarat and Rajasthan. In fact, machinery accounts for almost 4.5 percent of the total Italian investments made in India which will surely increase in the years to come given the competence of Italy in the sector. 

Machinery accounts for almost 4.5 percent of the total Italian investments made in India which will surely increase in the years to come given the competence of Italy in the sector.

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IMTS 2018: THE FUTURE OF MANUFACTURING

The 32nd edition of the International Manufacturing Technology Show (IMTS), the largest manufacturing technology show in the Americas, organized by the Association for Manufacturing Technology (AMT) is being held on September 10-15, 2018 at McCormick Place, Chicago, IL to once again showcase the best and the latest innovations from the ever-evolving manufacturing ecosystem. A sneak peek...

A Collaborative Robot displayed at a previous IMTS.



Source: AMT

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The premier manufacturing technology show in North America, the International Manufacturing Technology Show (IMTS), has carved out a reputation for itself as a no-miss affair of the manufacturing industry. It's been 90 years but the show till date continues to lure the largest number of participants, a testimony to its impact on their businesses.

IMTS, held every even year in Chicago, attracts buyers and sellers from 117 countries. Introducing the latest advancements in manufacturing technology, the show has been significantly instrumental in the success of many a machine shop and manufacturing facility, helping them be innovative and competitive. The last edition, IMTS 2016, hosted the highest number of ex-

hibiting companies ever (2,407) and was the third largest in the number of registrations (115,612) within its 1.37 million sq ft of floor space at the McCormick Place complex.

IMTS 2018 Pavilions

More than 2,400 exhibitors from the metalworking industry will display their products and productivity solutions at IMTS 2018.

Source: Marshall Machines Ltd



“We can leverage our success at IMTS to bolster our image in the Indian market. The show is a great opportunity to widen our knowledge especially in the domain of IIoT and Industry 4.0.”

Gaurav Sarup
Managing Director
Marshall Machines Ltd

Hall: East Building, Level Two
Booth: 121474

To help guide attendees to booths quickly and easily, the event has arranged exhibits in Pavilions that are geared toward specific industries, technologies and solutions. With such categorization, it seems like 10 shows within the IMTS show.

There is a specific pavilion for the following: Abrasive Machining / Sawing / Finishing; Additive Manufacturing; Controls & CAD-CAM; EDM; Fabricating & Lasers; Gear Generation; Machine Components / Cleaning / Environmental; Metal Cutting; Quality Assurance; Tooling & Workholding Systems.

Co-located shows

Displaying a complete range of manufacturing technology solutions, IMTS 2018 makes for manufacturing’s most comprehensive event. The event hosts four co-located shows that complement the metalworking solutions exhibited.

The two leading trade fairs Industrial Automation and MDA are getting combined to create a new annual event: **Integrated Automation, Motion & Drives (IAMD) USA** at IMTS 2018. The

Source: KG Bearing Pvt Ltd



“We are expecting a good footfall at our booth at IMTS 2018. We look forward to meeting genuine people who are interested in our products and helping them with our solutions.”

Avinash Khosla
Managing Director
KG Bearing Pvt Ltd

Hall: East Building 1, Level 3
Booth: 135354

event will present the complete spectrum of industrial automation, IT, power transmission and fluid power technology.

Surface Technology USA will cover the entire range of industrial surface treatment and finishing - from cleaning and pre-treatment to coatings, paint finishes, and electroplating.

ComVac USA will highlight the latest product developments, technology, and plant & system components for all areas of compressed air and vacuum.

Industrial Supply USA will cover the entire spectrum of industrial subcontracting and light-weight construction.

IMTS Conference

Several educational sessions are lined up during the week of IMTS. The largest and longest running of these is the IMTS Conference from September 10 - 13, 2018, jointly produced by AMT and GIE Media. The conference is a platform for the manufacturing fraternity from world over to gather under one roof. It is an ideal opportunity to explore innovative ideas and gain fresh perspectives to

Source: HMB International



“We look at the US market as extremely mature when it comes to sourcing products from this side of the world. However, we feel that there is certain level of acceptance for the ‘Made in India’ brand.”

Manan Chowdhry
Technical Director
HMB International

Hall: West Building Level 3,
Tooling & Workholding Systems
Booth: 431348

overcome the various challenges manufacturers encounter. The four-day technical conference features more than 70 sessions, attended by over 1,500 IMTS visitors. All sessions will be presented by subject matter experts from within the IMTS exhibitor community.

They fall into these main categories:

- Manufacturing Process Innovations
- Alternative/Additive Manufacturing
- Plant Operations
- Quality/Inspection/Metrology
- Systems Integration/ Industry 4.0/IIoT

Co-Located conferences at IMTS

In addition to the IMTS Conference, there are several other important presentations that are held during the week of the show, presented by leading manufacturing thought-leaders.

These events include:

Additive Manufacturing Conference - by Gardner Business Media

More than 2,400 exhibitors from the metalworking industry will display their products and productivity solutions at IMTS 2018.

AppliedAM - Where Additive Minds Meet - by EOS North America

GAMS (Global Automation Manufacturing Summit) - by HANNOVER MESSE USA

OPC Foundastion Conference - by HANNOVER MESSE USA

Integrated Industries - by HANNOVER MESSE USA

Industrial Laser Conference - by Laser Institute of America

Top Shops Workshop - by Gardner Business Media/ Modern Machine Shop

Indian participation at IMTS 2018

With IMTS being one of the biggest manufacturing technology shows in the world, there is a significant enthusiasm among the Indian players to explore opportunities at the event and broaden the reach of Indian products.

"We look at the US markets as extremely mature when it comes to sourcing products from this side of the world. However, we feel that there is certain level of acceptance for the 'Made in India' brand," says Manan Chowdhry, Technical Director, **HMB International**.

The company is all geared up to showcase its VAICO range of tools along with its new series of through coolant tools to American consumers. "VAICO itself is something new as far the American consumers are concerned. We are bringing the highest quality tools in the world at prices half of what the average American factory owners and tool supply companies are used to," informs Chowdhry. "Our major focus would be on cutting tool supply companies for representing us in the US, Canada and South America; companies that work with their customers not only as suppliers, but also as applications advisors," he adds.

KG Bearing Pvt Ltd is a leading manufacturer of bearings. "We are expecting a good footfall at IMTS 2018. We look forward to meeting genuine people who are interested in our products and helping them with our solutions," says Avinash Khosla, Managing Director, KG Bearing. The company will be showcasing its pillow block units, deep groove ball bearings, spherical roller bearings etc. which are used in various industry sectors such as Machine Tools, Agriculture,

Mining & Quarry, Oil & Gas, Pulp & Paper, Pumps & Motors, Steel Mill, Transmission, Wind Energy & Conveyor Systems.


According to Gaurav Sarup, Managing Director, **Marshall Machines Ltd**, IMTS 2018 is just the right platform for the company to showcase its unique IoTQ (Internet of Things for Quality) technologies to a large number of its prospective customers.

"The event will help us connect with our indirect customers i.e. OEM and tier 1 companies whose vendors use CNC Turning Centers. By convincing these companies that our IoTQ technology will enable their vendors to produce zero-defect quality, we can use their assistance in reaching out to our direct customers i.e. their vendors," he adds.

The company will be showcasing its three technologies in two products. "Our Super-precision CNC Turning Center ALTIUS will be used to showcase TWO technologies: Precision Hard Turning to eliminate Grinding; and Industry 4.0 features to monitor health and performance of a machine and take 'autonomous corrective action,'" shares Sarup.

The company's Gauging Stations will showcase the three IoTQ technologies: *SmartCorrect* for Zero Defect production; *SmartInsert* for Optimization of Tool Insert Life and *SmartChek* for Automated Health Check of a machine to prevent unexpected breakdowns.

Leading the way

Showcasing the state-of-the-art manufacturing solutions and technologies, the event has been guiding the manufacturing industry round the globe to be equipped with the best to cater to the future demands. IMTS 2018 is all geared up to continue the tradition and showing the industry the way that leads to innovation and growth. 

In addition to the IMTS Conference, several other important technical sessions are held by leading manufacturing thought leaders during the week of the show.

IMTS visitors marveling at a 3D manufactured product.



Source: AMT



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FLEX TURN-Neo TWIN



TYPICAL EXAMPLE

COMPONENT NAME : HEAT SINK

MATERIAL: ALUMINIUM

SPINDLE : A2- 5 : 165 X 3 JAW CHUCK

Sl. No	Machine	Machining Time	Load/ Unload Time	Total	Remarks
Op1	LEANTURN	33 Sec	15 Sec	48 Sec	2 Operators
Op2	LEANTURN	24 Sec	15 Sec	39 Sec	
Op1	FLEXTURN-TWIN	33 SEC	NIL	33 Sec	1 Operator
Op2	FLEXTURN-TWIN	24 SEC	NIL	24 Sec	

TOTAL TIME PER PIECE - 57 SEC

One component produced in 57 seconds on one Flex Turn Twin with one operator as against one component in 48 seconds with two operators in two machines. (Only for comparison purpose and linear tooling machine is considered)

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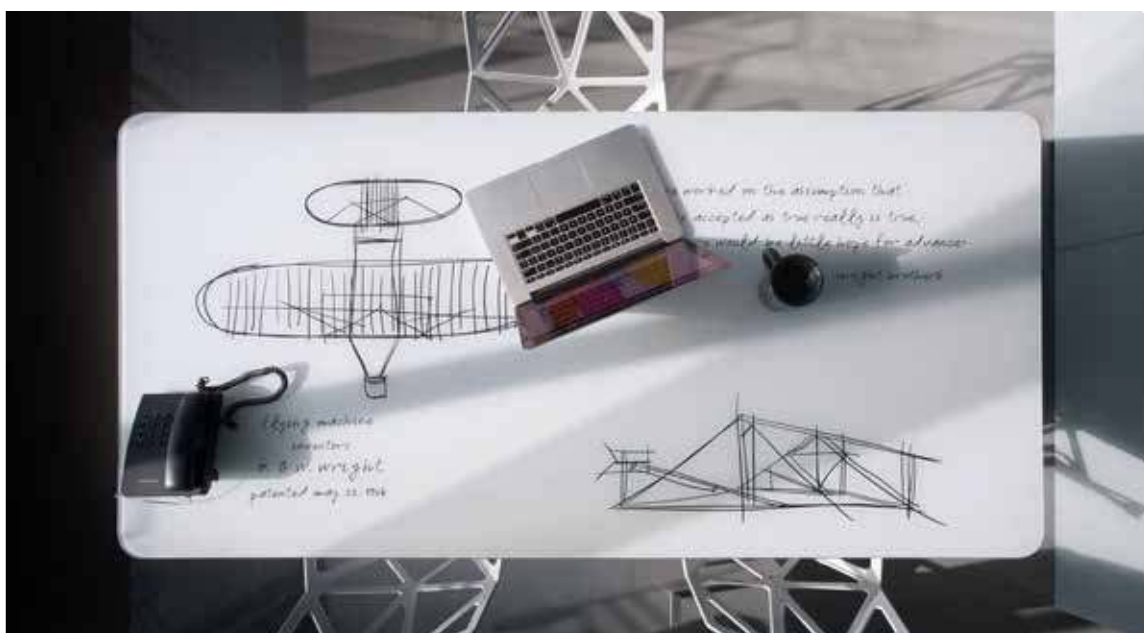
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REALIZING THE IMPOSSIBLE

For over a decade, Imaginarium has been striving to transform the face of Indian manufacturing with the aid of additive manufacturing, also called as 3D printing. To successfully meet its customers' diverse needs, India's largest rapid prototyping and rapid manufacturing center has been delving in novel ways to turn ideas into shapes considered impossible until now. Here's its journey so far and what has taken it to emerge as a winner...



Source: Imaginarium India Pvt Ltd

Imaginarium has now grown into a platform for ideas to be brought to life.

It's not been very long since Additive Manufacturing started garnering attention in India as a manufacturing technology. Imaginarium India Pvt Ltd tops the list of the few in the country who could fathom its potential at the right time. The company has been poring over it since then, making some serious investments in the lesser known technology with the aim to make it accessible to more companies and taking the industry by storm.

Taking the untrodden path
Imaginarium has been at the forefront of the 3D Printing

and Additive Manufacturing wave in India for over a decade now. The company started off as a service bureau with a small footprint in the Jewelry industry, slowly expanding to sectors such as Automotive, Engineering, Electronics, Dental etc. The next phase was an evolution towards application expertise. "As application experts, we added allied technologies such as metal casting, vacuum casting, CNC machining, injection moulding, painting, plating etc. that helped fabricate completely functional prototypes and small batches of end use products for several industries,"

shares Nishant Shah, Director, Imaginarium India.

"Imaginarium is a now one-stop-shop for anyone who wishes to realize product ideas and needs support through any means – networking with relevant providers, manufacturing services, technology consultancy, knowledge and education or financial support," he adds.

"The Awareness Stage of this new technology is at its end, and with all the major players starting to adopt 3D Printing within their organizations, the exciting developments and opportunities ahead is what keeps us ticking," says the jubilant Shah.

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Catering to a wide spectrum of industries

There are several industries vying for the top spot in terms of demand for 3D Printing, and the Automotive, Jewelry and FMCG sectors have all been growing fast. "The trend is towards the use of 3D Printing for end part manufacturing rather than just as a way to prototype new ideas," notes Shah.

The business units of Imaginarium are set up around specific industry groups that it serves.

Imaginarium Rapid is the team that addresses the needs of Engineering, Automotive, Electronics, Aerospace and other related sectors for all kinds of Rapid Prototyping, Rapid Manufacturing and Product Development related jobs.

Imaginarium Precious is an on-demand, low volume manufacturing facility for all kinds of metal products such as jewelry, accessories and gift articles using 3D Printing.

Imaginarium Life brings life-saving technologies to doctors, surgeons and hospitals all over the country. 3D Printing allows completely new ways of health-care by means of patient-specific anatomical models, surgical guides, implants as well as prosthetics and orthotics.

Imaginarium Solutions is a team of technology experts who has partnered with global giants such as HP, Autodesk, Oerlikon, Rapidshape and others to bring the best in class products to the Indian market, including Machines, Materials and Software for 3D Printing.

Filling the gaps

With Additive Manufacturing and Digital Fabrication being emerging technologies, getting skilled personnel has been a huge challenge for Imaginarium. With the view to fill in large gaps in the education curricu-



Source: Imaginarium India Pvt Ltd

"The Awareness Stage of this new technology is at its end, and with all the major players starting to adopt 3D Printing within their organizations, the exciting developments and opportunities ahead is what keeps us ticking."

Nishant Shah
Director
Imaginarium India Pvt Ltd

lum with regards to Additive Manufacturing coverage, the company has set up the Imaginarium Academy. "The Academy's sole purpose is to find new ways to communicate the power of 3D Printing to as many audiences as possible," shares Shah. It has been able to reach out to diverse crowds that span schools, colleges, professionals and large organizations making them aware of the benefits of 3D Printing.

"Over time, initiatives like the Imaginarium Academy as well as new courses being offered at universities in India and abroad have led to an increased influx of candidates with relevant training and work experience, though there is still room for many more as the industry demands increase," he adds.


Realizing that new technologies

can often be intimidating for non-technical students/professionals, Imaginarium has resorted to creative ways such as the Metamorphosis Café to lower the learning curve and increase accessibility to such technology. "The Metamorphosis Café is a customized 3D Printing Experience Zone that can be set up in any institute or organization and comes bundled with easy-to-use 3D Printers, Scanners, Material, Software and Content. Think of it as a plug and play innovation corner wherever you want it!," he notes.

Advantage Imaginarium

Shah tells us about the various benefits to customers while they avail of Imaginarium's services: "We are in a very fast paced industry. Imaginarium has always tried to understand the need of the customer at the very beginning of the quotation stage itself. This, in turn, helps delays in requirement understanding and process understandings. This reduces time and hence some cost."

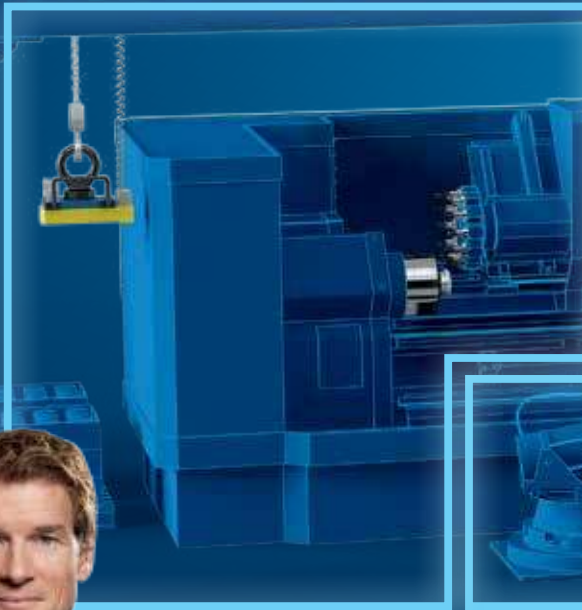
Additionally, the company is rapidly increasing its capacity. It already has over 20 printers, which makes it the largest set-up in India. Imaginarium aims to offer on-demand parts which will be manufactured in its lean environment, resulting in drastic reduction in timelines. "Apart from 3D Printing, our advance manufacturing services like CNC machining, Tooling divisions keep innovating their manufacturing techniques to give aggressive timelines," he adds.

"Imaginarium seeks to democratize design and manufacturing for brands, businesses and individuals alike through the power of advanced technologies, and will do so in an open, collaborative and community-driven endeavor," sums up Shah. 

The Metamorphosis Café is a customized 3D Printing Experience Zone that can be set up in any institute or organization and comes bundled with easy-to-use 3D printers, scanners, material, software and content.

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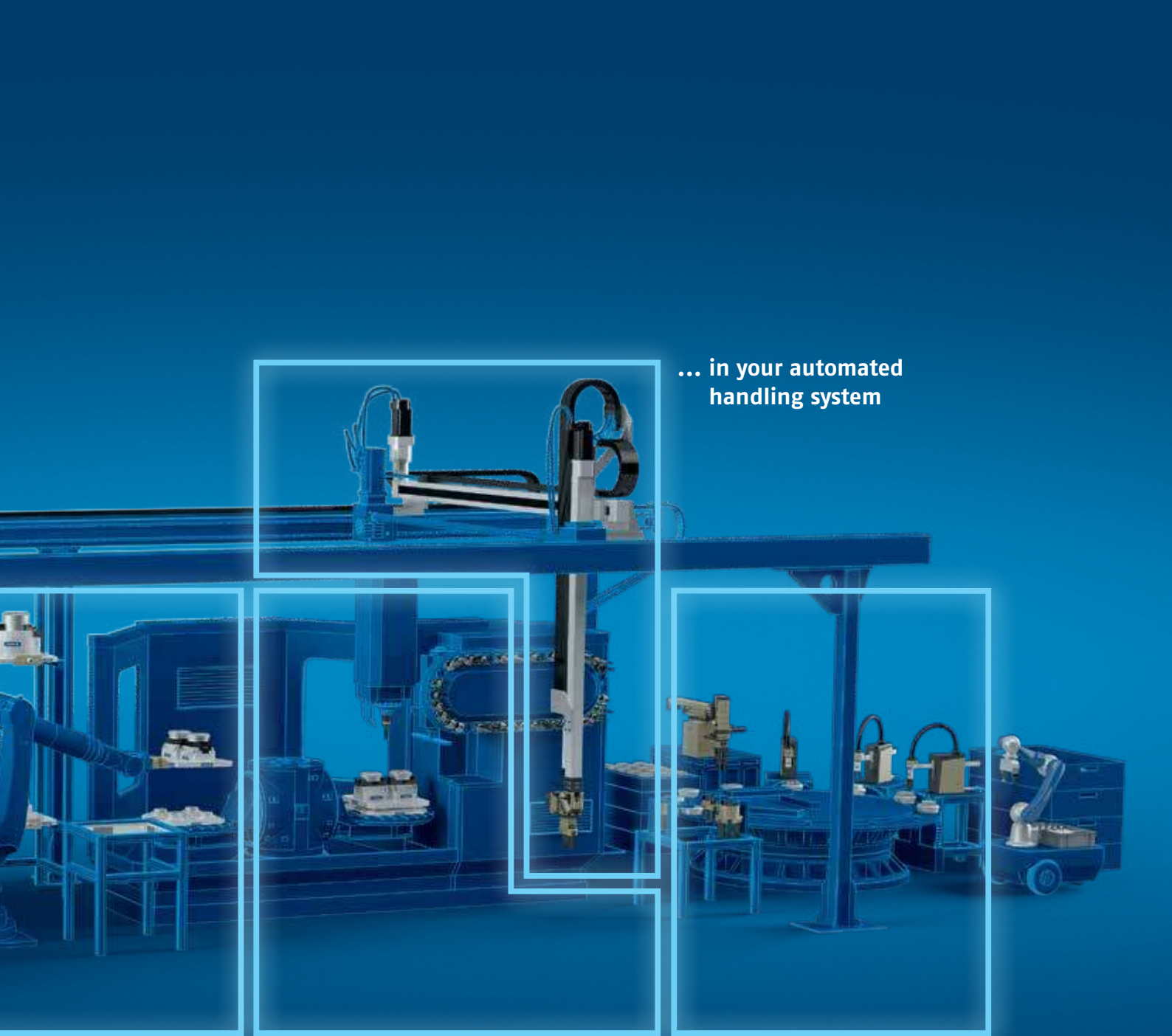
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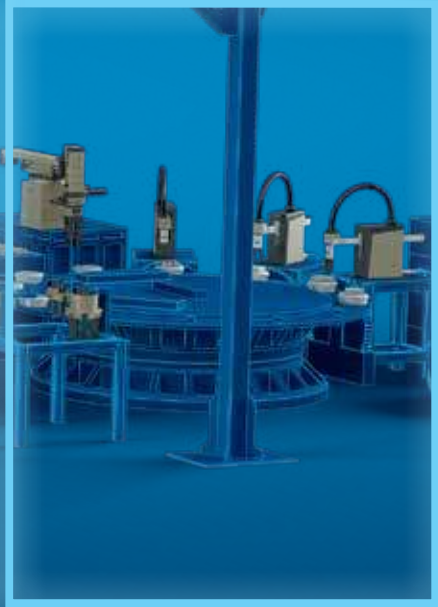
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EXCEEDING THE EXPECTATIONS

Micromatic Grinding met Stanadyne India's requirement of a fuel pump assembly solution with stringent quality parameters by innovatively tweaking its standard offering.



The CLG 5025 (Centerless Grinding Machine)

Source: Micromatic Grinding Technologies Ltd

Stanadyne LLC is a developer and manufacturer of fuel pumps and fuel injectors for diesel and gasoline engines. The company is based in Windsor, Connecticut, with global locations in China, India and Italy. It specializes in fuel injection equipment producing components for gasoline direct injection engines, com-

Source: Micromatic Grinding Technologies Ltd

mon rail systems, electronic and mechanical governed rotary distributor pumps for diesel engines and diesel fuel injectors.

In need of a local solution

The components needed by Stanadyne India Pvt Ltd (SIPL) for fuel pumps and injectors were being sourced from its US manufacturing plant and were made on Cincinnati grinder while adhering to stringent quality parameters.

The company was looking to localize the process. Its requirement, from cost management perspective, was an indigenous Centerless Grinding Machine (CLG):

- with features to set the machine up quickly independent of any operator with specialized skills;
- that could deliver process capability of 1.67 min on roundness (50 UPR) and straightness of 0.635 μm max,

Challenge & Solution

Customer's requirement

Stanadyne India was looking to localize its fuel pump assembly and, hence, required a grinding machine that could meet stringent quality parameters of parts produced on best-in-class imported CLG machines.

MGT's solution

The CLG 5025 (centerless grinding machine) with requisite additions to suit the customer's requirement.

size tolerance 1.27 µm, and Ra 0.1 µm max.

Challenges abound

However, there were various challenges in fulfilling the requirements:

- material variants - bearing steels and stainless steel
- a wide variety of parts - diameters 6 to 9 mm in steps of 0.5 mm
- hollow valves with undercuts/ x holes/milled slots
- the machine would need multiple passes for parts and repeat set ups
- traverse at least 2 m/min
- optimized GW and CW.

MGT's 'Made in India' offer

"Since we could not get any commitment on the process

capability from most of the local and global machine manufacturers who do serious business in the segment, the final plan was to work collaboratively with MGT," says TG Deenabandhu, Senior General Manager, Projects, Stanadyne LLC.

In a rare display of confidence building exercise between MGT and Stanadyne Management, Deenabandhu himself worked with the MGT's Design and Application team to do pre-order trials on an existing Centerless Grinder. He worked with the shop floor personnel to help in the settings of machines and quality inspection for nearly 20 days and suggested many important specification and design changes. Those critical inputs from his years of experience was the real reason for achieving better accuracies even on the proto machine.

Micromatic Grinding thus took up the challenge to develop a solution to meet the required quality parameters, previously seen only in high-cost imported machines.

The company worked on its standard offering, the CLG 5025 with the below additions to suit Stanadyne's requirement:

- 6-axis CNC centerless grinder for high precision and higher productivity;
- Twin support grinding wheel head for higher rigidity;




Source: Micromatic Grinding Technologies Ltd

"This augurs well for new fuel injection products that Stanadyne will be launching over next couple of years."

TG Deenabandhu
Senior General Manager
Projects
Stanadyne LLC

- AC servo motor for regulating spindle drive;
- Regulating spindle with direct drive to reduce vibration level;
- Rotary disc system for grinding wheel dressing.

The SIPL team of S Jayakumar, Divisional Manager, Manufacturing Engineering (ME) and R Sivakumar, Deputy Manager, ME lent an active support with the work holding, grinding process etc. "Deenabandhu and his team's commitment is a unique example of customer-led innovation in MGT's 'Make in India' story," sums up NK Dhand, Chairman, MGT. 

Micromatic Grinding took up the challenge to develop a solution to meet the required quality parameters, previously seen only in high-cost imported machines.

Results Achieved in Plunger

Accuracies Parameter	Required	Achieved
Size Tolerance	± 2.5 Micron	± 1.5 Micron
Roundness	0.635 Micron	< 0.500 Micron
Straightness	0.635 Micron	< 0.500 Micron
Surface Roughness	0.125 Ra	0.1 Ra

Source: Micromatic Grinding Technologies Ltd



Plunger, Delivery Valve, Metering Valve (in that order), which basically are cylindrical rollers used in fuel pump assembly

Source: Micromatic Grinding Technologies Ltd

THE GAME CHANGER IN MANUFACTURING

Emerging as a transformative technology, Augmented Reality (AR) is all set to revolutionize manufacturing processes. Among its rapidly evolving applications, it's interesting to know about FARO's integrated solution Visual Inspect where AR is leveraged for quality inspection.



Source: FARO Technologies

With the integrated camera on the mobile device, an overlay of the as-built object with virtual 3D data, including all process and workflow information, can be realized in real time.

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In the information-driven cyber-physical environment of Industry 4.0, the digital transformation of the manufacturing industry has brought on an interconnection between data, people, processes, services, systems, and produc-

tion assets. With this, the volume, velocity, and variety of data that companies manage has increased exponentially. Known as 'Big Data', this information is crucial for companies looking to implement data-driven strategies to optimize their

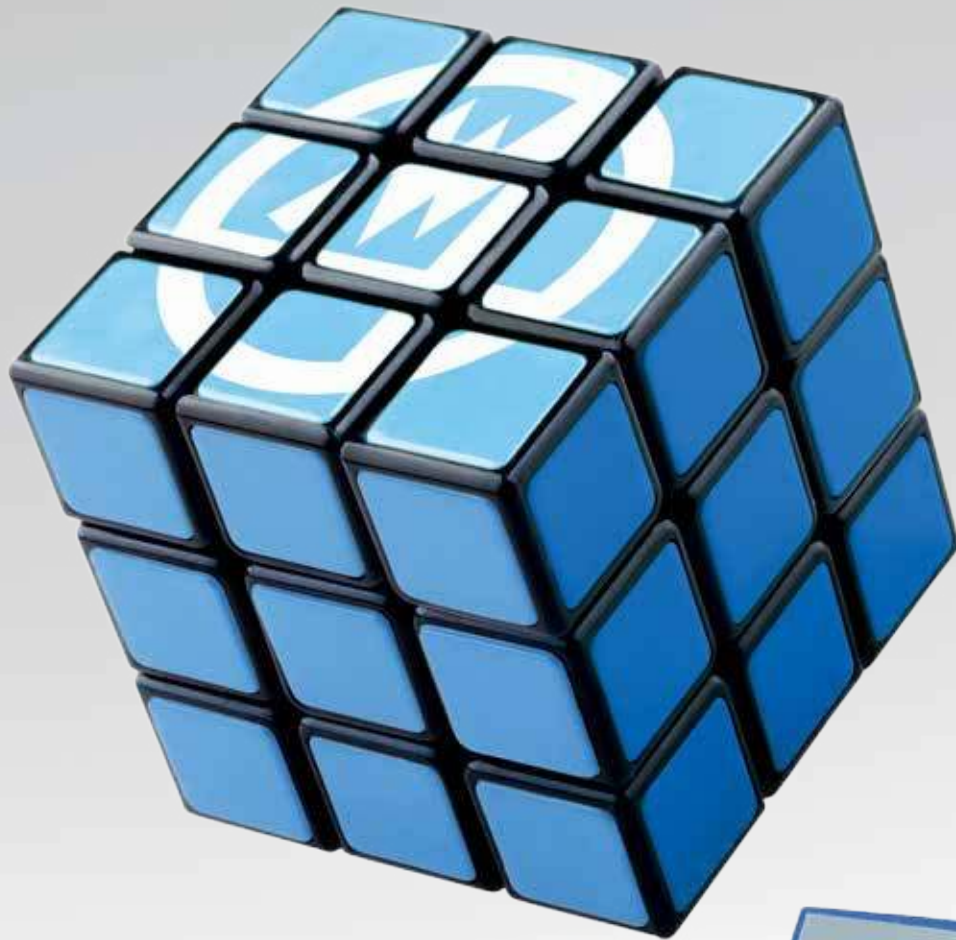
organization's performance and efficiency, or increase their competitiveness. Amidst the excitement and anticipation of potential opportunities that these changes bring, Augmented Reality (AR) has emerged as a transformative technology that is set to revolutionize manufacturing processes. Valued at US\$ 2.39 billion in 2016, the AR market is expected to reach US\$ 61.39 billion by 2023 and the applications of AR has evolved significantly since its introduction.

Transformative technology for everyday uses

AR has many applications in today's society, whether through the use of smart glasses, video and laser projectors, or the overlaying of additional information. Users of AR can experience a new and improved natural environment, where virtual information is used as a tool to provide assistance in everyday activities. This functional aspect of AR, together with improvements in the AR technology, are key factors that have led to a transformation of its uses. In 1992, the first functioning AR system was introduced and used by the US Air Force as a new method for training pilots. Subsequent commercial AR applications were largely concentrated in the entertainment and

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gaming businesses, but with technological advancements in the last decade, other industries are also developing a keen interest in the possibilities of applying AR in their fields.

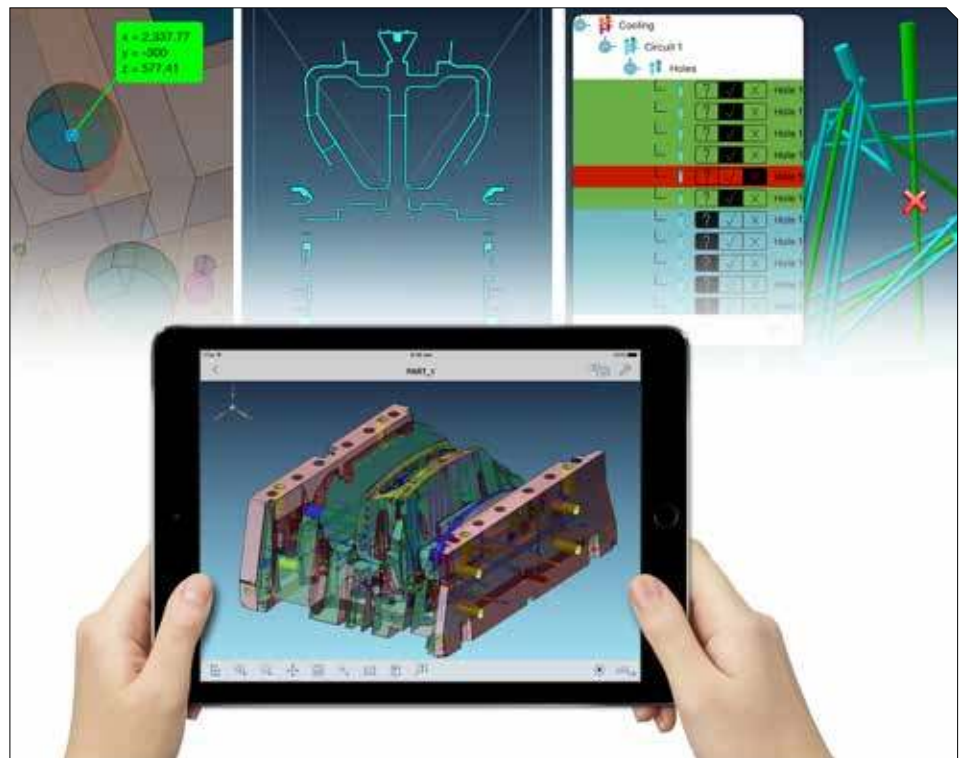
Education, for instance, is an industry that few would expect to see AR employed, but the technology has made learning more exciting for students as they access content by scanning or viewing an image with a mobile device. Another example is an AR helmet for construction workers that displays information about the construction sites.

Augmented Reality for Manufacturing

Globalization has made it possible for worldwide exchange of new technologies, finished goods, and even new ideas. It has also allowed manufacturers the option of expanding their production facilities across borders. To ensure consistent quality across the global process chain, companies need an effective solution that offers them visibility and flexible control over their processes, without incurring too great a cost in terms of personnel, time, and travel.

Within this context, AR technologies can provide considerable added value to manufacturers through enabling direct, intuitive access to information and fast variance inspection, at any time and from anywhere. Processes can also be supported continuously and without disruption throughout the entire process chain.

In fact, the industry has caught on to the use of mobile devices with an integrated camera. An image captured by the camera can be enhanced with additional information of the operator's choice as it is being displayed on the device. A key reason for this method's popularity is in the efficiency it provides – the ac-



Source: FARO Technologies

curacy of the overlay achieved here reduces the time and cost of inspecting components, tools, and production facilities.

In this case, AR is the extension of a model in the production space, connecting virtual reality with the actual product. The exact match between the real and virtual world is ensured with the use of markers. An overlay is created by connecting 3D points on a computer-aided design (CAD) model with 2D points in one corresponding image.

Previously, complex CAD data was not always available across the various functions of a company, and it was challenging to migrate large amounts of industrial data. With the support of AR technologies, it is now possible to share such information with just a tap on a mobile device. The data can also be seamlessly transferred from the device and utilized, streamlin-

FARO's Visual Inspect offers intelligent functions where the user is able to interact with the 3D data to inspect details of interest against 3D data.

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ing the production process. AR can be used in the inspection of parts, dies, and moulds to detect and document errors; in CAD-to-part comparisons to see real-time deviations from nominal data; as well as in component alignment and assembly to see how complex parts should be assembled. In addition, it can be used for quality assurance to inspect incoming parts directly at the delivery point or at the supplier site before delivery.

Application - Complex assembly

Modern manufacturing involves assembling hundreds or thousands of elements in an accurate order, as quickly as possible. This is true regardless of the product type – whether automotive, aerospace, heavy equipment, or ship building – and every new product calls for a new set of assembly instructions.



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Manufacturers rely on assembly drawings as a main means for assembly guidance. An assembly drawing delivers the holistic constructional knowledge of a machine and its separated components, and it is an essential technological file for the technicians to carry out the assembly task and evaluate the end product.

Confined to a 2D drawing, a large amount of information on product components can be quite excessive and cumbersome – making it challenging for engineers to quickly understand the complex assembly relations. The application of AR in complex assembly processes enables technicians to access accurate and up-to-date information for component alignment and assembly swiftly to see how complex parts should be assembled – without the need for complicated 2D drawings.

Application – Quality assurance

Metrology in general, and quality assurance (QA) more specifically, also offer numerous potential applications for AR. AR can be used for final inspection in the production space. Any error in the manufacturing process becomes apparent by directly overlaying the CAD data to the as-built part or assembly that is being inspected. This application is extremely versatile, and it can be used to check that brake lines and flexible parts have been installed correctly, or that single parts have been positioned according to design. It can also be used to verify the completeness of assemblies.

The technicians in charge of quality inspection can take photos of the parts or assemblies on the product, and compare them with supplier-provided or CAD images via an AR overlay. Technicians can easily spot features

that are out of specifications from the overlay, allowing them to identify any issues quickly and intuitively.

Reaping the benefits of AR

Unquestionably, AR promises major benefits for manufacturers. With the integration of AR, processes can be more coordinated, and production can be operated in a lean and structured manner.

AR can provide immersive instructions for technicians in the production space, leading to significant time-savings through improved performance, and cost reduction through the use of lesser resources. AR enables users to visualize product components and allows for quality improvement in training, with a more authentic and sustainable learning experience. Some AR solutions also provide manufacturers with greater mobility and flexibility by introducing mobile solutions, which offers mobile visualization and comparison to real-world conditions. This presents the potential for quality improvement, with earlier error detection in the production or design processes.


Concerns over the cost of adopting AR solutions may keep manufacturers from reaping the benefits it brings. However, some degree of investment is necessary to ensure greater product quality. Top manufacturers place great importance on producing quality products in the most efficient manner, and it is entirely possible to make an informed choice to ensure a positive return on their investment in improving quality.

Manufacturers should decide on a solution that would work best for them by determining the key function for AR integration, before exploring the solutions available. For example, if the main objective is to

provide AR for quality inspection while eradicating the need for paperwork, an integrated solution like the FARO Visual Inspect provides convenience and speed for the user, as it offers a large amount of storage on a single mobile device, with all the files required easily within reach.

The innovative platform offers complex 3D data and augmented reality in all working environments, regardless of time and location, and is also a cost-effective alternative to expensive augmented reality solutions.

Complex CAD data that was previously unavailable throughout a company or on a production line can now be utilized anywhere due to Visual Inspect's powerful translator, which compresses the CAD data to a format suitable for use on the iPad. This enables Visual Inspect to be used for comparison and inspection, allowing users to spot any discrepancies between the CAD model and the physical product – through taking a photograph and overlaying the CAD data, or by using the AR functionality and making comparisons in real-time for deviations. In addition, the data collected can also be used, shared, and analyzed across departments, offering companies opportunities for better collaborations and improved productivity.

Worthwhile investments pay for themselves when it comes to time- and cost-savings in the long run. With the Visual Inspect, FARO offers a whole new solution that meets the needs of a globalized, flexible manufacturing process, and it helps manufacturers streamline their processes to be more flexible and nimble, while taking into account increasing cost pressures. 

Concerns over the cost of adopting AR solutions may keep manufacturers from reaping the benefits it brings. However, some degree of investment is necessary to ensure greater product quality.

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PUNE MACHINE TOOL EXPO 2018	T: +91 (80) 6624 6600 E: info@imtma.in www.mtx.co.in	September 27–30, 2018 Auto Cluster Exhibition Centre Pune, India
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INTERNATIONAL METAL TECHNOLOGY TAIWAN SHOW (iMT)	T: +886 2 2595 4212 E: imt@kaigo.com.tw www.imttaiwan.com	December 05–07, 2018 Taichung International Exhibition Center (TCIEC) Taichung, Taiwan
IMTEX 2019	T: +91 (80) 6624 6600 E: imtma@imtma.in www.imtex.in/imtex2k19_new/ index.php	January 24–30, 2019 Bangalore International Exhibition Centre (BIEC) Bangalore, India
TAIPEI INTERNATIONAL MACHINE TOOL SHOW (TIMTOS) 2019	T: +886 2 2725 5200 E: timtos@taira.org.tw www.timtos.com.tw	March 04–09, 2019 Taipei Nangang Exhibition Center, Taipei, Taiwan
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
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

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A-axis



B-axis



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Reduced non-cutting time thanks to high speed acceleration and rapid traverse rate

- Feedrate (X, Y, Z-axes)

62000 mm/min (2441 IPM)

- Max. acceleration (X, Y, Z-axes)

0.7 G / 1.0 G / 1.5 G

- Spindle acceleration time

1.4 sec (0 → 12000 rpm)

High reliability

- All machine linear motion is in the column to isolate the ball screws from machined chips
- Tools are directly changed to/from the spindle to the tool magazine to ensure high reliability

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Floor space reduced by 36 %
(Compared to other Mazak machines with same size machining area)

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INDUSTRY 4.0: HERALDING A NEW ERA IN MANUFACTURING

To keep Indian manufacturers abreast of the new digital industrial technology of Industry 4.0, VDMA India successfully organized a symposium on “Industry 4.0 - the Future Concept of Manufacturing” on June 6 and June 8, 2018 in Bangalore and Pune respectively.



Source: VDMA India

Dignitaries commencing the VDMA symposium on Industry 4.0 with the traditional lamp lighting.

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World over, across all industries, organizations are waking up to the fact that embracing digitalization and technology is imperative to their success. Aware that lack of digital competence can lead to their loss of competitive ranking, they are keen to stay updated with the latest technology scene.

Hence, with the view to address their need and disseminate information on advanced technologies among the Indian industry players, VDMA India organized the first international

symposium “Industry 4.0 – the Future Concept of Manufacturing” in the cities of Bangalore and Pune.

The event focused on implementing Industry 4.0 in manufacturing sectors such as Automotive, Aerospace, Machine tools, Construction & Material Handling, Food Processing & Packaging, Heavy and Process Engineering. Around 250 delegates comprising industry veterans, policy makers, academia, research institutions, and media from both the cities participated at the symposium.

Industry 4.0 is the way

The Bangalore event was graced by the dignitaries including Chief Guest Margit Hellwig-Boette, Consul General, Federal Republic of Germany, Bangalore; Guest of Honor SR Mukherjee, Chief Executive Officer, TATA Advanced Materials Ltd; Dietmar Goericke, Managing Director, Forum Industrie 4.0, VDMA Frankfurt; and Rajesh Nath, Managing Director, VDMA India.

Industry 4.0, the fourth industrial revolution, has emerged as one of the most dynamic trends in the global manufacturing world, and forms an ideal platform for Indo-German collaboration as Germany leads in manufacturing innovations. Nath, in his welcome address, shed light on the various aspects of Indo-German bilateral relationship and how Industry 4.0 holds the potential to take it to the next level.

He emphasized on the importance of adapting Industry 4.0 to achieve the ambitious target of making India a global hub for manufacturing, design and innovation, and augmenting the share of manufacturing in the country’s GDP from the current 17 percent to 25 percent by 2022.

Since efforts are on to strengthen Germany’s leading role in the field of Industry 4.0, Hellwig-Boette spoke on the technology’s development in Ger-



Source: VDMA India

Audience at the Bangalore and Pune events.

many. Goericke, in his brief presentation, highlighted VDMA's endeavor of supporting the transformation of German mechanical engineering industry by closely coordinating with member companies, research bodies and academic institutions. Stressing similarly on the trend that can turn the manufacturing process upside down, Mukherjee pointed to its significance in the Indian Aerospace industry which currently holds immense potential.

A gathering of bellwethers

The Pune event also gathered visionaries including Chief Guest Andreas Jahn, Vice President - Manufacturing Engineering Planning, Volkswagen India Pvt Ltd; Guest of Honor Rashmi Urdhwareshe, Director, Automotive Research Association of India (ARAI); along with Goericke to put forth their views on Industry 4.0.

Jahn spoke on the application of Industry 4.0 in the Automotive

industry and supported it with a case study of implementing it at Volkswagen India factory at Chakkan. Urdhwareshe made a presentation on the Industry 4.0 initiative by the Government of India and made the audience aware of the activities of the Automotive Research Association of India (ARAI).

Technically speaking

For the technical sessions at both events, speakers from VDMA member companies such as Beckhoff Automation, EPLAN software, HARTING India, Pepperl + Fuchs, Pilz India, SAP India, Shaeffler Group and Zimmer GmbH put forth their take on the topic.

Ajey Phatak, Manager Marketing, Beckhoff Automation Pvt Ltd, made a presentation on 'PC-based Control Technology - Foundation for Industry 4.0'. Umesh Pai B, Managing Director, EPLAN Software and Services Pvt Ltd underlined the importance of creating a digital

twin for every product while implementing Industry 4.0 on the shop floor.

With the aid of case studies, Girish Rao, Managing Director, HARTING India Pvt Ltd, listed the merits of embracing Industry 4.0 in their own production unit in Germany.

Similarly, Ravi Agarwal, Managing Director, Pepperl & Fuchs Factory Automation Pvt Ltd, elaborated on the benefits of automation in the manufacturing sector and how it can be the driving force for realizing the goal of making the country a preferred manufacturing destination for the global companies. Pointing out to the challenges in implementing Industry 4.0, Sanjay Kulkarni, Managing Director, Pilz India Pvt Ltd, highlighted the data safety and security of the systems and the solutions offered by Pilz India.

Ekta Arora, Vice President, IoT and Digital Supply Chain, and Neeraj Athalye, Vice President - Innovation & Digital Business were the speakers from SAP India at Bangalore and Pune respectively. Both spoke on the various initiatives being undertaken for skilling and re-skilling of the workforce needed for the digital transformation.

The day-long symposium concluded with a B2B session, which offered a good networking opportunity for both audience and the participating companies.

Aware that lack of digital competence can lead to their loss of competitive ranking, organizations are keen to stay updated with the latest technology scene.

Industry experts at the dais.



Source: VDMA India

FORGING STRONG BONDS

With the view to aid Taiwan's leading machine tool players share their latest technology solutions with the Indian manufacturers in person, Taiwan External Trade Development Council (TAITRA) recently organized a three-city Taiwan Automobile Manufacturing forum at Delhi, Pune and Chennai as a roadshow. Highlights...

Taiwan Automobile
Manufacturing
forum at Delhi



Source: Taiwan External Trade Development Council (TAITRA)

India's growing car manufacturing and production sector, supported by demographic dividend and growing infrastructure, is a highly lucrative market for the Taiwanese companies. Being the world's 5th and the largest in the car manufacturing and production, the Indian automotive industry seeks more smart manufacturing solutions as modern machine tools and advanced manufacturing technology are playing a highly critical role in the increasingly competitive automotive industry.

This has enabled Taiwanese

companies to step in to fill the gap with their vast experience and expertise in advanced metal processing and manufacturing solutions. The country continues to be the world's 7th largest producer and 4th largest exporter of machine tools.

Taiwan External Trade Development Council (TAITRA) shouldered the responsibility of acquainting key Taiwanese machine tool manufacturers with the Indian manufacturing industry through the three-city forum held at Delhi, Pune and Chennai. The forum, in the form of a roadshow, had leading Taiwan-

ese manufacturers of precision stamping, press machines, CNC machines and grinder machines etc. demonstrate their latest metalworking technologies and share how they can create value-added smart manufacturing solutions for future manufacturing upgrade.

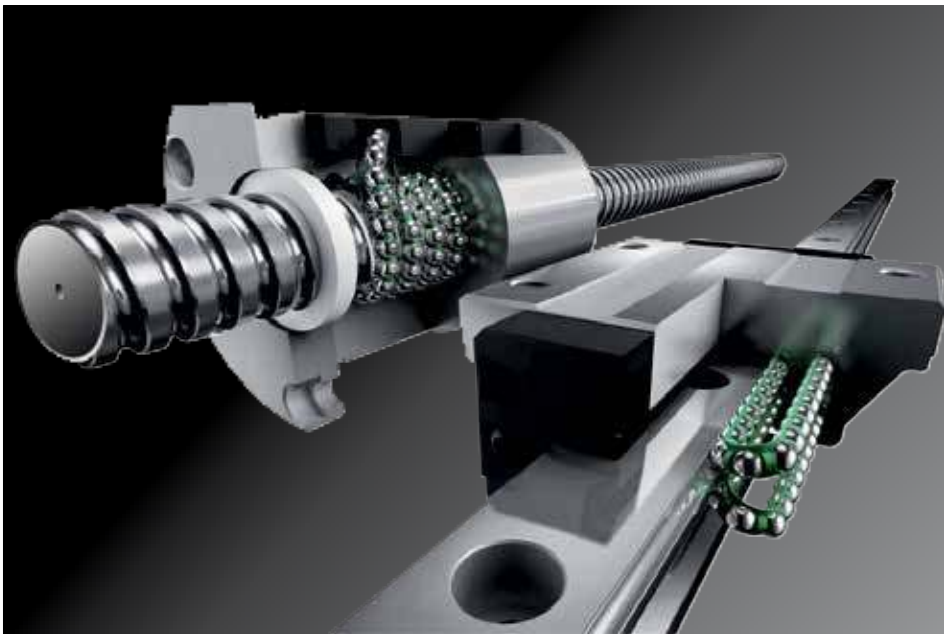
Specialists from Taiwan

Among the ones visiting India were Taiwanese industry stalwarts Tongtai Group, SEYI, FFG, Palmary Machinery, and G-Shank Enterprise.

G-Shank Enterprise, the largest precision stamping company in

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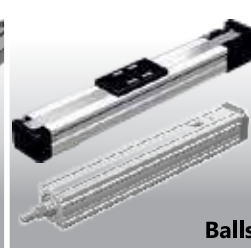
Cam - Roller Follower



Rod End - Link Ball



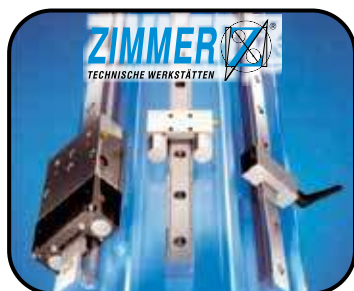
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MUMBAI BANGALORE CHENNAI HYDERABAD AHMEDABAD





Source: Taiwan External Trade Development Council (TAITRA)

Taiwan delegates at the Pune forum explaining the benefits Indian manufacturers can derive through collaboration

Taiwanese companies invited by TAITRA for the three-city Automobile Manufacturing forum:

- G-Shank Enterprise
- Tongtai Group
- SEYI
- Palmary Machinery
- YCM
- FFG


Asia having 45 years of experience and 5000 partners worldwide, showcased its one-stop solution for Die Design, Stamping and Automated Assembly to the Indian audience. Taiwan's top most automotive component solution provider, Tongtai Group presented to the Indian sector its strong engineering capability for providing all types of solutions from SPM to a totally automated production line with complete tool-up machines. SEYI, a leading manufacturer

of medium-large servo presses, showcased its capacities. Palmary Machinery, the largest cutting-edge grinder exporting brand in India from Taiwan, showed its grinding machines with a total solution and was joined by YCM, which specializes in machine tool manufacturing and FFG, world's largest machining center manufacturing group and the largest machine tool group in greater China.

Successful three-city forum

The three-city event, organized to raise awareness regarding the expertise of Taiwanese machine tool manufacturers, received an overwhelming response from the Indian manufacturers looking for innovative solutions to enhance their manufacturing competitiveness in the market. Attended by more than 400 people across New Delhi, Pune

and Chennai, the forum received a massive support from leading Indian car manufacturers such as TATA, Mahindra, Ashok Leyland, etc; tier 1 and tier 3 car manufacturing supplier chain; various industrial associations like SIAM, ACMA, FISME, CII, CMAI, etc., and government bodies like Tamil Nadu Industrial Guidance & Export Promotion Bureau.

Acting as a catalyst in the process of strengthening the bond between Indian manufacturers and suppliers and Taiwanese machine tool industry, the event witnessed Taiwanese delegates giving presentations on their offerings, interacting one on one with the attendees, and explaining their strengths to them. They also expounded on the benefits the Indian manufacturing sector can derive by using Taiwanese machinery. During the roadshow, the Taiwanese delegation had the opportunity to visit some Indian facilities such as Bharat Forge, Munjal Showa, TATA Motors and so on which helped them get acquainted on the requirements of the Indian market. The interest generated towards Taiwanese machinery can be gauged by the fact that each of the Taiwanese delegates are in discussion with six to seven medium- and large-sized potential buyers and are hopeful of a positive result in the second half of the year. 

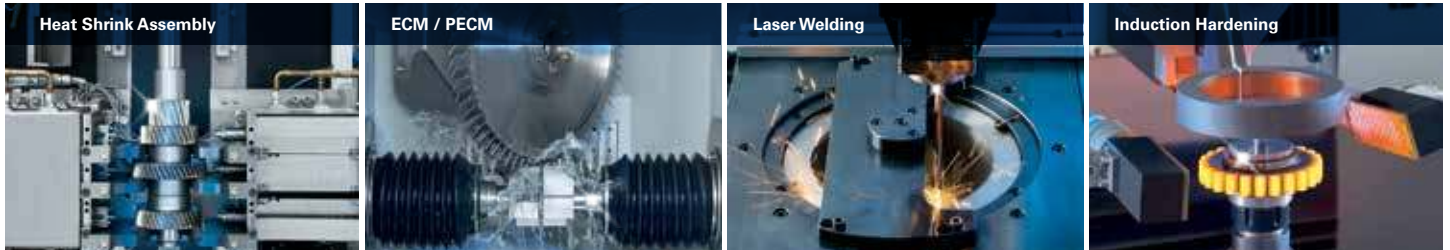
More than 400 people attended the three-city roadshow and interacted with the Taiwanese delegates one on one. The roadshow piqued the interest of the Indian industry resulting in queries from six to seven medium and large potential buyers for each of the Taiwanese delegates.

TAITRA delegates expounding on Taiwanese expertise in machine tools at the Chennai event



Source: Taiwan External Trade Development Council (TAITRA)

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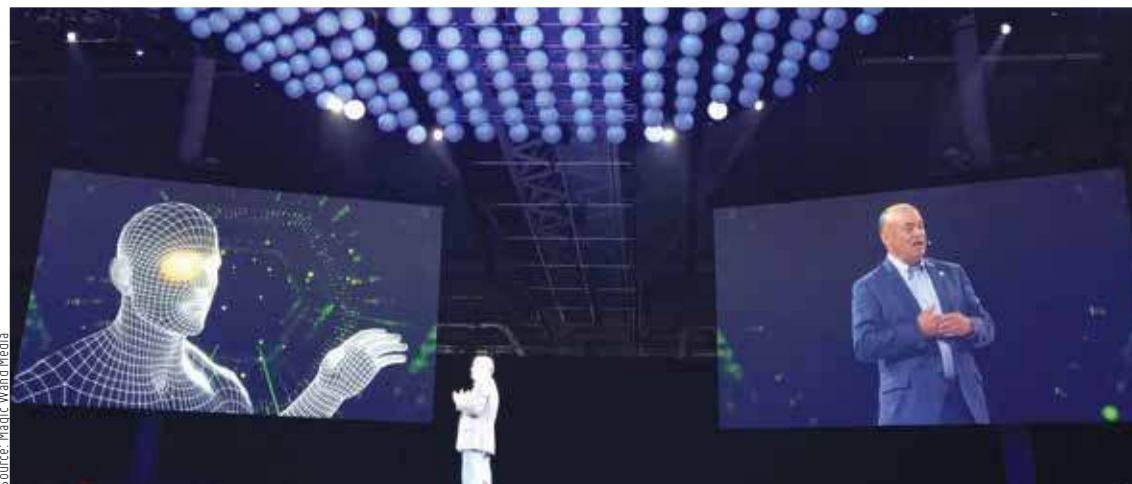


* Compared SW-1-spindle-machine to SW-4-spindle-machine

LiveWorx 2018: MOVING INNOVATION FROM A PLACE TO A PACE

The conglomeration of 6000 innovators from 70 countries, 300 thought leaders, 240 breakout sessions, 120 global press members and more than 100 sponsors and partners morphed into one community of technologists exploring the opportunities created by the convergence of the physical and digital worlds during this year's LiveWorx in Boston.

Jim Heppelmann, President & CEO, PTC addressing the packed-hall audience during the opening ceremony.



Source: Magic Wand Media

LiveWorx Digital Transformation Conference, held from June 17-20, 2018 at Boston Convention and Exhibition Center (BCEC), kicked off with what could aptly be termed as a breathtaking visual treat. Packed with spectacular performances and a surreal blend of sounds and lasers, the

four-day show organized by PTC, was no less than an out of the body experience, leading to a thrilling journey of innovative and disruptive technologies that included augmented reality (AR) / virtual reality (VR), IoT, Industry 4.0, product design, robotics, AI, data security and blockchain.

Place to a Pace

The show was unveiled by Jim Heppelmann, President & CEO, PTC, who explained the connect between this year's theme: "Place to a Pace" and the way a company transcends innovation at the product level embracing the perspective in all aspects of business. He elaborated, "It's how

PTC Senior Executive Members addressing the global media



Source: Magic Wand Media

Praful Kushwaha, Senior Manager, IT Services, Bharat Forge Ltd explaining the benefits of implementing IoT.



Source: Magic Wand Media

A panel discussion of PTC global customers on IoT in progress.



Source: Magic Wand Media

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Source: Magic Wand Media



The X-Factory was a complete, immersive experience highlighting the manufacturing lifecycle, from front office to shop floor.

Top IoT Tips from LiveWorx

- Focus on areas that show immediate business value.
- Deliver quickly to get buy-in from senior management.
- Don't be afraid of the cloud.
- Gain insight into customer experience; Enhance the experience with technology.

we think about our role in the technology universe, how we work with partners, where our headquarters should be, how our business model works, the way we drive technology innovation, how we evolve our culture, even the way we think about security and privacy." Further he added that the Industrial IoT is moving from a 'place to a pace,' as embedded sensors, PTC's software suite, and augmented reality interfaces, such as the HoloLens from PTC partner Microsoft, accelerate the convergence of the physical and digital worlds.

Change, the only constant

In his opening remarks Heppelmann reinforced, "To compete

and succeed today, companies and their employees need to embrace a 'constant state of change.' We need a mindset where clock speeds are short, innovation is continuous, and where a willingness to react quickly and change frequently is viewed as a core competency." He then quipped that the PTC acronym could actually stand for 'prepare to change.'

Partnerships create value

If embracing fast-paced change was reiterated as a must to success, partnering with other industry leaders was a major buzz at LiveWorx. Speaking of company partnerships and how they are critical to tech innovation, Heppelmann said, "No one company can do it alone."

The event was a witness to several major partner announcements. PTC announced its collaboration with ANSYS, the global leader in engineering simulation for working together to integrate ANSYS' Discovery Live real-time simulation capabilities into PTC's Creo® design software, enabling engineers to immediately see implications of every design change they make. Against this backdrop, Ajei Gopal, President & CEO, ANSYS, said, "We believe it's the only way to develop the products of the future."

A major strategic agreement between PTC and Rockwell Automation was announced where Rockwell Automation will make




Source: Magic Wand Media

Kalyan Sridhar, Vice President & Country Manager, PTC (first from left) along with customers from India during LiveWorx 2018.

a US\$ 1 billion equity investment in PTC, and the companies will align their respective smart factory technologies. Blake Moret, Rockwell Automation Chairman & CEO, said, "Customers were asking us to do this. They know that when they combine IT and OT data they can use analytics to both optimize processes and to prevent unexpected downtime." The show also served as an apt platform for PTC and Microsoft to discuss the expansion of their strategic relationship. More than 100 partners and sponsors took part in LiveWorx 2018 such as Accenture, Capgemini, Deloitte Digital, Infosys, Cognizant, Hewlett Packard Enterprise (HPE), Larsen & Toubro Infotech (LTI), Microsoft, and Tech Mahindra.

Tech playground

LiveWorx 2018 featured both stage and show floor, with more than 85 exhibitors offering a catalytic marketplace of ideas and solutions built for the outer limits of digital transformation and product development. PTC partners also collaborated on X-Factory, an immersive, highly interactive digital thread and Industry 4.0 experience demonstrating how they change the way humans and machines interact in a manufacturing environment. The show was a testimony to the fact that engraining innovation in the company culture is the way to success. 

The next edition of LiveWorx is scheduled to take place from June 10-13, 2019 in Boston. To be part of this global technology conference register on liveworx19.smarteventscloud.com/portalnewreg.wv

ACMEE 2018: A CELEBRATION OF MANUFACTURING

ACMEE, the international exhibition on machine tools, continues raising its bar as its 13th edition turned out to be an unprecedented success. From an unlimited spread of exhibitor offerings to the number of visitors who flocked to savor it, the biennial event was truly a festival of innovations in manufacturing technologies. Highlights...

Eminent industry veterans flagging off ACMEE 2018 with the traditional lamp lighting ceremony.



Source: AIEMA

Organized by Ambattur Industrial Estate Manufacturers Association (AIEMA), the current edition of ACMEE, held at Chennai Trade Center, Chennai from June 21 - 25, 2018, was an out-and-out success.

ACMEE, one of the biggest shows in the country on machine tools, has been playing a crucial role of extending its platform to machine tool players from world over to unveil their latest in technological innovations. The latest event exceeded the industry's expectations from it with its emphasis on Industrial Automation

to facilitate local players' move towards Smart Manufacturing, which is the order of the day.

Statistically speaking

The event that sprawled over an area of 10,050 sq mt hosted 480 exhibitor companies and attracted an awe-inspiring 43,500 visitors. On the spot business generated at the event is estimated to be at ₹450 crore. Many exhibitors have reported on the spot sale, which is an interesting trend and a direct indicator of the upward trends in industrial production. The fact that 99 percent of the participants are keen to be part of

ACMEE 2020 points to the business opportunities facilitated by ACMEE 2018.

The show had an impressive global participation with 150 exhibiting companies hailing from 27 countries. And, under ACMEE's international buyer visit program, four buyers from Sri Lanka also visited the event.

The grand beginning

The five-day machine tools affair commenced with the traditional lighting of the lamp by the Chief Guest Shri Suresh Prabhu, Hon'ble Minister of Commerce & Industry and Civil

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Source: Magic Wand Media

“We will achieve the dream of India with the help of the private sector. India deserves to be better than what we are today and that is possible only through economic activities at which the private sector is good at.”

Shri Suresh Prabhu
Hon'ble Minister of Commerce & Industry and Civil Aviation
Government of India

Aviation, Government of India, in the presence of other dignitaries including Thiru O Panneerselvam, Hon'ble Deputy Chief Minister, Government of Tamil Nadu; Thiru P Benjamin, Hon'ble Minister for Rural Industries, Government of Tamil Nadu; and Thiru MC Sampath, Hon'ble Minister for Industries, Government of Tamil Nadu.

Also gracing the occasion were ACMEE 2018 sponsors including Satish Sadasivan, Managing Director, Schunk Intec India Pvt Ltd; P Ramadas, Managing Director, ACE Manufacturing Systems Ltd & President, IMTMA; R Ganesan, Managing Director, Mahr Metrology India Pvt Ltd; along with the eminent members of AIEMA and the organizing committee of ACMEE 2018.

Vision ACMEE 2020

Optimism loomed large as the prominent industry veterans flagged off the event. Their overview on the current state of the industry and its imminent opportunities set a perfect mood, rendering the event the start it deserved.

In his welcome address, D Ravi, President, AIEMA, thanked the Government of India and the



Source: ACMEE

“With the support of honorable ministers, we look forward to a much-needed Multi-level Convention Center in Chennai to make ACMEE 2020 much bigger than what it is today.”

K Ayyappan
Chairman
ACMEE 2018

Government of Tamil Nadu for their focus on improving infrastructure of Ambattur Industrial Estate, ease of doing business and continued support to AIEMA. K Ayyappan, Chairman, ACMEE 2018, seconded his request of augmenting the exhibition infrastructure.

Growth of SMEs is the key

Prabhu lauded AIEMA's efforts of offering SMEs the opportunity to be updated with the technological advancements of the world. He spoke on the Government of India's policies on the growth of SMEs and stressed on the growth of GDP at the district level, which will scale up to the national level.

Thiru O Panneerselvam stressed on the importance of machine tools in the growth of the manufacturing industry. “Machine Tools form the basis of manufacturing. Hence, ACMEE is important as it spreads awareness on the latest in the technologies. The local manufacturers must leverage the opportunity offered to them to rise up to global standards,” he said.

Taking pride in the state's reputed as a highly preferred investment destination, Thi-



Source: ACMEE

“ACMEE is now in the league of leading international events on Machine Tools. Keeping this in view, accreditation of UFI, the Global Association of Exhibition Industry has been sought. Their Auditors have also made a fact finding study on the systems in place, facilities, area covered, number of visitors and exhibitors etc. We hope to get the UFI accreditation shortly.”

RSS Satish Babu
Convenor
ACMEE 2018

ru Benjamin said, “To progress further, upliftment of the SME sector is highly crucial for which the Government of Tamil Nadu is continuously resorting to various policies and support schemes. AIEMA through ACMEE is supporting us in our endeavor.”

Thiru MC Sampath highlighted the various subsidiaries by the Government of Tamil Nadu to facilitate the growth of SMEs and the efforts to strengthen the aerospace and defense industry. He congratulated AIEMA for bringing in global technologies at the doorsteps of local manufacturers and SMEs through ACMEE.

SAP team in a technical session on its SAP S/4/HANA Cloud.



Source: Magic Wand Media

On the spot business generated at ACMEE 2018 is estimated to be at ₹450 crore. Many exhibitors have reported on the spot sale, which is an interesting trend and a direct indicator of the upward trends in industrial production.



Source: Magic Wand Media

Exhibitors' rave reviews

Once an ACMEE exhibitor, always an ACMEE exhibitor. Hence, most exhibitors at ACMEE are regulars who find the platform just apt to showcase their innovations:

S&T Machinery (STM) Pvt Ltd has been regularly taking part in ACMEE shows. "One of the most important features of participating in ACMEE is that it helps in creating brand proximity. Once the customers develop a sense of brand closeness, they automatically connect with our brand," stated D Shanmugasundaram, Managing Director, STM. Meiban Engineering Technologies Pvt Ltd is also a familiar face at the event. "ACMEE is an opportunity to connect with the right visitors and meet other manufacturers in similar activities," stated AV Srinivasan, CEO, Meiban Engineering Technologies. The company displayed its new MW120 Twin Spindle CNC Chucker machine which makes for an ideal solution for

S&T Machinery team at its booth at ACMEE 2018



Source: Magic Wand Media

cutting applications.

According to Indraneel Bhatnacharya, VP, Sales & Marketing Machine Tools Division, Lakshmi Machine Works Ltd, "At ACMEE, our agenda has been to increase our reach to customers." It displayed its newly launched CNC lathe - Starturn with Fanuc CNC system and JV 80 and JV 40 VMCs from its JV series at the expo.

New launches that hogged the limelight

SCHUNK Intec India Pvt Ltd stole the show with its human-robot collaborative innovation, Co-act EGP-C Collaborative Gripping System, which has been created in close co-operation with Universal Robots. "With collaborative automation, robots can now do the toll-taking manual jobs, while the operators can do the simple things that need human intervention," said Satish Sadasivan, Managing Director, SCHUNK Intec India.

Mitsubishi Electric India (MEI) Pvt Ltd announced its new NC Series 'E80' targeted at parts cutting VMCs and lathes for the first time in India at the expo. According to Shuhei Matsui, General Manager - CNC

Systems, MEI, it is an easy adoption from the previous version E70 since the external dimensions remain the same with new added functions such as interactive programming functions.

Mahr Metrology India Pvt Ltd exhibited its innovative measurement systems rolled out by its parent company Mahr GmbH. "Our new devices are optimized to accelerate the measurement process and simplify handling," shared R Ganesan, Managing Director, Mahr Metrology India Pvt Ltd.

For K Ganapathi Subramanian, Vice President - Marketing & Sales, Gedee Weiler Pvt Ltd, "The response we receive at ACMEE become the impetus for our R&D initiatives and plans for new product development." The company showed its latest offerings including Flex Turn with Automation, Unturn 300HD TM with Live tool turret, Lean Turn with special hydraulic tool heads and high precision manual lathe. 

Taiwan External Trade Development Council (TAITRA) organized Taiwan country pavilion.



Source: Magic Wand Media

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GROWING BY LEAPS AND BOUNDS

MTA Vietnam has every reason to be titled as the country's most comprehensive trade fair for showcasing the finest in precision engineering, machine tools and metalworking. Situated against the background of historical and cultural attractions of Ho Chi Minh City, the Saigon Exhibition & Convention Centre (SECC) housed this year's edition from July 03 - 06, 2018, and played a gracious host to trade enthusiasts flocking from world over. Glimpses follow...

Glimpses from the recently held MTA Vietnam 2018 show



Source: Magic Wand Media

MTA Vietnam is well-known for being a perfect platform for connecting manufacturers and end-users. It played to its reputation this year too

Joseph Wu, Sales Manager, Benign Enterprise Co., Ltd at the company booth



Source: Magic Wand Media

with 383 exhibitors luring in 11,131 trade visitors from different parts of the world. According to BT Tee, General Manager, UBM Vietnam, the organizer, this amounts to a positive in-

Faisal Siddiqui, Assistant Manager - Exports, Birla Precision Technologies Ltd (first from left) with his senior colleagues at the stall



Source: Magic Wand Media

crease of 7.05 percent from its previous edition.

International response

The sprawling 12,500 sq mt of exhibition area housed an im-

Amit Salunkhe, General Manager - Sales, India & South East Asia, Zoller India Pvt Ltd at the company's booth



Source: Magic Wand Media

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Source: Magic Wand Media

From L-R: BT Tee, General Manager, UBM VES; Koji Takimoto, JETRO-Ho Chi Minh; and Jean-Pierre Neuhaus, Head of Corporate Communications, Bystronic Group post press conference

pressive international participation. Out of the total number of exhibitors, 70 percent comprised of overseas players from 16 countries and 13 international group pavilions from Germany, Japan, South Korea, Singapore, Taiwan, Thailand and the United Kingdom.

Co-located with events such as Automation Vietnam 2018, Metrology Vietnam 2018, ToolTec Vietnam 2018, WeldTech Vietnam 2018, the four-day MTA Vietnam 2018 witnessed the presence of around 400 group delegations from several associations such as Investment and Trade Promotion Centre (ITPC), Ho Chi Minh City Association of Mechanical - Electrical Enter-

prise, and companies including Allied Technologies, Chieng Shyong Vietnam, Mitsuei Vietnam, GD Battery Vietnam, Bao Bao, and Mitsuba.

Organizer's and exhibitors' take

Impressed with the turnaround, Tee shared, "We have seen a prominent increase in buyer groups visiting the show, which is a testament of our improving brand awareness and market reach."


In alignment, Amit Salunkhe, General Manager - Sales, India & South East Asia, Zoller India Pvt Ltd, shared his experience on participating in the show consecutively for the last three years. "We have seen a gradu-

al increase in visitors since our first participation and are overwhelmed with the visitors' response in this edition. We look forward to converting the generated leads into business. Most of the visitors who dropped by our booth were from the die and mould sector, automotive part manufactures and tool makers." Faisal Siddiqui, Assistant Manager - International Sales & Marketing, Birla Precision Technologies Ltd, had a similar view: "Vietnam is a new market for us hence participating in the show helped us create our brand awareness in this marketplace. Many prospective buyers and distributors from automotive, shipping, mining and fabrication industries visited our stall. Since Vietnam is a developing market and the potential is huge, we are quite optimistic."

Acting as a catalyst

Aside from several products and solutions at display ranging from laser technology, CNC machines, Industry 4.0, 3D Printing, Surface coating, Tool holding and so on, the show was packed with concurrent educational programs and technical seminars, gathering more than 260 delegates and industry experts under one roof. It also served as a networking platform for industry experts and academia to exchange innovation and business ideas.

See you at MTA Vietnam 2019

The 2018 edition being such a success, the jubilant Tee is looking forward to MTA Vietnam 2019 to exceed it. "We will continue striving to improve and reaching out to new educational partners to enrich our co-located seminars and conference programs. Let's hope to return back with a bigger and better version of the show," he concludes on a high note. 

The next edition of MTA Vietnam is scheduled to be held from July 02-05, 2019 at SECC.

Rizza Echarri, Marketing Manager, Bystronic Pte.Ltd (fourth from left) along with her team at the stall



Source: Magic Wand Media

TOWARDS IMPROVED PRODUCTIVITY

With the view to help Indian companies improve productivity and achieve competitive advantage in the current turbulent environment, Indian Machine Tool Manufacturers' Association (IMTMA) is organizing the 12th edition of National Productivity Summit 2018 on August 24-25, 2018 at ITC Grand Chola, Chennai.

A glimpse from National Productivity Summit 2017 that was held in Pune.



Source: Magic Wand Media

Companies, in their pursuit of manufacturing excellence, are constantly seeking measures to attain enhanced competitiveness. To this end, they work towards cost reduction and improved productivity, keep tabs on emerging technologies, bring in paradigm shifts in operations and resort to an integrated approach to innovation in order to achieve sustainable growth. Manufacturing being an ever-evolving industry, manufacturers constantly find themselves grappling with issues they have never encountered before. Hence, through National Productivity Summit (NPS),

that is held every year, IMTMA has taken up upon itself to aid the industry players zero in on the best practices to address the concerns they come across on their way to achieve enhanced productivity and improved competitiveness.

What's in store at NPS 2018

The summit, each year, gathers the highest performing companies to illustrate their proven best strategies in the form of live case studies presentations, industry visits, success stories, and edifying key notes.

The summit this year will be graced by the presence of MM Murugappan, Executive Chair-

man, Murugappa Group, as its Chief Guest. As is the tradition of the event, it will be action-packed with the experts doling out their tested practices and experienced insight to the attendees for producing significant performance effects.

While Dr V Sumantran, Independent Director, UCAL Fuel Systems, will speak on the 'Impact of Productivity on India's Manufacturing Competitiveness', a '360° perspective on Manufacturing Competitiveness' will be presented by AK Taneja, Managing Director & CEO, Shriram Pistons & Rings. The way to 'Drive Growth through Productivity' will be

Source: IMTMA

Witness innovations and best practices in manufacturing



National Productivity Summit 2018

"Showcasing Competitiveness in Manufacturing"
24 - 25 August 2018, ITC Grand Chola, Chennai



To champion the cause of Productivity and enhancing competitiveness in the Indian manufacturing industry, Indian Machine Tool Manufacturers' Association (IMTMA) is organizing the 12th edition of National Productivity Summit on 24-25 August 2018 at Chennai. The event showcases best practices in manufacturing through Inspiring Keynotes, Live Case Study Presentations, Plant Visits, Success Stories and so on.

Enriching Keynote Sessions

Learn from industry leaders who will share their knowledge and expertise on various facets of manufacturing competitiveness.



"Manufacturing Competitiveness - A 360° perspective"

Mr. A.K. Taneja,
Managing Director & CEO,
Shriram Pistons & Rings



"Driving growth through Productivity"

Mr. V.N. Vijayaraghavan,
Managing Director, IM Gears



"IoT implementation in Indian manufacturing – The way ahead"

Mr. Dattatri Salagame, Vice President & Head of
Digital Business, Robert Bosch Engineering &
Business Solutions



"Innovative ways of improving paint shop productivity with positive impact on sustainability"

Mr. Abhay Dixit,
Senior General Manager, Mahindra & Mahindra,
Farm Equipment Sector

IMTMA – ACE Micromatic Productivity Championship Awards 2018

Live case study presentations on best productivity practices from renowned companies



Plant Visits (23 August 2018)

Leading manufacturing companies open their doors to participants on 23 August 2018 to showcase best manufacturing practices and productivity improvements on their shop floor.



TOUR A : Royal Enfield & Rane Madras

TOUR B : Brakes India & UCAL Fuel Systems

TOUR C : Bonfiglioli Transmission & Super Auto Forge



Register your participation NOW !

Registration for participation must be made online only. To register online, log on to www.productivity.imtma.in

For event details or any queries / clarifications during 'Online Registration' process, please contact

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Plant visits of the companies	Products Manufactured
Royal Enfield	Motorcycles
Rane Madras	Steering & Suspension Systems
Brakes India	Braking Systems and associated parts
UCAL Fuel Systems	Fuel Management Systems
Bonfiglioli Transmission	Gear Motors
Super Auto Forge	Warm & Cold Forging components

shown by VN Vijayaraghavan, Managing Director, IM Gears, and Dattatri Salagame, Vice President & Head of Digital Business, Robert Bosch Engineering & Business Solutions, will offer his take on 'IoT implementation in Indian manufacturing'. Last but not least, Abhay Dixit, Senior General Manager, Mahindra & Mahindra, Farm Equipment Sector, will list 'Innovative Ways of Improving Paint Shop Productivity'.

Edifying plant tours

Plant tours are valuable. There is a slew of benefits one can reap by seeing a factory firsthand. The myriad observations one make while touring a plant and witnessing its best manufacturing practices and productivity improvements on their shop floors make for a rich learning experience which can be put into effective use by replicating them in one's own operations.

Solutions abound

The highly dynamic manufacturing world is infamous for posing unprecedented problems. However, the successful companies in the field refuse to let these block their momentum. Having mastered the art of working around the problems, they are

making their way to the summit to enlighten the audience with the aid of live case study presentations on their best productivity practices. A few of them include: **Hero Motocorp, Haridwar**, would be sharing how it went about standardizing the Die design for different models, thereby eliminating set-up time. Low pressure Die Casting is a common process used in volume production in the automotive industry. **Bajaj Auto, Akurdi**, will share the types of challenges it faced in increasing the cavities when the volume rose and how it addressed them by intelligent design thinking. While **L&T MHPS Turbine Generators, Surat**, will be elaborating on what enabled it to overcome capacity constraints in Blade manufacturing, leading to process optimization, **L&T MHPS Boilers, Surat**, will talk about its custom designed Turn Mill machine for machining critical components to reduce throughput time. **Mahindra & Mahindra, Foundry Division, Kandivali**, will present its case study on a frugal automation in Vent Poking process for high pressure moulding line that led to enhanced quality output, lowered costs, and also safe and ergonomic work environment.


Toyota Kirloskar Auto Parts, Bangalore will reveal how it accomplished the remarkable feat of modifying 165 running machines in less than six months to develop components of diesel version vehicles on the manufacturing line of petrol version vehicles.

In **TVS Motor Company, Hosur**, frame welding of motor cycles was a totally manual process due to its complexity, distortion and heat affected zones. The company will share how it made it possible to shift to a fully automated 100 percent robotic one in its case study.

The summit, through the IMTMA - ACE MICROMATIC Productivity Championship Awards 2018, will reward outstanding efforts from the short-listed case studies of companies that have excelled in achieving superior performance. Cash awards worth ₹10 lakh will be presented to the winners.

A must-attend affair

With industry experts shedding light on the practices they execute in their presentations and case studies, NPS 2018 promises to be an ideal learning ground. And while the interactive sessions and networking will usher in a fresh perspective, plant tours to the renowned companies will help gain an insight into their effective shop floor practices.

Hence, CEOs, top management executives, senior executives, engineers, R&D specialists and industry consultants from manufacturing industries from Automotive, Auto components, Consumer durables, Machine tool, Tool rooms, Aerospace, Defence, Railway units, PSUs, General engineering and other discrete manufacturing industries should participate in the event and make the most of the takeaways. 

Three plant visits have been planned to leading manufacturing companies prior to the summit on August 23, 2018.

Tour A: Royal Enfield & Rane Madras
Tour B: Brakes India & UCAL Fuel Systems
Tour C: Bonfiglioli Transmission & Super Auto Forge

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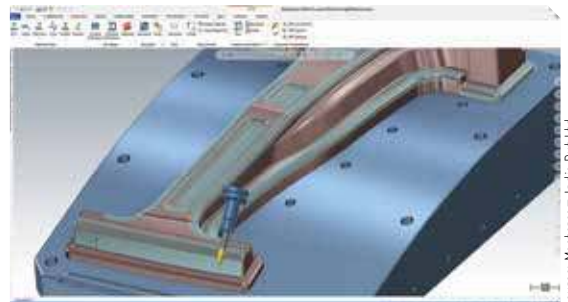
CAD/CAM Software

CNC Software, Inc. Releases Mastercam 2019

Mastercam 2019 increases machining productivity and reduces overall production costs with new 2D through multi-axis milling automation features, CAD and model preparation improvements, expanded 3D tooling, Accelerated Finishing, and powerful Turning and Mill-Turn enhancements.

CNC Software, Inc., developer of Mastercam, the world's leading CAD/CAM software, has announced the release of Mastercam 2019 which has been developed to streamline the manufacturing process from job set-up to job completion.

- **CNC Programming:** Mastercam 2019 continues to increase productivity and programming efficiency, while reducing overall production costs, with a series of automated 2D through 5-axis toolpath improvements. Re-engineered chamfering and hole-making strategies, plus the new Multi-axis deburring provide new levels of time-saving automation and simplicity.
- **Job Preparation and Set-up:** The latest software increases efficiency and reduces job set-up time and the preparation needed for part machining and programming. This includes enhanced CAD functionality and 3D model import support, improved part preparation and fixture set-up tools, additional PowerSurface capabilities, and expanded support for Model-Based Definition (MBD).
- **Tool Support:** Mastercam 2019's expanded digital tool library capability delivers accurate, 3D tool assembly models, with access to the latest cutting tool technology and updates for Sandvik Coromant CoroPlus and MachiningCloud platforms.
- **Validation:** With improvements to toolpath and machine simulation, toolpath graphics, and other verification and analysis tools, Mastercam 2019 provides greater programming assurance and allows for better, more informed decisions before a job is run. These improvements include support for block drilling multiple holes simultaneously and better axis control in simulation, allowing you to easily check machine limits or collision checking.
- **Job Management and Documentation:** Mastercam 2019 also improves job documentation and management, while helping to address quality and certification initiatives.



Source: Mastercam India Pvt Ltd

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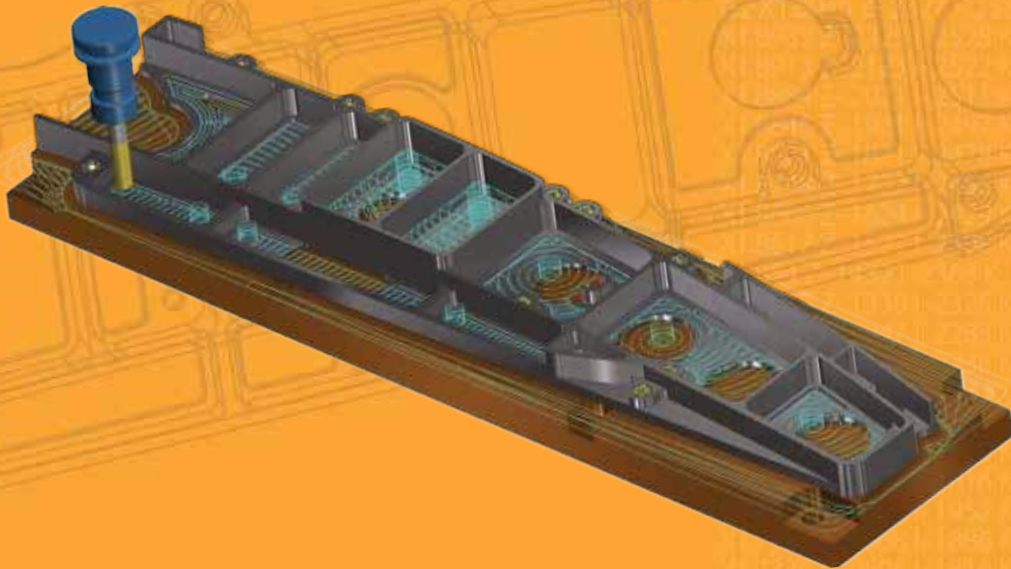
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